

Oral Health: Preventing Craniofacial Injuries, Community-Based Interventions to Encourage Use of Helmets, Facemasks, and Mouthguards in Contact Sports

Task Force Finding and Rationale Statement

Table of Contents

Intervention Definition	2
Task Force Finding.....	2
Rationale	2
Basis of Finding	2
Applicability and Generalizability Issues.....	3
Data Quality Issues.....	3
Other Benefits and Harms.....	4
Considerations for Implementation.....	4
Evidence Gaps.....	4
References	4
Disclaimer.....	5

Task Force Finding and Rationale Statement

Intervention Definition

Community-based interventions can encourage people involved in contact sports to use helmets, facemasks, and mouthguards to prevent craniofacial injuries. These interventions include at least one of the following:

- Educational approaches designed to influence knowledge, attitudes, or behaviors among health professionals, parents, coaches, players, and officials engaged in organized sports (e.g., providing informational messages about the risk for injury and potential benefit of protective equipment)
- Promotional activities (e.g., raising awareness or providing equipment at reduced or no cost or offering incentives for their use)
- Environmental or policy approaches (e.g., establishing and enforcing rules of play that require use of protective equipment)

Contact sports are defined as team or combat sports where full or limited contact occurs between players or between a player and an object. In full contact sports, such as football or boxing, there is intention to make forceful contact, and typically a greater force of impact. In limited contact sports, such as baseball or field hockey, reasonable impact with an opposing player or object is not intentional but possible. In some sports, contact is an acceptable part of the game that may be regulated, and in some instances, may incur penalties (as dictated by rules of the game).

Craniofacial injuries are defined as injuries to the skull (cranium), upper jaw (maxilla) or face and include oral and dental injuries. Other forms of head injury, such as traumatic brain injuries or concussions, were not considered as outcomes for this review.

Task Force Finding (October 2013)

The Community Preventive Services Task Force finds insufficient evidence to determine the effectiveness of community-based interventions to encourage the use of helmets, facemasks, and mouthguards to prevent craniofacial injuries in contact sports. This finding is based on a small number of heterogeneous studies with inconsistent results. These inconsistent results may be due, in part, to variations in the use and effectiveness of helmets, facemasks, and mouthguards in different sports.

The limited evidence highlights the need for research to further establish the efficacy of safety equipment for different sports and the effectiveness of community-based interventions to increase the use of equipment proven to reduce craniofacial injuries.

Rationale

Basis of Finding

The Task Force finding is based on evidence from a systematic review (8 studies, search period 1946-November 2012). This finding updates and replaces the 2000 Task Force finding on Population-Based Interventions to Encourage Use of Helmets, Facemasks, and Mouthguards in Contact Sports to Prevent Oral and Facial Injuries.

Included studies were associated with six different sports and evaluated a variety of interventions including area-specific mandates and promotional campaigns that aimed to raise awareness of, or provide or improve access to, protective equipment.

Five of the included studies provided data on the impact of interventions on the use of protective equipment. Three of these studies evaluated interventions that provided protective equipment and found inconsistent results (two interventions provided rugby players with mouthguards, and one provided headgear to rugby and U.S. football players). The other two studies evaluated awareness campaigns and similarly found inconsistent results (one study demonstrated an increase in mouthguard use among football players following Australian Rules, the other found no difference in the use of eyewear among racquetball players).

Seven of the included studies provided data on craniofacial injuries. Four of these studies evaluated interventions that provided protective equipment and found conflicting results (two interventions focused on rugby, one addressed Australian Rules football and one included both rugby and U.S. football). One study evaluated an awareness campaign promoting mouthguard use in Australian Rules football and showed a statistically significant but small decrease in dental injuries. The remaining two studies evaluated the effectiveness of equipment use mandates for ice hockey and lacrosse and reported conflicting results (one study of facemask mandates for ice hockey players demonstrated a reduction in injuries, the other study of eyewear mandates for lacrosse players demonstrated no effect).

The diversity in sports, potential injuries, and population characteristics across the studies limit the ability to pool data and draw any general conclusions about intervention effectiveness.

Despite limited evidence for the effectiveness of community-based interventions (the focus of this review), there is evidence to support the efficacy of mouthguards and facemasks in preventing craniofacial injuries in contact sports (Knapik et al., 2007; Benson et al, 2009; Asplund et al, 2009). There is also a large body of evidence to support the efficacy of helmets in non-contact sports such as cycling and skiing (Thompson et al, 2009; Benson et al, 2009) though there is limited evidence for the efficacy of helmets in contact sports.

Applicability and Generalizability Issues

Seven of the included studies were conducted in high-income countries, suggesting results are applicable to the U.S. Applicability of findings to particular sports, however, is difficult as included studies were conducted with six different sports and evidence from the wider literature suggests the incidence of craniofacial injuries is higher in some sports, such as football and ice hockey.

The broader literature indicates that in most sports, males are more likely than females to experience craniofacial injuries, and to sustain more severe injuries. Craniofacial injuries most commonly occur among people between the ages of 5 and 20 years; this review included people between 10 and 44 years. Included studies lacked information about players' socioeconomic status (SES) or previous injuries. Due to methodological heterogeneity, variation in injury type, and the low number of studies, the individual effects of these factors could not be assessed.

Data Quality Issues

Most of the included studies failed to adequately control for potential confounding factors such as previous injuries sustained, SES, and equipment use in control groups. Additionally, given the nature of the studies involved, it was impossible to blind researchers: some studies used trained staff to assess outcomes and others relied on coaches to record outcome data.

Most studies provided inadequate descriptions of their samples and intervention components to allow for implementation in other settings. For example, although providing equipment was the intervention in 50% of included studies, there was little information about what this process entailed. One of the studies vaguely reported providing

encouragement as the intervention, but it was unclear how encouragement was provided, over what time frame, or by whom.

Other Benefits and Harms

The use of protective equipment to prevent craniofacial injuries in contact sports has the potential to reduce emergency department and other medical visits, immediate and life-long costs associated with restorative dental treatments, and time lost from work or school. The wider literature suggests that protective sports equipment also may reduce risk of concussion and traumatic brain injury.

The wider literature includes concerns about the effect of equipment use on players' athletic performance. Potential harms associated with the use of helmets, facemasks, and mouthguards include impaired breathing, speech, peripheral vision, and hearing. An additional concern is risk compensation, whereby players using protective equipment may take greater risks because they perceive themselves to be protected.

Considerations for Implementation

Potential barriers to implementation involve players' concerns about equipment comfort and athletic performance. Helmets, facemasks, and mouthguards vary in quality, fit, and comfort and their individual properties have the potential to inhibit or promote their use as well as affect their protective properties. The variability in their design and use across a wide variety of sports requires additional consideration.

Evidence Gaps

More research is needed to close evidence gaps around the efficacy of various protective equipment devices to prevent various injuries in different contact sports. Further research is also required to establish the effectiveness of community-based interventions that both provide and promote the use of protective equipment proven to prevent craniofacial injuries while participating in contact sports. Ideally, this research will employ consistent outcome measures and definitions. Finally, research should examine potential harms, especially with regards to risk compensation behavior.

The data presented here are preliminary and are subject to change as the systematic review goes through the scientific peer review process.

References

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Disclaimer

The findings and conclusions on this page are those of the Community Preventive Services Task Force and do not necessarily represent those of CDC. Task Force evidence-based recommendations are not mandates for compliance or spending. Instead, they provide information and options for decision makers and stakeholders to consider when determining which programs, services, and policies best meet the needs, preferences, available resources, and constraints of their constituents.

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