

Provider Attitudes Towards Return to Sport for Youth

Athletes with Concussions

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Abstract

The diagnosis and management of concussion relies upon clinical assessment tools with no proven objective means for diagnosis. With the current assessment tools available, the variability in provider competency for diagnosis and management of concussion is a concern. To determine whether or not discrepancies among providers exist, we conducted a multi-site survey of primary care providers with questions regarding assessment tools, recent consensus guidelines, return-to-sport (RTS) clearance after concussion, and familiarity with state RTS guidelines for youth athletes. We found that familiarity with consensus guidelines and Minnesota State High School League (MSHSL) guidelines fall on a spectrum from complete unfamiliarity to regular, consistent use. Additionally, a lack of communication from the sideline healthcare staff (e.g., athletic trainers) to clinic-based health providers exists. There are potential interventions to improve the quality of concussion management and RTS clearance in youth athletes.

Introduction

Medical providers face the challenge of managing youth athletes with concussions. In a world of changing management recommendations, providers must balance patient safety and long-term health with the pressures from athletes, parents, and coaches to return to sport (RTS). Current literature and recommendations from the 2017 Berlin International Conference on Concussion in Sport supports an initial rest period followed by a symptom limited stepwise return to full activity [1]. However, given the lack of physiological biomarkers and reliance on clinical judgement and subjective symptoms, this stepwise approach can be daunting for in-office physicians attempting to meet the standards of changing concussion protocols. The current evidence suggests that patients who sustain sports-related concussions (SRC) are at an increased risk for repeat SRC, musculoskeletal injury, and prolonged post-concussive symptoms, which highlights the need for correct clinical management after SRC [2]. Another obstacle of RTS for providers is the lack of communication between sideline healthcare personnel (e.g., on-site frontline athletic trainers or physicians) and in-office providers. Given that these providers may not be working within the same health care system, information about a patient's initial presentation at the time of SRC and

their progression through RTS protocols is not always readily available to those who are managing SRC patients. Despite these concerns, little work has been done to survey providers attitudes and adherence to RTS guidelines following SRC; surveys of these topics have been conducted among physical therapists [3]. This study investigates the level of confidence that providers have regarding RTS protocol, the rates of compliance with and knowledge of the latest guidelines from the Berlin Concussion Conference and the Minnesota State High School League (MSHSL), and to query providers regarding possible problems with the RTS protocols.

Methods

Survey Development

An 18 question survey was generated using Qualtrics software (Version August 2018 of Qualtrics. Copyright © 2018 Qualtrics, Provo, UT, USA). The survey asked questions pertaining to awareness of the Berlin Consensus guidelines, Minnesota State High School League (MSHSL) Concussion protocol, use of standardized concussion screening tests, communication of primary concussion information between sideline and training room healthcare providers and in-office primary care providers, confidence in return to sport decision making,

and institutional support for return to sport guidance. Most questions used a 5 point Likert scale for responses, with a lower score indicating an unfavorable position (e.g., “Never,” “Not Confident,” “No Familiarity,” “No Communication”) and a higher score indicating a favorable or positive position (e.g., “Always,” “Very Confident,” “Regular Use,” “Clear Communication”). There were additional demographic questions (provider credentials, primary site of care) and binary questions on utilization of baseline assessment data. A free text entry box was also included asking providers the biggest challenge surrounding return to sport decision making. A copy of the survey is attached (Appendix 1).

Specifically, providers were asked to rate on a Likert scale their utilization of concussion screening tests and how often these tests were used. Providers were asked if they had used Sport Concussion Assessment Tool [4], ImPACT (ImPACT Applications, Inc © 2018), Vestibulo-ocular Motion Screening [5], Balance-Error Scoring System (BESS, University of North Carolina’s Sports Medicine Research Laboratory, Chapel Hill, NC), Concussion Recognition Tool (CRT, Concussion in Sport Group 2017), other assessment tools, or no assessment tools in their clinical practice. Providers were asked if they used baseline assessment data as a part of their evaluation and management of concussion patients. Providers were asked how often they discussed the risks of not adhering to concussion management plans with patients.

Survey Distribution

The survey was reviewed by all team members prior to distribution. Distribution was completed via anonymous email link to all University of Minnesota Physicians (UMP) Primary Care providers in Family Medicine and

Sports Medicine, in Minneapolis, MN, as well as Mayo Clinic and Mayo Clinic Health System (MCHS), in Rochester, MN.

Data Collection and Analysis

Data was collected via an anonymous survey link from June 2018 to August 2018. Qualtrics software was used to visualize and interpret survey data. Statistical analysis, including a Spearman correlation matrix was performed using Qualtrics software. Free text responses were placed into similar categories for analysis and one analyst categorized free text responses. The categorization of free text responses was reviewed for accuracy and approved by three other reviewers.

Results

Demographics

The survey was distributed to 590 clinicians, 487 from Fairview Health system and 103 from UMP, and there were 33 respondents (5.6% return) to the survey during the data collection period. The type of provider and health care system are shown in Table 1.

Table 1. Characteristics of Survey Respondents. Self-reported characteristics of survey respondents by provider type and medical system. “UMN” includes UM Physicians, and Mayo includes Mayo Clinic Health Systems.

Type of provider	Respondents (%)
MD or DO	30 (90.9)
NP	2 (6.1)
Other	1 (3.0)
Medical system	Respondents (%)
UMN	21 (63.6)
Fairview	8 (24.2)
Mayo	3 (9.1)
Other	1 (3.0)

Familiarity with MSHSL and Berlin Consensus

When asked about familiarity with the MSHSL RTS guidelines on a Likert scale, the median response was 3 out of 5 with > 50% of providers reporting being unfamiliar to somewhat familiar. Familiarity with the MSHSL RTS guidelines was positively correlated with increased familiarity with the Berlin Consensus guidelines ($r=0.80, p<0.005$), improved perception of communication between sideline and in-office providers ($r=0.53, p=0.0471$), and increased confidence in the clinician’s ability to determine whether an athlete should return to

sport after a concussion ($r=0.56, p<0.005$). The median response when asked about familiarity with the Berlin Consensus guidelines was 3 with > 50% of providers reporting being unfamiliar to somewhat familiar. Familiarity with the Berlin consensus guidelines was positively correlated with increased discussion of the risks of non-adherence to RTS protocol with patients ($r=0.44, p=0.0220$), improved perception of communication between sideline and in-office providers ($r=0.53, p=0.0052$), increased confidence in clinician’s ability to determine whether an athlete should return to sport ($r=0.63, p<0.005$) (Figure 1, Graph B).

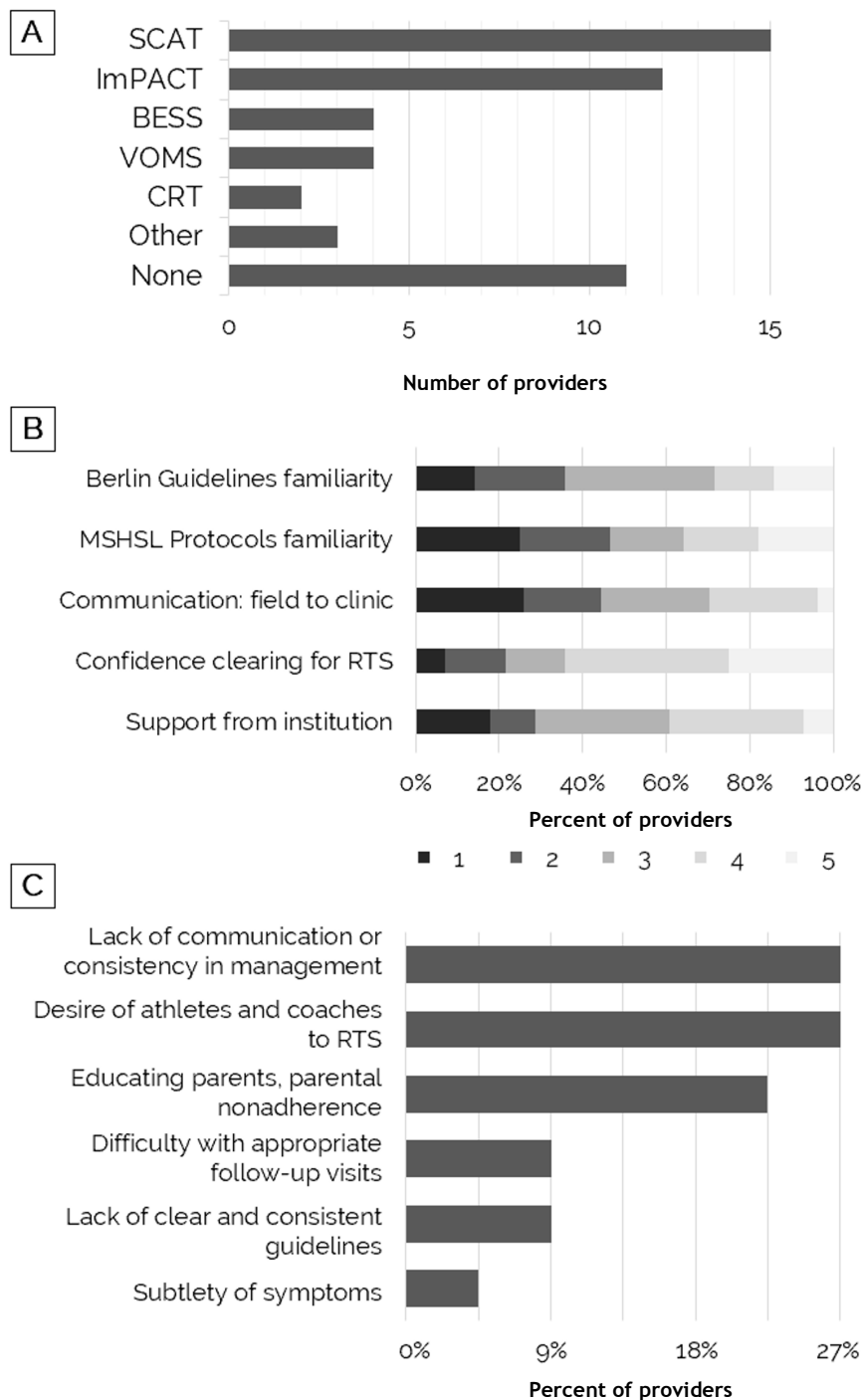


Figure 1. Provider behaviors and attitudes surrounding RTS. (A) Variability in concussion assessment tools. Self-reported use of standard assessment tools for diagnosis and management of concussion. Providers were instructed to select all the options they have used with this patient population. (B) Provider attitudes and familiarity with current guidelines regarding RTS clearance. Percent of provider responses to Likert-scale (1-5) questions. Provider familiarity with current guidelines and attitudes surrounding RTS. Familiarity with RTS guidelines from the Berlin Concussion in Sports Statement and MSHSL policy were rated from “1 – Never heard of it” to “5 – I utilize it regularly.” Providers also rated the quality of information-sharing from on-field athletic trainers to clinicians clearing for RTS, their own confidence in clearing an athlete for RTS, and level of support or education from their institution regarding RTS guidelines. (C)

Challenges for providers in RTS clearance. Major categories identified as challenges to the RTS process and percent of responses assigned to each category. Providers were asked to type, in their opinion, the biggest challenge with RTS clearance for youth athletes post-concussion. Responses were generally separable into these discrete categories, but a few responses could reasonably fit into more than one category and were separated based on interpretation of the providers' intent.

Use of Standardized Screening Tests

Fifteen providers (45.5%) noted use of SCAT, with the median reply for their frequency of use on the Likert scale between 3 and 4 and a mode score (7 replies) of 5 ("Always"). Thirteen providers (39.4%) reported use of IMPACT, with median reply frequency of use on the Likert scale of 4 and a mode score (7 replies) of 3. Four providers (12.1%) used VOMS, with median reply of 4 and mode (2 replies) of 3. Four providers (12.1%) used BESS, with two replies of 4 and two replies of 5 ("Always"). Two providers (6.1%) used CRT, with one reply of 3 and one reply of 5 ("Always"). Three (9.1%) used other tools, and 11 (33.3%) did not use any tools (Figure 1, Graph A). 18 (62%) providers indicated use of assessment data as part of evaluation and management of concussion patients, 6 (20.7%) reported no use of assessment data for this purpose, and 5 (17.2%) stated they would only do so if required by the school's athletic program.

Factors Impacting RTS Visits in Clinic

When asked how often they discussed risks of not adhering to concussion management plans, providers responded with a median reply of 3 and a mode (15 replies) of 5 ("Always"). When asked to rate the quality of sharing information on concussion symptoms, history, and baseline data between sideline and in-office providers managing RTS, providers responded heterogeneously, with 7 replies each for three of the following ratings: 1 ("No Communication"), 3, and 4. There were 5 replies rating communication at a 2 and 1 reply of 5 ("Comprehensive, Clear Communication"). Providers rated their overall confidence with RTS determinations with a skew toward higher confidence – a median reply of 3 and mode (11 replies) of 4– and rated the amount of perceived institutional support as middling, with nine replies each for ratings 3 and 4 (Figure 1, Graph B).

Six categories of free response entries to the question asking providers to identify what they felt was the biggest

challenge around RTS were generated, including lack of communication and consistency in management, desire of athletes and coaches to return to sport, parental adherence and education, difficulty with appropriate follow up visits, lack of clear guidelines, and subtlety of symptoms. Twenty-two (66.7%) of the 33 survey respondents offered answers to the free-text inquiry. Six (27%) of the comments were pertaining to communication between sideline and in-office providers, six (27%) pertained to athlete and coach desire, five (21%) discussed parental education, two (9%) mentioned difficulty with appropriate follow up, two (9%) mentioned a lack of consistent guidelines and one (6%) mentioned challenges with symptom subtlety (Figure 1, Graph C).

Table 2. Provider familiarity rating of communication, confidence, and institutional support. R values obtained using a Spearman correlation matrix. Familiarity with each set of guidelines was significant for increased ratings of confidence clearing for RTS and communication with on-field trainers. Correlations with p values of less than 0.05 and 0.005 are noted.

	Berlin Guidelines familiarity	MSHSL Protocols familiarity	Communication: field to clinic	Confidence clearing for RTS	Support from institution
Berlin Guidelines familiarity	1	0.8**	0.39*	0.56**	0.32
MSHSL Protocols familiarity	0.8**	1	0.53*	0.63**	0.27

*p < 0.05 **p < 0.005

Discussion

Despite the emergence of ancillary tools and recent advances in knowledge about concussions, proper management of RTS continues to be a significant clinical challenge for providers. Wide variation was shown in provider practices, including a diverse slate of clinical screening tests used. It should be noted that the tests described are not proven to influence concussion outcomes, which may also be an unmeasured source of provider hesitancy in adopting use of screening protocols [6]. A low overall familiarity with best practice and local state RTS protocols is likely a strong source of the wide variation in practice patterns and provider attitudes. Significant correlations were found between provider knowledge of MSHSL RTS guidelines as well as Berlin Conference criteria for concussion diagnosis and provider confidence in RTS, indicating the importance of providers remaining up to date with both practice guidelines and local RTS protocol. Increased knowledge and confidence in practice should help providers be better prepared to deal with some of the competing forces surrounding RTS, including pressures from athletes, parents, and coaches, which were noted by providers to be the greatest influencing factor with RTS decisions. Our survey demonstrated variations in concussion care delivery that may be reduced with a better understanding of Berlin Consensus guidelines and local RTS protocols. Another significant difficulty for office based providers was communication with sideline providers (physicians, athletic trainers, and others) managing patients in the acute setting. Providers in the office are often tasked with RTS

post-concussion without the full acute clinical picture. In-office providers start with a knowledge gap when providing comprehensive and responsible care for these athletes without the sideline records.

Limitations

The survey sample was limited in size with a low response rate, and the study only included providers in the Minneapolis-St. Paul and Rochester, MN metropolitan areas. The low sample increases the likelihood of bias and limits the ability to generalize the findings. The low sample size may also only include providers who do not often encounter or manage patients from the theoretical patient demographic described in this survey (presumably youth sports participants who have suffered concussion symptoms). While the Likert scale used in the survey had descriptors for responses 1 (never heard of it, never, etc) and 5 (always, very confident, etc) responses 2-4 lacked a descriptor throughout the survey. This lack of descriptor required the respondents to extrapolate what a value of 2-4 meant to them. The respondents were largely from one medical system. Data was primarily subjective, measuring provider perception around RTS. Data does not include patient and family perspectives and is not linked to patient outcomes. Despite these limitations, this study was unique in its ability to set up a framework and establish baseline for future investigation of the various challenges providers face with RTS.

Future Investigation

This study could be expanded upon by including a larger sample size and samples from different regions to see if the information is generalizable to the greater medical community. It may be valuable to add patient, family, and

coach perspectives to get a broader view of the factors contributing to RTS challenges. To fully determine the effects of provider variation, it would be beneficial to connect provider attitudes with patient outcomes.

Future Intervention

Interventions that could be employed to improve provider confidence in RTS include standardizing protocols for concussion diagnosis and management across medical systems by creating a standard assessment form for high school coaches and trainers to complete for review by providers. This could be tracked within a database that is accessible by all health systems to prevent incongruence in information between sideline and office providers. With this regard, it would be helpful to standardize one or two clinical tests for RTS use in order to provide more objective data. Additionally, there were high rates of providers feeling unfamiliar with current guidelines, either on the best practice or local league level, revealing a need for improved education of providers about RTS criteria. To aid providers, it is valuable to continue efforts to educate communities, particularly parents, athletes and coaches on concussion and RTS with public health strategies, to increase the partnership in care between athletes and their providers. By employing interventions that would increase familiarity with guidelines and streamline sideline to office communication around RTS, the process of care around SRC can be improved for providers, coaches, parents and, most importantly, athletes.

Conclusion

Medical providers indicated a wide variety in familiarity and confidence with both state and international best practice RTS management guidelines. Providers confidence with RTS decision making correlated with familiarity with current guidelines. Providers indicated a need for better communication between sideline and office staff.

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Concussion Diagnosis and Care Survey for Healthcare Providers

Start of Block: Block 1

Q16

Concussion Diagnosis and Care Survey for Healthcare Providers

This survey is intended to collect information on the standard practices of providers when caring for concussion patients, specifically youth (K-12) athletes. This survey also covers familiarity with current recommendations/resources for providers and comfort in the care process.

End of Block: Block 1

Start of Block: Default Question Block

Q1 1. What of type of provider are you?

- MD or DO (1)
 - NP (2)
 - PA (3)
 - Other (4) _____
-

Q2 2. What hospital network do you primarily work in?

- Mayo Clinic or Mayo Clinic Health System (1)
 - Fairview Health System (2)
 - University of Minnesota/ University of Minnesota Physicians (3)
 - Other (4) _____
-

Q3 3. How familiar are you with the Minnesota State High School League's (MSHSL) use of the National Federation of State High School Associations (NFHS) return to play protocol for concussed athletes?

- 1 - Never heard of it (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 - I utilize it regularly (5)
-

Q4 4. How familiar are you with the 2016 Berlin Consensus Guidelines (also known as the 2017 Concussion in Sport Group Guidelines)?

- 1 - Never heard of it (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 - I utilize it regularly (5)
-

Q5 5. Which of the following standardized tests have you used in diagnosis and clearance of youth athlete patients presenting with concussions or concussion-like symptoms?

- VOMS (1)
- ImPACT (2)
- BESS (3)
- SCAT (4)
- CRT (5)
- Other (6) _____
- None (7)

Display This Question:

If 5. Which of the following standardized tests have you used in diagnosis and clearance of youth at... = VOMS

Q15 How often do you use VOMS in diagnosis and clearance of youth athlete patients presenting with concussions or concussion-like symptoms?

- 1 - Never (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 - Always (5)

Display This Question:

If 5. Which of the following standardized tests have you used in diagnosis and clearance of youth at... = ImPACT

Q16 How often do you use ImPACT in diagnosis and clearance of youth athlete patients presenting with concussions or concussion-like symptoms?

- 1 - Never (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 - Always (5)

Display This Question:

If 5. Which of the following standardized tests have you used in diagnosis and clearance of youth at... = BESS

Q17 How often do you use BESS in diagnosis and clearance of youth athlete patients presenting with concussions or concussion-like symptoms?

- 1 - Never (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 - Always (5)

Display This Question:

If 5. Which of the following standardized tests have you used in diagnosis and clearance of youth at... = SCAT

Q18 How often do you use SCAT in diagnosis and clearance of youth athlete patients presenting with concussions or concussion-like symptoms?

- 1 - Never (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 - Always (5)
-

Display This Question:

*If 5. Which of the following standardized tests have you used in diagnosis and clearance of youth at...
= CRT*

Q19 How often do you use CRT in diagnosis and clearance of youth athlete patients presenting with concussions or concussion-like symptoms?

- 1 - Never (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 - Always (5)
-

Q6 6. How often do you discuss the risks of not adhering to concussion clearance plan management with your youth athlete patient and their parents?

- 1 - Never (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 - Always (5)
-

Q8 7. Do you include a baseline assessment for concussion tests in sports physicals?

- Yes (1)
 - No (2)
 - Only if required by the school's athletics program (3)
-

Q9 8. Do you use baseline assessment data in evaluation and continued management of concussion patients when it is available?

- Yes (1)
 - No (2)
 - Only if required by the school's athletics program (3)
-

Q10 9. How well do you feel information on concussion symptoms, history, and baseline data is shared between frontline athletic trainers/providers on the field and clinicians managing return to sport clearances?

- 1 - Little to no communication (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 - Comprehensive, clear communication (5)
-

Q11 10. How confident do you feel in your ability to determine whether an athlete should return to sport after a concussion?

- 1 - Not confident (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 - Very confident (5)
-

Q12 11. How much support and education do you feel your clinic or institution gives you in terms of guidelines for return to sport?

- 1 - Little to no support or education (1)
 - 2 (2)
 - 3 (3)
 - 4 (4)
 - 5 - Strong support or education (5)
-

Q13 12. In your opinion, what do you feel is the biggest challenge with return to sport clearances for youth athletes (K-12) after a concussion?

End of Block: Default Question Block
