Comparison of Injury-Tracking Programs

Geof Manzo[1] and L. Tyler Wadsworth[2]

[1]Gateway Grizzlies Baseball Club, Center for Orthopedic Surgery & Sports Medicine, Belleville, IL; [2]Department of Community and Family Medicine, Saint Louis University School of Medicine, Primary Care Sports Medicine Fellowship, Center for Orthopedic Surgery & Sports Medicine, Belleville, IL

MANZO, G. and L.T. WADSWORTH. Comparison of injury-tracking programs. *Curr. Sports Med. Rep.*, Vol. 7, No. 6, pp. 338–342, 2008. *Injury-tracking software is becoming a necessity in the athletic training room to organize care and meet requirements for record-keeping. A variety of competing products is available, including workstation, local network, and Internet-based programs. Most of these systems are commercially available, while the NCAA Internet-based system is available for member institutions at no cost. A few of the injury-tracking systems have gained wider use and are reviewed here.*

INTRODUCTION

As the field of sports medicine has grown, increasingly sophisticated care has become available to the athlete in the training room setting. A variety of medical providers contribute to the daily care of athletes, including primary care sports medicine specialists, orthopedic surgeons, certified athletic trainers, physical therapists, chiropractors, and dentists. Often, members of the sports medicine team other than certified athletic trainers provide care in the training room. Whether the athlete is an amateur or professional, the care provided must be documented, and the type of injury with surrounding circumstances can be tracked. A written record can be tedious and painstaking to complete, difficult to use for injury tracking and trends, and often takes providers away from what they enjoy most: caring for athletes. Transportation of paper records is cumbersome, so they typically are not available when teams travel. Electronic records have the advantage of portability, and if Web-based, accessibility from multiple locations. The purpose of this article is to familiarize sports medicine providers with several of the electronic injury-tracking systems that currently are available. Many products exist on the market today to assist the sports medicine staff with information management. Some products are intended to be installed on a computer network or workstation; others are Internet-based and require Internet access to view, edit, and create records. Some function as a complete medical record, while others are injury-tracking tools.

Standardization of the type and quantity of data can provide an opportunity for review and statistical analysis across multiple teams, conferences, and leagues, potentially leading to improved sport safety. Standardization of injury types and defined injury exposures can allow comparison of injury patterns across different sports. While there is consistency within a product line, there is a wide range of specific data that the competing products are designed to record. All of the products reviewed here allow the users to track multiple teams, which is essential for college and high school settings that offer multiple sports during the course of a school year. The available features and pricing structure vary among competing products, with some offering a menu of choices that expand both the capability and cost of the record-keeping system. The Table provides a comparison of some important individual product features and available pricing information.

A detailed, comprehensive health record is necessary to keep all members of the sports medicine staff up-to-date on all athletes in the program. The type of record-keeping an institution uses is based upon their philosophy, budget, and available technology. Inexpensive, less feature-rich programs may be adequate for the small organization with basic needs and a limited budget, but larger organizations with multiple teams and athletic trainers may opt for more powerful programs. High schools rarely have the resources to maintain a comprehensive database of the athletes' health care information. A small, independent league professional

TABLE. Comparison of injury-tracking software.

	SportsWare	Simtrack	SIMS	NCAA	Presagia Sports
Company	CSMI	Premier Software	Flantech	NCAA	Presagia
System	Software	Software	Software	Web-based	Web-based
Demographics	Yes	Yes	Yes	Yes	Yes
Injury report	Yes	Yes	Yes	Yes	Yes[a]
Treatment reports	Yes	Yes	Yes	Yes	Yes[a]
Progress notes	Yes	Yes	Yes	Yes	Yes[a]
Medication log	Yes	Yes	Yes	No	Yes[a]
Physician referral	Yes	Yes	Yes	No	Yes[a]
Report generating	Yes	Yes	Yes	Yes	Yes[a]
Insurance information	Yes	Yes	Yes	No	Yes[a]
Insurance claims	Paper[a]	No	No	No	No
Calendar	Yes	Yes	Yes	Yes	Yes[a]
Exercise flowsheet	No	Yes	No	No	Yes[a]
Price	$200–$3000	$600–$3000	$595	Free	Variable
Annual fee	$150	$150–$750	$249–$599	No	Variable

[a]Requires optional module.

team with a high turnover of players may not have interest in maintaining a comprehensive health record on their athletes. Major professional teams and NCAA Division I schools with greater resources and investment in their athletes may accept more responsibility for the total care of the athlete, including primary and sport-related care. Some organizations record only sport-related issues; some institutions attempt to keep as much of the athlete's medical information as the athlete permits.

Some institutions strictly use paper files, while others use a combination of paper and computer files. Regardless of the specific system, athlete contact information, emergency information, and insurance information should be included in the administrative section in all of the athletes' health records. The confidential medical section that is accessible to the medical staff should include the medical problem list, the medication list, the preparticipation medical history and physical exam (and any updates), the chronologic record of injury and illness encounters with the medical staff (progress reports), the diagnostic imaging and laboratory study reports, the ancillary treatment reports, and any exercise or treatment flow sheets. To maximally utilize the computer-based record systems, the injury-tracking system should include the ability to organize and sort data for injury surveillance and administrative reports.

At this time, there is no standard documentation or file format for injury-tracking software. Without a uniform documentation system, the exchange of information between systems can be a time-consuming process. Current injury-tracking programs have no mechanism for interfacing or reliably transferring data to or from currently available electronic medical records (EMR) software. However, some have capabilities for recording medical information that rival many of the currently available EMRs. Using the same system within an institution will ease this burden and avoid the delays in availability of accurate information to other members of the sports medicine staff that can thwart appropriate follow-up care. Using the same system within a sports league can expand the power of the injury-tracking function by allowing the data to be pooled for injury surveillance. Despite the lack of a universal and uniform health record for athletes, all institutions and sports teams must be committed to comprehensive record keeping.

Athletic injury-tracking software and EMR software differ in a number of ways. With injury-tracking software, the emphasis is on recording contributing factors to injury and documenting daily or frequent treatment sessions that might include a variety of modalities and interventions. Treatment data might include physical modalities, therapeutic exercises, conditioning exercises, passive stretching, massage, and reassessments. Most also include data fields to track the circumstances of the injury, such as playing surface, environmental conditions, practice or competition, time of injury during competition, and other variables that can be analyzed for research or injury prevention strategies. Common variables are available from pull-down lists, and some programs allow the user to develop custom pull-down lists. Injury-tracking programs have in common an ability to generate reports, such as team injury reports, status reports, and daily treatment logs, which EMR software is not designed to produce.

While most EMR software can be used to record training room procedures by developing appropriate templates, this can be time intensive. EMR software is not designed to group patients for reporting as one would do when generating an injury report for a coach or to provide data

in an organized fashion for analysis. Currently available EMR programs do not include the type of injury-tracking data fields felt to be useful in injury surveillance and prevention, such as number of exposures (practices vs games), injury mechanism, and other potential risk factors. Although some of the currently available EMR programs include the ability to develop customized data fields, programming is typically a time-consuming process. Some injury-tracking programs have the ability to record SOAP notes, and some include the ability to attach medical imaging files in picture format. Some also include or have optional modules to record distribution of medications. Most injury-tracking computer programs cannot be used to generate insurance billing claims, although this capability can be purchased optionally from some vendors as discussed in the next section.

COMPUTER-BASED SOFTWARE SYSTEMS

Software-based injury-tracking systems have been used for some time, and some products have moved beyond simple injury tracking into more comprehensive sports program management and medical record instruments. These products can be purchased on disk or can be downloaded from the company Web sites. Three examples of commonly used and readily available software systems include SportsWare™, Simtrak™, and SIMS™ (Sports Injury Monitoring System). These software programs are PC-based systems, although they can be used on Apple™ computers capable of running Microsoft Windows™ software. These programs also have the ability to transfer data to and from personal digital assistant devices (PDAs). Some have the ability to generate paper insurance claims, although none are capable of generating electronic insurance claims at this time. These programs have been in use for over 12 yr and have good reputations for customer service.

SportsWare Plus
(CSMi Medical Solutions, Stoughton, MA, http://www.csmisolutions.com/index.shtml)

SportsWare injury-tracking software has been available since 1991. Numerous databases have been added since its inception, making it one of the most complete software-based systems available. Recording, managing, and reporting data is relatively easy with more than 50 report formats, a multitude of pull-down lists for data entry, retrieval, database sort commands, and integrated filter/sort commands that allow records to be retrieved according to any recorded data fields. For instance, it is simple to pull records of all athletes with ACL injuries sorted by sport, gender, surface, or other conditions. Treatment can be entered in SOAP format and includes the ability to attach reports from diagnostic studies including images and video files. A pharmaceutical tracking database also is available to record distribution of medications. In addition, SportsWare has several administrative functions that may be used for inventory control and to monitor equipment maintenance. Optional modules include an administrative interface to

generate paper insurance claims, an electronic concussion monitoring module using the Standard Assessment of Concussion and Balance Error Scoring System, and an external access function that allows athletes and/or parents to enter personal data directly into the database, saving time for the medical staff. SportsWare can be used with a single computer, network, laptop, or PDA. The basic package includes the ability to upload data to a national sports injury database (www.nationalsportsinjurydatabase.com) and allow comparison of local versus national injury rates. The injury-tracking capabilities are robust, with a wide variety of built-in reports and the ability to create custom reports. The software includes reports for coaches regarding injured players, open injuries, injury trends, treatment sessions by athlete to monitor compliance, type, and frequency of treatments provided, and others.

Simtrak
(Premier Software, Inc., Panama City, Panama, http://www.simtrak.com/)

Simtrak software has been available since 1995 and is primarily an injury-tracking software package. It is used by many major league baseball clubs and their affiliated minor league teams. The main module allows for all the injury-tracking and reporting functions that athletic trainers need on a day-to-day basis. This information can be transferred between different levels of the organization if the player is promoted, demoted, or traded to another team that uses Simtrak. The product can be customized to the needs of each organization. Basic capabilities include the ability to generate SOAP notes, attach digital images, and store records from referral and outside services. Optional modules include interface with SportPharm, a third-party program that assists the athletic training room in meeting DEA guidelines for pharmaceutical acquisition, storage, administration, disposition, record-keeping, packaging, and labeling. Additional modules can be purchased for analyzing data (Simtrak Mobility Injury Surveillance System), synchronizing data across multiple sites (Third Party Provider module), inventory control (Simtrak Inventory Control), and advanced report capability (Simtrak Report Writer). The fee for a single user is $600 with a $150 annual maintenance fee. The fee for unlimited users is $1500 with a $375 annual maintenance fee. The Premiere Version ($3000, $750 annual fee) includes software that synchronizes databases across the organization, which allows analysis of injury patterns and other data. The Premiere Version also allows transfer of player data if a player is transferred to another level or location within the organization or to another organization that uses Simtrak. An academic version is available at no cost to schools with certified athletic training and physical therapy teaching programs.

Sports Injury Monitoring System
(Flantech Computer Services, Iowa City, Iowa, http://www.flantech.net/index.html)

Sports Injury Monitoring System (SIMS) is an injury-documentation system with several features that will help the medical team organize all of the team injury information.

The standard core database includes athlete demographic and contact information, injury/illness encounter details, injury treatment and rehabilitation, physician referral and result tracking, and pharmaceutical inventory and dispensing. The pharmaceutical tracking capabilities allow the training room personnel to record medications dispensed to individual athletes and track inventory and expiration dates, but do not include compliance features available in competing products. Additional software to link with the clinician's handheld or mobile device is available and can be purchased. SIMS Training Room Companion (SIMS-TRC) is an optional module that allows athletes to sign in and enter their own treatment activity, saving the certified athletic trainer valuable time.

WEB-BASED SYSTEMS

Web-based injury-tracking systems allow access to information anywhere an Internet connection is available. The benefits of a Web-based system include ease of access, control of access, and adaptability. Access and record authority is controlled by the user type. For example, a certified athletic trainer may add or modify data, while a coach or administrator may only view the status of the athlete without access to more confidential portions of the record and without the ability to modify data. The potential disadvantages include inability to access data when Internet access is unavailable, although some systems allow local data to be downloaded for offline viewing and modification. Some systems have infrastructure costs for technical support and data backup. Examples of Web-based systems include the NCAA Injury Surveillance System (NCAA ISS) and Presagia Sports.

NCAA Injury Surveillance System

(NCAA, Indianapolis, Indiana, http://www.ncaa.org/iss)

The NCAA Injury Surveillance System (ISS) was initiated in 1982, and the Web-based system was launched in August 2004. The ISS is a Web-based athletic training record for NCAA participating schools. The purpose of the ISS is to monitor injuries and illnesses, monitor athlete participation, and analyze injury patterns. The NCAA ISS has captured more than 1 million athlete-exposures (1). The system is not designed to be a comprehensive medical record system.

It is used by the NCAA Sport Rules Committees and by the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports to provide a foundation for monitoring safety, illness, and injury trends, and for policy development. The NCAA reports that decisions based upon data provided by the ISS have resulted in a 27% decrease in injury rates in spring football (2). Data from the ISS have been analyzed in a number of published medical studies of injury patterns.

The ISS can fit any NCAA school budget, as it is provided free to member institutions. The primary limitation is that it may not include all the functions and

databases that would support the medical team in care of the athletes. Specifically, fields for imaging and laboratory reports, consult reports, pharmacologic records, and insurance billing information are not available in the database. However, the injury-tracking capabilities of the ISS are particularly thorough and include extensive data points and reporting capabilities.

The ISS is in transition between the NCAA and Datalys, which will take over operation of the ISS within the next 18 months. Datalys is a nonprofit organization that was formed by the NCAA, the American College of Sports Medicine, and BioCrossroads (a public and privately funded initiative created to support bioscientific development in Indiana). The NCAA states its continued commitment to the ISS through and after this transition. There is discussion of allowing U.S. high school athletics programs access to the ISS to enhance the ability to analyze a more uniform data set collected from high school athletic injuries. This would allow more accurate comparison of injuries between groups of athletes with different levels of skill and physical maturity, as well as providing access to sophisticated injury-surveillance technology to schools with limited budgets.

Presagia Sports

(Presagia, Montreal, QC, Canada, http://www.presagia. com/solutions/sports/presagiaSports.html)

The Presagia Corporation, formerly known as Injury Zone, has provided sport organizations with database solutions for over two decades. Presagia Sports allows the sports medicine staff with Internet capabilities instant access to an athlete's health record anytime, anywhere. There is an offline feature that can be downloaded and later synchronized with the online database. This system is highly customizable through purchase of modules covering various types of data. The Athlete Administration module includes demographics, medical background, insurance, competitive status, and other information. The Medical Module is used to record injury-specific data, training room treatments, medical encounters, immunizations, surgeries, therapy sessions, medical tests, and prescription medications, and both imaging and video files can be attached. The Case Management Module allows linking of data from disparate sources for collaboration of care between various providers, such as certified athletic trainers, primary and consulting physicians, physical therapists, and others. A Communications Module is available that allows secure electronic communication between users and notification of users involved in an athlete's care when the record changes. The Time Management Module can be used for scheduling personnel and facilities. The cost of this system is based upon the number of users and athletes in a particular program.

CONCLUSION

Documentation and tracking of athletic injuries can be expedited with computer software or Web-based information

management systems. Matching data requirements, hardware needs, and budgetary concerns can require extensive research. Use of this technology has the potential to save time, improve the flow of information between members of the sports medicine team, and analyze injury patterns to prevent or reduce injury.

References

1. Hootman, J.M., R. Dick, and J. Agel. Epidemiology of collegiate injuries for 15 sports: summary and recommendations for injury prevention initiatives. *J. Athl. Train.* 42:311–319, 2007.
2. The NCAA News Centerpiece. Available at http://www.ncaa.org/wps/ncaa?ContentID=3402. Accessed July 2008.