



Effective Public Health Practice Project Summary Statement



December 2005

This is a summary statement written to condense the work of the authors of a systematic review. The reference for the full review is below. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.

Reference for Review in APA: Truman, B.I., Gooch, B.F., Sulemana, I., Gift, H.C., Horowitz, A.M., Evans, C.A., Griffin, S.O., Carande-Kullis, V.G., & the Task Force on Community Preventive Services (2002). **Reviews of Evidence on Interventions to Prevent Dental Caries, Oral and Pharyngeal Cancers, and Sports-Related Craniofacial Injuries.** *Am J Prev Med*, 23, (1S), 21-54.

Issue: In 1999, Canadians spent approximately \$6.8 billion dollars on dental care. This translates to a per capita expenditure of \$222.42 per person (1999), up from \$149.42 in 1990 (Baldota et al., 2004). Furthermore, it is estimated that 3200 Canadians will be diagnosed with oral or pharyngeal cancer in 2005, resulting in 1050 deaths. This represents 3%-4% of all cancers and 2%-3% of all cancer-related deaths in Canada (Canadian Cancer Society, 1999; Hawkins et al., 1999).

According to the National Longitudinal Survey of Children and Youth (1994/1995), 14% of injuries to children aged 0-11 were sports-related, many of which were to the craniofacial region. The evidence suggests that sports-related craniofacial injuries presenting to hospital emergency departments are more severe than other sports-related injuries (Kelly et al., 2001; Miller, 2004; Pless et al., 2000).

Review Content Summary: Using a common conceptual approach, three sets of systematic reviews were done to determine the most effective ways to prevent dental caries, oral and pharyngeal cancers, and sports-related craniofacial injuries across all age groups. The review was used to inform recommendations for community water fluoridation and school-based or school-linked pit and fissure delivery programs. There was insufficient evidence to support recommendations for community-wide sealant promotion, population-based interventions for early-detection of oral and pharyngeal cancers or population-based interventions to encourage the use of helmets, facemasks and mouth-guards in contact sports.

Comments on this review's methodology: The reviewers searched Medline for reports of primary studies published in English from 1966 to 2000. Although selection criteria were specified - in terms of interventions, outcomes and design - a substantial number of studies were excluded after eligibility assessment because of "limitations in their execution or design". Data abstraction was performed by two reviewers using a standardised form. The methods for pooling data across studies to determine overall effect, expressed as median change, are not clear. It is not clear if lack of independence of data points was accounted for when multiple measurements for the

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same study were included in the overall estimates of effects. No statistical tests for heterogeneity among studies were reported, but the reviewers did perform subgroup analyses to examine the impact of differences in location and intervention. Although each study was rated as good, fair or limited, no attempt was made to examine variation in effect size related to study quality. Nor was there any attempt to relate effect size to study design.

Evidence points **ARE NOT** weighted or ranked according to strength

What's the evidence?	Implications for practice and policy:
<ul style="list-style-type: none"> > There is evidence to show that community water fluoridation (CWF) programs are effective at reducing the incidence of dental caries within communities. > Among 21 measures of dental caries prevalence in seven before-after studies with concurrent controls, there was a median relative decrease in caries rate of 29% 3-12 years after CWF was started compared to communities without CWF. 	<ul style="list-style-type: none"> > Need to also explore other potentially positive effects of CWF programs, including the reduction of caries risk and experience disparities in different SES groups. Need to measure the effect of the consumption of processed foods/beverages made with fluoridated water on residents in non-fluoridated communities. There is also a sustained need for the promotion of these programs among the general population and some health professionals.
<ul style="list-style-type: none"> > There is evidence to support school-based and school-linked sealant delivery programs as being effective in reducing pit and fissure decay in children's teeth. > In the analysis of school-based/school-linked pit and fissure sealant delivery programs, 10 studies provided 22 measures of caries reduction; the rate of dental caries was reduced by a median of 60% relative to the control group. 	<ul style="list-style-type: none"> > School-based and school-linked sealant delivery programs should be investigated further as a strategy to reduce decay in pits and fissures in children's teeth, using available data where possible. Economic data for the Canadian setting would also help to inform policy decisions about adopting such programs. Special efforts may be needed to promote the adoption of these interventions among the general population, and among school districts with limited resources and limited political support.
<ul style="list-style-type: none"> > There is insufficient evidence to determine the effectiveness of state-wide/community-wide sealant promotion programs in preventing dental caries. > There was only one study of state-wide/community-wide sealant promotion programs identified. 	<ul style="list-style-type: none"> > Need additional research to contribute to the body of evidence so that a conclusion about this intervention's effectiveness can be drawn.
<ul style="list-style-type: none"> > While there is evidence on the effectiveness of population-based interventions for early detection of pre-cancers and cancers, it is insufficient to support a recommendation. > Seven studies were included in the review of prevention/control interventions for oral and pharyngeal cancers. These studies measured the accuracy of interventions, but did not report estimates of effects on the outcomes of 	<ul style="list-style-type: none"> > Need additional research to contribute to the body of evidence so that a conclusion about this intervention's effectiveness can be drawn.

interest to the reviewers, i.e., morbidity/mortality or quality of life.	
<p>> There is insufficient evidence to determine the effectiveness of the use of helmets, facemasks, mouth-guards in contact sports in preventing sports-related craniofacial injuries.</p> <p>> Four prospective cohort studies pertaining to the prevention/control of sports-related craniofacial injuries were identified. While they provided insufficient evidence to inform an overall conclusion, results were consistent with a reduction in dental injuries when full-face shields are used in hockey and mouth-guards are used in rugby or soccer.</p>	<p>> Need additional research to contribute to the body of evidence so that a conclusion about this intervention's effectiveness can be drawn.</p>
<p>General Implications:</p> <p>> There is enough evidence to promote community water fluoridation as an effective method of preventing or controlling dental caries among children and adults.</p> <p>> There is also enough evidence to promote school-based and school-linked sealant delivery programs to reduce pit and fissure decay in children's teeth.</p> <p>> Further high-quality research is needed on the effectiveness of community-wide sealant promotion programs in preventing dental caries, population-based interventions for early detection of pharyngeal and/or oral pre-cancers and cancers and helmet, facemask or mouth-guard use for preventing sports-related craniofacial injuries in contact sports.</p>	

Cost Benefit or Cost-Effectiveness Information:

- *Community Water Fluoridation:* variation in estimated cost, believed to be due to economies of scale. Estimated median cost per person per year ranged between US \$2.70 (populations of 5000 or less) and US \$0.40 (populations greater or equal to 20,000 individuals).
- *School-based and School-linked Pit and Fissure Sealant Delivery Programs:* studies used dental charges for amalgams as a proxy for resources used in treating disease, which overestimates the cost-effectiveness of this intervention. Estimates ranged from <US \$0 to US \$487.
- *The review provided no costing information on the other conditions it covered.*

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