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## **Sports-Related Concussion Management and Guideline Awareness in the Primary Care Setting**

### **Authors**

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## RESEARCH AND QUALITY IMPROVEMENT BRIEF

# Sports-Related Concussion Management and Guideline Awareness in the Primary Care Setting

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**Keywords:** sports injuries, brain concussion, practice guidelines

Concussion is a common sports-related injury that affects various levels of athletes across many different sports. Improved awareness about these injuries and their possible sequelae has led more patients to seek evaluation in recent years, with many presenting initially in the primary care setting.<sup>1,6</sup> One study showed that roughly 40% of pediatric providers are more likely to refer concussion cases because they are “not always comfortable with management”.<sup>2</sup> Another study found that low comfort with management can lead to a higher rate of obtaining imaging of patients with concussions.<sup>3</sup> Prior research identified gaps in sports-related concussion (SRC) knowledge among primary care providers in the setting of changing SRC management guidelines.<sup>3,4</sup> Recently, the Amsterdam conference on concussion in sports published updated consensus guidelines on concussion management.<sup>4</sup> To inform ways in which to disseminate and implement these guidelines in the primary care setting, we present our previously unpublished research evaluating gaps in SRC management among primary care providers. This information may inform the ways in which these new guidelines are disseminated and implemented in the primary care setting.

## METHODS

A cross-sectional survey evaluating demographics, SRC knowledge, comfort with SRC management,

and guideline awareness was emailed to primary care providers in New Hampshire, Vermont, and Maine. The IRB-approved survey was administered from January 2018 to June 2018, after the dissemination of the Berlin Guidelines.<sup>5</sup> Surveys were administered via regional listservs for the American Academy of Family Physicians and American Academy of Pediatrics, with one initial message and one repeat message.

## RESULTS

We distributed 1002 surveys, and 189 providers responded (18.8%). Of the respondents, approximately 15% of providers were aware of their state’s laws on SRC management, 12% were aware of the 2018 Berlin Guidelines,<sup>5</sup> and 20% were aware of the Centers for Disease Control and Prevention guidelines (Table 1). Higher knowledge was associated with prior SRC training, more frequent SRC treatment, and awareness of 3 or more guidelines. Of the 189 respondents providing SRC care, approximately 54% (n=90) continued to endorse prolonged rest (>48 h), contrary to the current guidelines. Most providers incorrectly answered questions pertaining to computed tomography and magnetic resonance imaging in SRC cases. On a 9-question SRC management survey, only 17% of providers correctly answered 6 or more questions (Table 2).

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**Table 1.** Demographic, Clinical, and Training Characteristics of Survey Respondents (n = 166)

Characteristic	No. (%)
Sex	
Female	99 (59.6)
Male	67 (40.4)
Age, y	
<50	82 (49.4)
50-60	60 (36.1)
>60	24 (14.5)
Credentials MD/DO*	164 (98.8)
Years in practice†	
<15	54 (32.7)
15-25	74 (44.9)
>25	37 (22.4)
State of practice	
Maine	122 (73.5)
New Hampshire	38 (22.9)
Vermont	6 (3.6)
SRC training in past 2 years	57 (34.3)
Treatment of SRC ≥1 per month	83 (50.0)
Special SRC experiences‡	
Player for contact sport	21 (12.7)
Concussion consultant for school	11 (6.6)
Personal history of concussion	15 (9.0)
Sideline coverage	33 (19.9)
Special interest in SRC	54 (32.5)
Coach for contact sport	13 (7.8)
Sports medicine board-certified	21 (12.7)
Guideline awareness§	
State law	64 (14.8)
Zurich	48 (11.1)
Berlin	52 (12.0)
CDC§	84 (19.4)
Best practice	85 (19.6)
SCAT#	89 (20.6)
Other	11 (2.5)

Abbreviations: CDC, Centers for Disease Control and Prevention; SRC, sports-related concussion; SCAT, Sport Concussion Assessment Tool.

\* Other credentials include PA and NP.

† N = 165.

‡ Special experiences and guideline awareness were check all that apply.

§ CDC HEADS UP.

|| Best practice guidelines from consensus statements of national organizations.

# 5th edition

**Table 2.** Concussion Management Knowledge Questions Assessed by Survey (n = 166)

	<b>Correct, No. (%)</b>	<b>Incorrect, No. (%)</b>
<b>Concussion management knowledge</b>		
<b>Diagnostic imaging</b>		
Q1-Q4: What is the likelihood of your obtaining imaging (CT or MRI) in each of these clinical scenarios?		
Q1: New concussion with questionable LOC, seen within the first 24 hours, no neurological findings.	78 (47.0)	88 (53.0)
<i>Correct answer:</i> Definitely not		
Q2: New concussion with questionable LOC and focal neurological findings or repeated vomiting.	92 (55.4)	74 (44.6)
<i>Correct answer:</i> Definitely		
Q3: Concussion symptoms unchanged from initial assessment at week 1, no focal findings.	51 (30.7)	115 (69.3)
<i>Correct answer:</i> Definitely not		
Q4: Concussion symptoms unchanged from initial assessment at week 3, no focal findings.	26 (15.7)	140 (84.3)
<i>Correct answer:</i> Definitely not		
<b>Management questions</b>		
Q5: Do you prescribe/recommend medications specifically for concussion symptoms?	115 (69.3)	51 (30.7)
<i>Correct answer:</i> No		
Q6: How long do you typically recommend staying out of school or work after a concussion?	77 (46.4)	89 (53.6)
<i>Correct answer:</i> 1 or 2 days		
Q7: Do you recommend return to physical activity (such as walking or playing with a dog without risk to head injury) before symptoms are gone?	92 (55.4)	74 (44.6)
<i>Correct answer:</i> Yes		
Q8: How long do you recommend concussed athletes avoid exercising such as running, stationary biking, or other activities not at risk for contact or collision?	129 (77.7)	37 (22.3)
<i>Correct answer:</i> May return once better, even if recovery is within 2-3 days		
Q9: Are you aware of the return to play guidelines, and if so, what is your recommendation if an athlete fails at any level?	133 (80.1)	33 (19.9)
<i>Correct answer:</i> Repeat the previous level and then progress as able		

Abbreviations: CT, computed tomography; LOC, loss of consciousness; MRI, magnetic resonance imaging; SRC, sports-related concussion.

## DISCUSSION

A primary purpose of this research was to understand primary care providers' knowledge of current SRC guidelines. Most providers (88%) in this study reported awareness of at least 1 guideline or state law, but few were aware of their own state's laws on SRC. Also, only 12% of providers were aware of the Berlin Guidelines,<sup>5</sup> which provided the most up-to-date and comprehensive SRC guidelines at the time of the study.<sup>4</sup> Given that our study showed relatively low rates of awareness of the Berlin Guidelines, renewed focus on the dissemination of updated guidelines to primary care providers caring for patients with SRC is critical. This study is limited by nonresponse bias, and most respondents were providers in the state of Maine. Further, it is unclear to what extent improving awareness of SRC guidelines could improve evidence-based care for patients.

## CONCLUSIONS

Our study shows that primary care providers have limited awareness of expert consensus guidelines related to SRC management. In light of the recent publication of updated guidelines, specialists who are familiar with these new guidelines should work to share this information more broadly across

all primary care providers who see patients with an SRC. Ensuring awareness of the most up-to-date clinical guidelines is crucial as a step toward delivering SRC care consistent with consensus expert opinion.

**Conflicts of Interest:** None

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