

# Identifying concussion: when guidelines collide with real-world implementation—is a formal medical diagnosis necessary in every case once a proper protocol is implemented?

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## MAIN TEXT

Several countries, such as Canada, are in the process of defining strategies to address the public health problem of sport-related concussions. One of the challenges is to develop strategies that can apply at the earlier levels where the timely availability of qualified healthcare resources is limited.

Here, I respectfully challenge the notion that every athlete with suspected concussion should have a medical consultation to confirm the diagnosis.

Specifically, I question the added value of the systematic requirement for a medical diagnosis in a sport or school-based environment, when a suspected case of concussion *without* any 'red flag' (as per the concussion recognition tool)<sup>1</sup> is identified and a proper concussion management protocol is initiated.

The Zurich consensus states that, following the identification of a suspected case of concussion, 'The final determination regarding concussion diagnosis and/or fitness to play is a medical decision based on clinical judgement'.<sup>2</sup> Also, the concussion recognition tool recommends that: '... in all cases of suspected concussion, the player is referred to a medical professional for diagnosis and guidance...'.<sup>1</sup> However, the American Academy of Neurology position statement on concussion only requires that the injured athlete does not 'return to play until... assessed by an experienced licensed healthcare provider with training both in the diagnosis and management of concussion...'.<sup>3</sup>

## ARE THERE ENOUGH DOCTORS TO GO AROUND?

One important consideration is the capacity of the medical profession in providing consistent diagnosis and counselling

following a concussion. In Canada, 27% of paediatricians, 52% of emergency physicians and 49% of family physicians self-reported no knowledge of any consensus in regards to concussion in sport.<sup>4</sup> Furthermore, in emergency medical care settings, the definition of mild traumatic brain injury provided by the WHO task force<sup>5</sup> is in common use. By requiring the presence of at least one of five specific criteria that do not include the most frequent symptoms associated with concussions,<sup>6</sup> this definition fails to identify a large proportion of sport concussions.

In the USA, the main purpose of concussion legislations adopted by every state is to recognise and properly react to a concussion, and prevent premature return to play (RTP).<sup>7</sup> Once a concussion is suspected, these laws typically prohibit RTP until a medical clearance is obtained.

## BUT MOST GET BETTER!

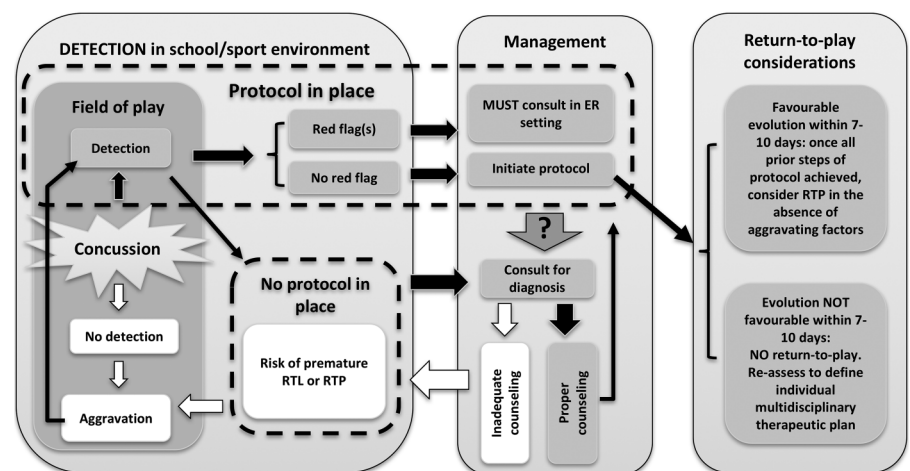
An important characteristic of sport concussion is a spontaneously favourable

evolution in 80–90% of cases within 7–10 days.<sup>2</sup> Therefore, as long as there is no 'red flag' initially and no RTP is attempted prior to medical clearance (based on successfully achieving the three key phases of concussion management: resolution of symptoms, return-to-learn and gradual return to non-contact high-intensity activity), medical resources may be used in a more efficient manner. In environments that have implemented a protocol, and as long as the presumption of a concussion remains unchallenged, and no RTP is attempted, the rationale to mandate systematic medical consultation for an initial diagnosis can be questioned.

Figure 1 illustrates that, once a proper protocol has been implemented, a systematic requirement for a medical diagnosis of concussion will, at best, lead to the application of the principles already included in the protocol. In a proportion of cases, this may lead to improper diagnosis or counselling that may result in premature RTP.

## KEY STEPS

The most important aspects of safe concussion management are early detection and structured management, including no RTP if a concussion is suspected and arranging for urgent medical care if red flags are present. At earlier levels of participation, there is rarely a qualified medical expert on the sideline, so suspicion for concussion would fall to the most responsible party on the field of play. Therefore, those parties present in school



**Figure 1** Schematic representation of concussion management from identification to return-to-play considerations. The arrow with the question mark (?) indicates the uncertain benefit of systematic initial consultation for a medical diagnosis of concussion. White arrows and boxes indicate undesired trajectories and outcomes. Definitions: 'Protocol', a structured application and monitoring of the three phases of concussion management (resolution of symptoms, successful return-to-learn and successful return to non-contact, high-intensity physical activity); 'red flag' refers to the criteria listed in the concussion recognition tool. ER, emergency room; RTL, return-to-learn; RTP, return-to-play.

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and sport environments, not medical experts, are best placed to implement and administer concussion protocols; they must optimise awareness, detect concussions and initiate age-appropriate early management. One of the challenges of such strategies, especially at subelite levels, will be to address the situation of players who resist appropriate concussion management or those with a history of concussion characterised by modifying factors.<sup>2</sup>

Public health strategies should empower those in school and sport environments to identify and provide early management (*watch for red flags and no RTP*) of presumed cases of concussion.

In a public healthcare system, these strategies should optimise the timely availability of medical experts on concussion in the following situations:

- ▶ Cases occurring in environments where no protocol has been implemented (eg, leisure activities);

- ▶ Cases presenting with 'red flags', cases that do not clearly improve within 7–10 days, to make decisions about RTP; or

- ▶ When someone challenges the presumption that a concussion has occurred.

Finally, consideration for the availability of qualified resources should guide experts on concussion in the process of developing recommendations that might prove more realistic for implementation at every level of sport participation.

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