

Do family physicians, emergency department physicians, and pediatricians give consistent sport-related concussion management advice?

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Abstract

Objective To identify differences and gaps in recommendations to patients for the management of sport-related concussion among FPs, emergency department physicians (EDPs), and pediatricians.

Design A self-administered, multiple-choice survey was e-mailed to FPs, EDPs, and pediatricians. The survey had been assessed for content validity.

Setting Two community teaching hospitals in the greater Toronto area in Ontario.

Participants Two hundred seventy physicians, including FPs, EDPs, and pediatricians, were invited to participate.

Main outcome measures Identification of sources of concussion management information, usefulness of concussion diagnosis strategies, and whether physicians use common terminology when explaining cognitive rest strategies to patients after sport-related concussions.

Results The response rate was 43.7%. Surveys were completed by 70 FPs, 23 EDPs, and 11 pediatricians. In total, 49% of FP, 52% of EDP, and 27% of pediatrician respondents reported no knowledge of any consensus statements on concussion in sport, and 54% of FPs, 86% of EDPs, and 78% of pediatricians never used the Sport Concussion Assessment Tool, version 2. Only 49% of FPs, 57% of EDPs, and 36% of pediatricians always advised cognitive rest.

Conclusion This study identified large gaps in the knowledge of concussion guidelines and implementation of recommendations for treating patients with sport-related concussions. Although some physicians recommended physical and cognitive rest, a large proportion failed to consistently advise this strategy. Better knowledge transfer efforts should target all 3 groups of physicians.

EDITOR'S KEY POINTS

- The results of this study indicate that current knowledge transfer efforts are not adequately addressing all groups of physicians. Large knowledge gaps and inconsistencies in the implementation of the recommendations outlined in the Concussion in Sport Group 2008 international consensus statement were identified.
- The Sport Concussion Assessment Tool is not commonly used in clinical settings. This might indicate that it is not a useful or a practical tool given the time constraints in office and emergency settings, or that physicians are unaware that it exists. The reasons for lack of use should be further investigated.
- While many physicians are recommending physical and cognitive rest to their patients after sport-related concussions, a large proportion fail to consistently advise this strategy. As a result of these findings, better knowledge transfer efforts should target FPs, emergency department physicians, and pediatricians to improve awareness and implementation of current sport-related concussion management recommendations.

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Les médecins de famille, les médecins des services d'urgence et les pédiatres donnent-ils des conseils pertinents concernant le traitement des commotions cérébrales dans le sport?

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Résumé

Objectif Cerner les différences et les lacunes qu'on observe dans les recommandations de traitement que les MF, les médecins des services d'urgence (MSU) et les pédiatres font aux victimes de commotions dans le sport.

POINTS DE REPÈRE DU RÉDACTEUR

- Les résultats de cette étude indiquent que les mesures actuelles de transfert des connaissances ne visent pas adéquatement tous les groupes de médecins. Des lacunes et des différences importantes ont été observées dans l'application des recommandations formulées dans la déclaration consensuelle internationale de 2008 du Concussion in Sport Group.
- On n'utilise pas régulièrement le Sport Concussion Assessment Tool dans les milieux cliniques. On pourrait en conclure que ce n'est pas un outil pratique en raison des contraintes de temps dans les bureaux et les urgences, ou encore que les médecins en ignorent l'existence. Les raisons pour lesquelles on l'utilise peu devraient être investiguées.
- Bien que de nombreux médecins recommandent un repos physique et cognitif aux victimes de commotion dans le sport, beaucoup d'entre eux ne le font pas invariablement. Ces résultats suggèrent qu'un meilleur transfert des connaissances devrait viser les MF, les médecins des services d'urgence et les pédiatres afin d'améliorer la connaissance et l'application des recommandations actuelles sur le traitement des commotions dans le sport.

Type d'étude Une enquête auto-administrée à choix de réponses a été adressée par courriel à des MF, des MSU et des pédiatres. La teneur de l'enquête a été validée.

Contexte Deux hôpitaux communautaires d'enseignement du Grand Toronto, en Ontario.

Participants On a invité 270 médecins à participer, incluant des MF, des MSU et des pédiatres.

Principales questions à l'étude D'où provient l'information utilisée pour le traitement des commotions? Les stratégies utilisées pour diagnostiquer les commotions sont-elles utiles? Et les médecins emploient-ils une terminologie identique pour expliquer aux patients la nécessité d'un repos cognitif après une commotion liée au sport.

Résultats Le taux de réponse était de 43,7%. L'enquête a été complétée par 70 MF, 23 MSU et 11 pédiatres. Dans l'ensemble, 49% des MF, 52% des MSU et 27% des pédiatres ont dit ne connaître aucune déclaration consensuelle concernant les commotions dans le sport, et 54% des MF, 86% des MSU et 78% des pédiatres n'utilisaient jamais la version 2 du Sport Concussion Assessment Tool. À peine 49% des MF, 57% des MSU et 36% des pédiatres conseillaient systématiquement un repos cognitif.

Conclusion Cette étude a identifié d'importantes lacunes dans la connaissance des directives sur les commotions et dans l'application des recommandations de traitement pour les victimes de commotion dans le sport. Même si certains médecins recommandaient un repos physique et cognitif, une forte proportion d'entre eux ne le faisait pas régulièrement. Des formations spécifiques visant ces 3 groupes de médecins seraient fortement souhaitées.

Cet article a fait l'objet d'une révision par des pairs.
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Many Canadian physicians providing primary care will have patients present to them with sport-related concussions. Statistics Canada indicated that, during a 12-month period from 2009 to 2010, 29 000 people aged 12 to 19 years and 94 000 people aged 12 years and older experienced concussions.¹ A recent study found that more than 250 000 patients aged 8 to 19 years presented to US emergency departments for sport-related concussions from 2001 to 2005.^{2,3} After a sport-related concussion, brain dysfunction can persist for longer than the usual 7 to 10 days for 10% to 20% of cases.⁴ Indeed, there is evidence to suggest that younger athletes require longer recovery periods than the typical 7 to 10 days. A study of high school students with concussions from playing football showed that 25% might require 4 weeks before they are fully recovered.⁵ This often constitutes a temporary disability for the student returning to school or the adult returning to the workplace while still experiencing symptoms. To facilitate an optimal recovery, physicians must have adequate knowledge of current best practices in sport-related concussion management and present these recommendations to their patients effectively.

The approach to sport-related concussion management is rapidly evolving. A recent chart review study⁶ outlined the development over the past 12 years of current best practices by the Concussion In Sport Group (CISG). This committee of worldwide experts has formulated consensus statements based on the proceedings at concussion management conferences.^{4,7} The cornerstone of concussion management is rest until all symptoms resolve, followed by a graded program of exertion before returning to sport.⁷ During the period of recovery in the days following a sport-related concussion, it is important to emphasize physical and cognitive rest. Activities that require concentration and attention, such as reading or computer work, can exacerbate symptoms and delay recovery. In students, limits might be needed on scholastic activities while symptoms persist.⁷ According to the most recent international consensus conference, which took place in November 2012, more research is necessary to determine the exact nature of optimal rest.⁴ Consensus recommendations suggest that "a sensible approach involves the gradual return to school and social activities (prior to contact sports) in a manner that does not result in a significant exacerbation of symptoms."⁴

Knowledge transfer efforts play an integral role in alerting Canadian physicians to crucial revisions of best practices for concussion management.⁸ Organizations such as ThinkFirst Canada, now part of Parachute (www.parachutecanada.org), have led this effort through road shows, websites, lectures, and journal articles.⁹⁻¹¹ Their aim has been to deliver current and practical management recommendations for sport-related concussion

to physicians across Canada. However, the outcome of such efforts has not been formally measured. It is not known how widely accessed their information is, or by whom and to what outcome.

The CISG 2008 consensus statement does not provide clear recommendations on how to achieve optimal cognitive rest. In contrast, the recommendation for physical rest until the patient is symptom free and then a stepwise progression in activity is clearly stated.⁷ It would be informative to know if advice given to patients on cognitive rest differs among professional groups. Assessing the recommendations physicians use in post-concussion clinical encounters will elucidate whether knowledge transfer efforts are succeeding. By surveying different groups of physicians about their management of patients with sport-related concussions, differences in care and gaps in recommendations can be identified. This will assess the success of sport-related concussion management knowledge transfer efforts aimed at physicians in Canada.

METHODS

Family physicians, emergency department physicians (EDPs), and pediatricians on staff at 2 community teaching hospitals in the greater Toronto area in Ontario were surveyed. Ethics approval was obtained from the research ethics board at Toronto East General Hospital. A modified Dillman approach was used to construct and administer the survey.¹²

A 19-question multiple-choice survey was created and sent to 10 methodologists and to 10 typical participants for content validation. An iterative process was used to ensure question relevancy and clarity. Contact was then made with the chiefs of the departments of family medicine, emergency medicine, and pediatrics at the 2 hospitals explaining the study and asking for their endorsement. Pilot testing was done with family medicine residents in the teaching units of the 2 hospitals. The chiefs of each hospital department e-mailed a link to the survey to their department members. Anonymity was retained in all follow-up e-mails. Data were analyzed using SPSS. Frequencies and percentages were calculated along with cross-tabulations by specialty, and χ^2 tests were done to determine whether there were any statistically significant differences between groups.

RESULTS

A total of 270 physicians, including 170 FPs, 78 EDPs and 22 pediatricians, were sent e-mails asking for their participation. There were 118 respondents, for a response rate of 43.7%. Fourteen physicians were asked to stop

completing the survey, as they indicated that they did not assess patients with sport-related concussions in their clinical practices. Of the remaining 104 respondents, 24% of FPs, 95% of EDPs, and 30% of pediatricians had assessed 10 or more sport-related concussion cases in the previous 2 years. Family medicine journal articles were found to be very useful or fairly useful as a resource by 70% of physicians. No more than 60% of survey respondents found any of the other resources, including other journal articles, continuing medical education presentations, hospital rounds, and mixed media, to be very useful or fairly useful. When asked how useful they found the ThinkFirst website as a learning resource, 68% of respondents answered “not applicable” (Table 1). In total, 49% of FPs, 52% of EDPs, and 27% of pediatricians were unaware of any sport-related concussion consensus statements. Many physicians answered that they sometimes, usually, or always ordered diagnostic imaging in the investigation of sport-related concussion (Table 2). Most physicians from each group never used the Sport Concussion Assessment Tool, version 2, (SCAT2) for these cases (Table 3). Approximately half of each group always advised cognitive rest (Table 4). There were no significant differences between the responses from the 2 hospitals.

DISCUSSION

The results of this survey indicate that current knowledge transfer efforts are not adequately addressing all groups of physicians. The survey was conducted in the spring of 2012, before the most recent CISG consensus statement.⁴ Large differences in the assessment, diagnosis, and management of sport-related concussion were identified among the physicians surveyed. Approximately half of FPs and EDPs and approximately one-third of pediatricians had no knowledge of published CISG consensus statements, which outline the best practices for assessing and providing care for sport-related concussion patients.^{4,7}

The CISG 2012 consensus statement highlights the importance of knowledge transfer efforts for effective sport-related concussion management.⁴ It suggests that implementing knowledge transfer strategies requires a defined plan, stating that “identifying the needs, learning styles and preferred learning strategies of target audiences, coupled with evaluation, should be a piece of the overall concussion education puzzle to have an impact on enhancing knowledge and awareness.”⁴ ThinkFirst Canada has taken a leadership role in disseminating high-quality sport-related concussion resources to Canadian physicians. Many physicians in all 3 groups were either unaware of the ThinkFirst website or did not find it useful. It is important for ThinkFirst and similar

Table 1. Usefulness of the ThinkFirst website

| RATING | FPS, N (%) N = 65 | EDPs, N (%) N = 20 | PEDIATRICIANS, N (%) N = 11 | TOTAL, N (%) N = 96 |
|-------------------|----------------------|-----------------------|--------------------------------|------------------------|
| Very useful | 13 (20) | 4 (20) | 1 (9) | 18 (19) |
| Fairly useful | 3 (5) | 2 (10) | 1 (9) | 6 (6) |
| Not very useful | 6 (9) | 0 (0) | 0 (0) | 6 (6) |
| Not at all useful | 1 (2) | 0 (0) | 0 (0) | 1 (1) |
| Not applicable | 42 (65) | 14 (70) | 9 (82) | 65 (68) |

EDP—emergency department physician.

Table 2. Use of diagnostic imaging in the investigation of sport-related concussion

| FREQUENCY OF USE | FPS, N (%) N = 69 | EDPs, N (%) N = 21 | PEDIATRICIANS, N (%) N = 10 | TOTAL, N (%) N = 100 |
|------------------|----------------------|-----------------------|--------------------------------|-------------------------|
| Always | 3 (4) | 0 (0) | 0 (0) | 3 (3) |
| Usually | 8 (12) | 1 (5) | 0 (0) | 9 (9) |
| Some of the time | 26 (38) | 11 (52) | 8 (80) | 45 (45) |
| Rarely | 16 (23) | 6 (29) | 0 (0) | 22 (22) |
| Never | 16 (23) | 3 (14) | 2 (20) | 21 (21) |

EDP—emergency department physician.

Table 3. Use of the SCAT2 in the assessment of sport-related concussion

| FREQUENCY OF USE | FPS, N (%) N = 68 | EDPs, N (%) N = 21 | PEDIATRICIANS, N (%) N = 9 | TOTAL, N (%) N = 98 |
|------------------|----------------------|-----------------------|-------------------------------|------------------------|
| Always | 6 (9) | 1 (5) | 2 (22) | 9 (9) |
| Usually | 5 (7) | 0 (0) | 0 (0) | 5 (5) |
| Some of the time | 10 (15) | 2 (10) | 0 (0) | 12 (12) |
| Rarely | 10 (15) | 0 (0) | 0 (0) | 10 (10) |
| Never | 37 (54) | 18 (86) | 7 (78) | 62 (63) |

EDP—emergency department physician, SCAT2—Sport Concussion Assessment Tool, version 2.

Table 4. Cognitive rest advice given to patients with sport-related concussions

| FREQUENCY OF ADVICE | FPS, N (%) N = 68 | EDPs, N (%) N = 21 | PEDIATRICIANS, N (%) N = 11 | TOTAL, N (%) N = 100 |
|---------------------|----------------------|-----------------------|--------------------------------|-------------------------|
| Always | 33 (49) | 12 (57) | 4 (36) | 49 (49) |
| Usually | 16 (24) | 4 (19) | 2 (18) | 22 (22) |
| Some of the time | 12 (18) | 1 (5) | 3 (27) | 16 (16) |
| Rarely | 3 (4) | 0 (0) | 0 (0) | 3 (3) |
| Never | 4 (6) | 4 (19) | 2 (18) | 10 (10) |

EDP—emergency department physician.

organizations to conduct further outcome studies to measure how effectively their message is disseminated and received.

There is inconsistent use of sport-related concussion management recommendations across all 3 groups of physicians. The current use of neuroimaging in concussion diagnosis is inconsistent with evidence-based practice. Brain computed tomography should only be ordered if there is suspicion of an intracerebral structural lesion, which would manifest as a change in consciousness, focal neurologic deficits, or worsening symptoms.⁷ Many physicians might be ordering unnecessary imaging that not only exposes the patient to excessive radiation but also increases health care costs. Additionally, physicians in all 3 groups did not report using the SCAT2, a standardized method of evaluating patients with sport-related concussions that can also be used as a baseline measure. This might indicate that the SCAT2 is not a useful or a practical tool given the time constraints in office and emergency settings, or that physicians are unaware that it exists. Indeed, some respondents believed the consensus statements were useful to help manage these cases, yet several of these physicians rarely or never used the SCAT2. As this tool can be a useful adjunct to clinical diagnosis, reasons for its lack of use should be explored in more depth.

The CISG 2008 consensus statement indicates that the cornerstone of concussion management is “physical and cognitive rest until symptoms resolve and then a graded program of exertion prior to medical clearance and return to play.”⁷ Yet many surveyed physicians did not consistently recommend physical and cognitive rest. Therefore, more intensive knowledge transfer efforts are needed. For those physicians who always or usually recommend cognitive rest, we did not find that they consistently used similar terminology when explaining these strategies. A second arm of this validated survey compared sport medicine physicians and EDPs across Canada. Similar gaps and differences in the management of patients with sport-related concussions were identified, reinforcing a need for improved knowledge transfer strategies.¹³

Limitations

The length of the survey might have elicited frustration in the participants and, as a result, their answers might have been rushed or inaccurate. Another limitation of our study was our focus on the efforts of CISG and ThinkFirst without directly referencing other guidelines or knowledge transfer organizations in our survey.

Conclusion

In this study, large knowledge gaps and inconsistencies in the implementation of the recommendations outlined in the CISG 2008 international consensus

statement on concussion in sport were identified among FPs, EDPs, and pediatricians. The SCAT2 was not commonly used in clinical settings and the reasons for this should be further investigated. While many physicians are recommending physical and cognitive rest to their patients after sport-related concussions, a large proportion fail to consistently advise this strategy. As a result of these findings, better knowledge transfer efforts should target FPs, EDPs, and pediatricians to improve awareness and implementation of current sport-related concussion management recommendations. 🌿

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Contributors

Dr Stoller was co-principal investigator; she constructed, revised, and tested the survey, and conducted a pilot study. **Dr Carson** was co-principal investigator; he coordinated the validation of the survey and the writing of the manuscript. **Ms Garel** collated the data and contributed to editing the manuscript. **Ms Libfeld** contributed to analysis and interpretation of data, and the writing of the manuscript. **Ms Snow** was a research assistant, and prepared documents for research ethics board approval. **Dr Law** facilitated the ethics board application and approval, and provided guidance and comments throughout the project. **Dr Frémont** provided expertise and advice.

Competing interests

None declared

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