

# Using CPP-ACP products for the caries lesions arrest is not recommended when compared to other non-surgical treatments in adults.

Xiaolu (Lisa) Ma, Tu Anh Nguyen, Xiaoxuan (Tiffany) Wang

Faculty of Dental Medicine and Oral Health Sciences, McGill University, Montreal, QC



Faculty of Dental Medicine  
and Oral Health Sciences

## CLINICAL PROBLEM

According to the World Health Organization, dental caries is the most prevalent chronic disease in the world. It affects 60%-90% of school-aged children. There are different stages in the carious process starting with white spot lesions to cavitated lesions. With more research, clinicians are aiming to find more non-invasive and microinvasive strategies to prevent caries formation and progression. Fluoride is largely studied and well-proven for its preventive properties. However, emerging non-fluoride interventions such as **casein phosphopeptide-amorphous calcium phosphate (CPP-ACP)** have generated much interest, with the goal to manage the carious process and minimize tooth structure loss.

CPP-ACP has emerged as a material of interest, due to its suspected potential to help remineralize and prevent dental caries. Its release of calcium and phosphate ions in the oral cavity may create an ideal environment for remineralization and prevention of caries.

## CLINICAL QUESTION

In caries active adults, to what extent are casein phosphopeptide-amorphous calcium phosphate (CPP-ACP) products effective in caries lesions arrest compared to other non-surgical treatments within at least 12 months of follow-up?

## EVIDENCE SEARCH

**Search date:** January 12, 2022

**PubMed results:** 127 evidence sources

**Additional search:** TRIP Database, C.A.T. Database, ADA EBD Website, Nature Database, Science Direct Journal of Evidence Based Dental Practice  
**Evidence selected:** Clinical Guideline (2018), Systematic Review (2019)

1. Slayton RL, Urquhart O, Araujo MWB, Fontana M, Guzman-Armstrong S, Nascimento MM, et al., 2018, 149(10):837-49 e19.
2. Urquhart O, Tampi MP, Pilcher L, Slayton RL, Araujo MWB, Fontana M, et al. Nonrestorative Treatments for Caries: Systematic Review and Network Meta-analysis. J Dent Res. 2019;98(1):14-26.

## CLINICAL BOTTOM LINE

CPP-ACP **should not be used** as a substitute for fluoride products if they are accessible for arresting or reversing carious lesions of permanent teeth, a statistically significant, clinically meaningful and decisive result.

There was **no benefit to CPP-ACP over placebo/no treatment**, a result that was neither statistically nor clinically significant or decisive.

**When compared to fluoride products, the CPP-ACP is not more effective;** the results are statistically significant and clinically meaningful and decisive.



<https://www.gcaustralia.com/Products/93/Prevention/GC-Tooth-Mousse>

## APPLICABILITY

The applicability of the results is limited by the age group (only children), the location (Australia, Thailand, Germany), and therefore differences in health care systems, risk factors and behaviour in study populations, presence of fluoridated water and follow-up time.

CPP-ACP products such as the Tooth Mousse are easily found in Canadian pharmacies, and can be easily used at home. However, it can be 20 to 50 times more expensive than traditional fluoride toothpaste. This product is contraindicated in those with allergies to milk proteins, benzoate preservatives or soybean derivatives.

More studies on CPP-ACP products in adults with robust methodology and appropriate follow up time are needed.

## RESULTS

### Evidence Quality

- **Evidence 1** - 10% CPP-ACP should not be used as a substitute for fluoride products (certainty: low; strength: conditional).
- **Evidence 2** - The NMA showed that CPP-ACP is not more effective when compared to fluoride products, a statistically significant, clinically meaningful and decisive result (RD = -31.2% [CI 95% -24%, -37.2%]). When compared to no treatment, the use of CPP-ACP is not statistically significant, not clinically meaningful and not precise, and cannot be recommended (RD = 1.8% [CI 95% -6%, 10.8%])
- Patients were followed for any length of time.

### Strengths

- Clear and actionable recommendation based on best current evidence with alternative clearly presented
- Cochrane Risk of bias tool; network meta-analysis
- Comprehensive search conducted with blinded authors
- Strength of recommendation clearly indicated and justified, conflicts of interests minimized through panel configuration.
- Used a PRISMA diagram and the GRADE approach for overall evidence quality assessment

### Limitations

- The parameters of the clinical primary outcome, the follow up period and the population were not clearly defined
- It was unclear how the values and preferences of patients were considered
- No inclusion/exclusion criteria on location, gender, SES, risk factors, comorbidities population, intervention type, length of intervention or length of follow-up, or specific type of clinical setting
- There was a low sample size and a limited number of studies (2-3)
- There was a lack of RCTs with the outcome of interest

## ACKNOWLEDGEMENTS

Faculty mentor(s): Dr. S. Tikhonova  
We'd like to thank Mr. M. Morris for all his help with a search strategy.

