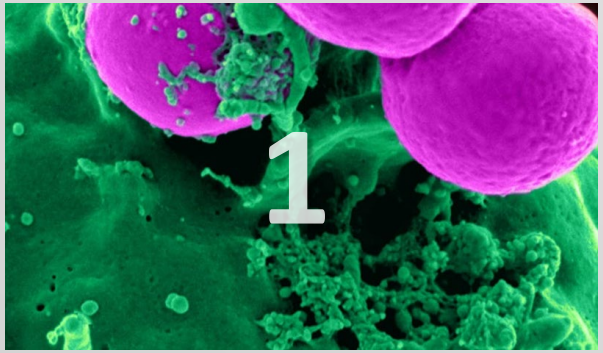
THERE ARE THREE (3) KEYS TO MINERAL LOSS REDUCTION

Stannous Fluoride

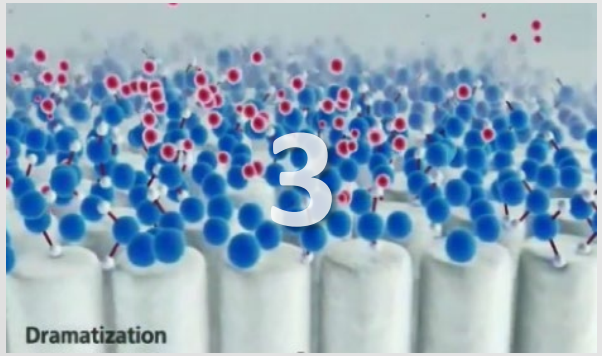


Trap & Remove Bacteria

Reduce the amount of acidic biofilm to prevent subsurface mineral loss

Remineralization

Provide a pro mineral formation environment to reinforce HAP crystals to reverse subsurface mineral loss



Surface Protection

Provide a sacrificial barrier on tooth enamel surfaces to reduce surface mineral loss

Sodium Fluoride

What is ETW?

- Changing dietary habits
- Higher consumption of acidic beverages (colas, sports / energy drinks) – (especially Children and Athletes)
- Higher incidence of xerostomia from medications for chronic conditions Low salivary flow clears acids less quickly (especially Geriatric)
- More people retain teeth for a lifetime, and we are living longer

Interaction between attrition (abrasion) and erosion = Erosive Tooth Wear

DENTAL EROSIVE WEAR

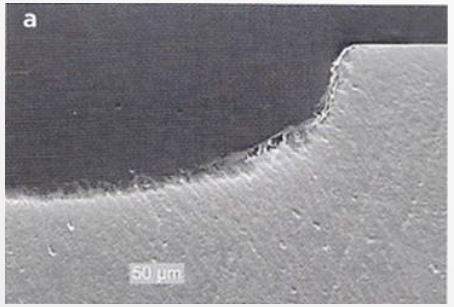
CHEMICAL WEAR & SURFACE MINERAL LOSS

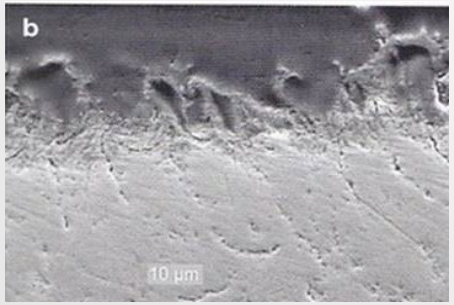
> “Normal tooth brushing has no harmful effect on sound dental tissues. The softened tooth surfaces caused by exposure to acidic products are vulnerable to tooth brushing. However, softened enamel is not remineralized by saliva over short time periods, so will be worn away even in the absence of tooth brushing.[8]”

Intrinsic
Vomiting and GERD

Extrinsic
Consumption of Acidic Foods, Drinks & Carbonated Beverages

Surface Softening Leading to dental erosive wear





Carvalho, T.S., Colon, P., Ganss, C. et al. Consensus report of the European Federation of Conservative Dentistry: erosive tooth wear—diagnosis and management. Clin Oral Invest 19, 1557–1561 (2015). https://doi.org/10.1007/s00784-015-1511-7

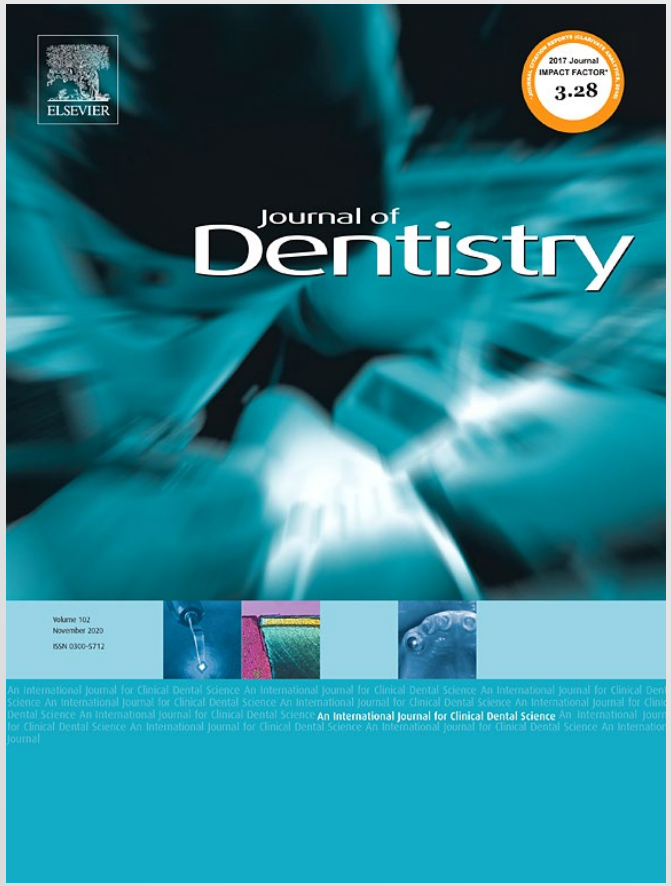
META-ANALYSIS

EROSION

RESULTS

Estimated Average Effect of brushing with Bioavailable Gluconate Chelated Stannous

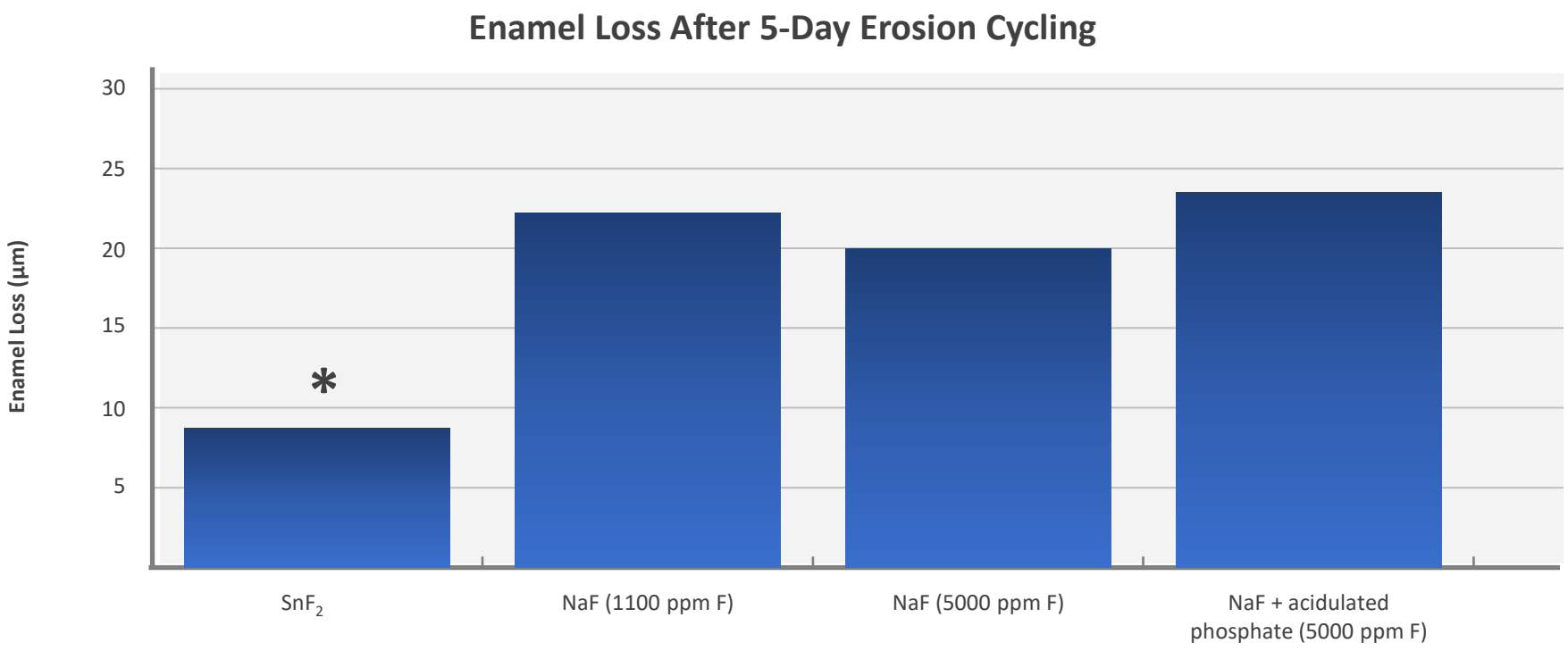
Erosion	83% ↓ Enamel Surface Loss (p<0.001)



West N. et al. Bioavailable gluconate chelated stannous fluoride toothpaste meta-analyses: Effects on dentine hypersensitivity and enamel erosion. Journal of Dentistry, Volume 105, 2021. . https://doi.org/10.1016/j.jdent.2020.103566

Clinical Evaluation of SnF_2 and Erosion Protection–Eversole et al.

SnF_2 was demonstrated to be significantly more effective at reducing enamel loss than all other treatments including two prescription strength sodium fluorides



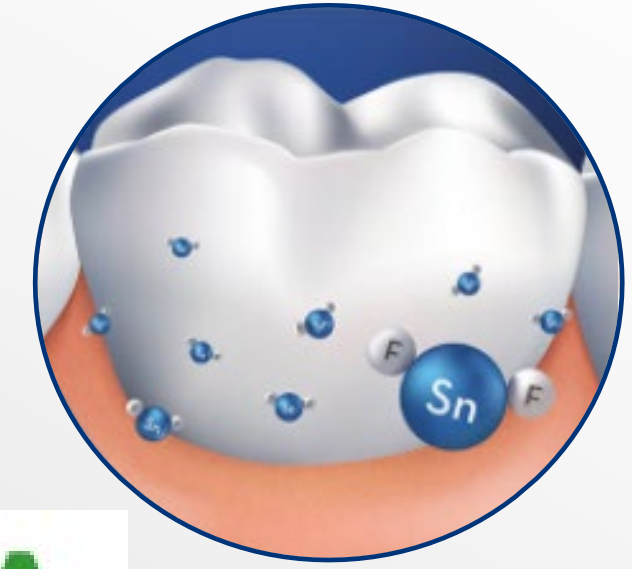
***p<.05 vs. All**

Eversole S, et al. J Clin Dent (2015) 26: 44–49

“ Additional to causal management options, it is possible to use specific protective products or materials. Products (e.g., toothpastes or mouth rinses) containing stannous fluoride or stannous chloride have the potential for slowing the progression of ETW. For other products, data so far are sparse. ”

EUROPEAN FEDERATION OF CONSERVATIVE DENTISTRY

“Preventive strategies are essential as first line management for erosion protection once bulk tooth surface structure is lost, erosive wear is irreversible[12] ”



Crest Is the ONLY dentifrice with the seal for Enamel Erosion Control

ADA

https://www.ada.org/resources/research/science-and-research-institute/ada-seal-of-acceptance/product-search#sort=%40productname%20ascending&f:@category=[Enamel%20Erosion%20Control]

West N. et al. Bioavailable gluconate chelated stannous fluoride toothpaste meta-analyses: Effects on dentine hypersensitivity and enamel erosion. Journal of Dentistry, Volume 105, 2021. . https://doi.org/10.1016/j.jdent.2020.103566

ETW in pediatric population?

A recent global review of mean prevalence of moderate toothwear in deciduous teeth to be between 30-50%; more common in males and increases with age

Damage to permanent teeth in childhood/adolescence may compromise dentition and impact restorative care for lifetime.

Damage will continue until there is an intervention.

KEY FACTS:

ATHLETES[1]:

- **92% regularly consume sports drinks**
- Onset of sports drink use: 10.8 years
- Erosion prevalence: 36.5%

1. Mathew et al Caries Research 2002

European Archives of Paediatric Dentistry

A 12-year-old male with severe erosive lesions affecting the primary and permanent molars. The nutrition diary revealed that the boy consumed more than 1 L of a cola type drink per day

Most common sites were lower 1st molars[2]

2 Arnadottir et al 2010

ETW IS NOT WELL DIAGNOSED

WITHOUT DIAGNOSIS, NO PREVENTION STRATEGY CAN BE IMPLEMENTED

https://www.sciencedirect.com/science/article/pii/S0300571220301706?dgcid=rss_sd_al

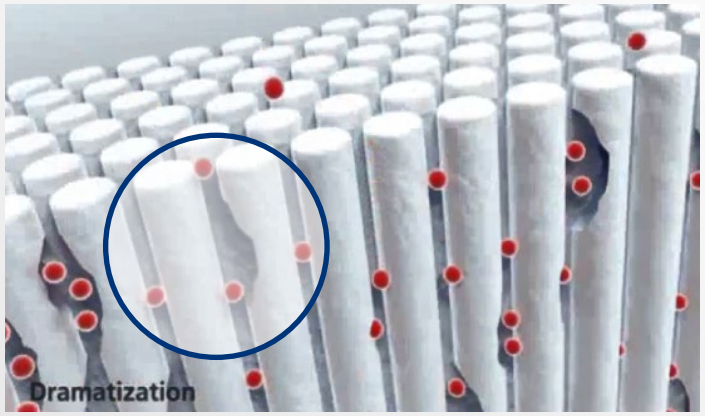
Dentists had difficulty correctly diagnosing (both detection and differentiation) and managing ETW, across all severity levels and particularly in early stages. These difficulties were particularly apparent when compared to caries. The current results are clinically relevant given the importance of early diagnosis for ETW management.

https://bmcoralhealth.biomedcentral.com/articles/10.1186/s12903-017-0451-9

Tooth wear is a relatively new emerging dental public health problem which has not yet raised sufficient awareness among the public. Even dental professionals are not giving sufficient attention to this issue. Most dental professionals overlook the early stages of tooth erosion and dismissed tooth surface loss as something that is ‘normal’ or physiological and thus does not require any intervention [1]. The terms ‘tooth wear’ and ‘dental erosion’ had been used interchangeably by some whilst others used tooth wear as the cumulative effect of abrasion, attrition and dental erosion [2]. In addition, the terms dental erosion and dental erosive wear had often been considered to be synonymous. Huysmans et al. attempted to differentiate the two by defining, erosion as a partial demineralization of enamel or dentine by intrinsic or extrinsic acids and erosive tooth wear as the combined effect of erosion and mechanical wear (abrasion or attrition) on tooth surface [3] with erosion being the dominant process.

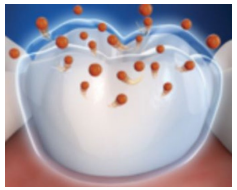
ENAMEL EROSION VS. CARIES

SUB-SURFACE VS. SURFACE MINERAL LOSS



Caries (subsurface phenomenon)	Erosion (surface phenomenon)
Weak acid (e.g. lactic acid)	Strong acid (e.g. citric acid)
Pellicle protects enamel surface	Pellicle can't protect under such harsh acid conditions
Sub-surface phenomenon	Surface damage
Buffering by saliva helps to neutralize	Buffering of saliva is overwhelmed
Reversible in early stages	Irreversible surface damage
A role for treatment of early lesions	Prevention is key for managing the condition

Erosive Toothwear



Dental Erosion results from a demineralization process that is not the result of bacterial acids. Dietary or Medically related acids can overwhelm the natural, pellicle coated tooth surface and induce a surface softening of the mineral and ultimately surface loss of enamel. Once lost, this mineral cannot be restored naturally.

Link	https://pubmed.ncbi.nlm.nih.gov/33383100/	https://pubmed.ncbi.nlm.nih.gov/32259415/	https://rd.springer.com/article/10.1007/s00784-016-1905-1	https://pubmed.ncbi.nlm.nih.gov/26349125/	https://www.dentalcare.com/-/media/dentalcareus/research/pdf/am-j-dent/2011/fallerajdaugust2011.pdf?la=en&v=1-201604260314	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7559150/
Title	Bioavailable gluconate chelated stannous fluoride toothpaste meta-analyses: Effects on dentine hypersensitivity and enamel erosion	Stabilized Stannous fluoride dentifrice in relation to dental caries, dental erosion and dentin hypersensitivity: A systematic Review	Erosion protection benefits of stabilized SnF2 dentifrice versus an arginine–sodium monofluorophosphate dentifrice: results from in vitro and in situ clinical studies	Erosion Prevention Potential of an Over-the-Counter Stabilized SnF2 Dentifrice Compared to 5000 ppm F Prescription-Strength Products	Enamel Protection: A comparison of marketed dentifrice performance against dental erosion	Stannous Fluoride Effects on Enamel: A Systematic Review
Objective	To compare the effect of bioavailable gluconate-chelated stannous fluoride (SnF2) toothpaste with control toothpastes for treatment of dentine hypersensitivity (DH) and enamel erosion.	To review the scientific evidence for the efficacy of stabilized stannous fluoride dentifrice in relation to dental caries, dental erosion and dentin hypersensitivity.	The aim of these investigations was to assess the ability of two fluoride dentifrices to protect against the initiation and progression of dental erosion using a predictive in vitro erosion cycling model and a human in situ erosion prevention clinical trial for verification of effectiveness. (1.5% Arginine)	To determine the relative ability of various F-containing products to protect enamel against the initiation and progression of tooth surface loss due to erosive acid challenges.	To determine the relative ability of various marketed toothpastes formulated with either stabilized stannous fluoride (SnF2), sodium fluoride (NaF), or sodium monofluorophosphate (SMFP) to protect human enamel against the initiation and progression of damage due to dietary acid attack, using a laboratory erosion cycling model.	The objectives of this review are to highlight all the clinical features concerning stannous fluoride reported in the literature and eventually its chemical interactions. In dental patients, what is the effect of stannous fluoride compositions on oral health compared to other dental healthcare products? And as secondary outcome: On enamel and other hard tooth tissue, what is the effect of stannous fluoride composition on their structure compared to other dental healthcare products?
	West N Bioavailable gluconate chelated stannous fluoride toothpaste meta-analyses: Effects on dentine hypersensitivity and enamel erosionJ Dent2021;Feb;105:103566Erosion, Meta-analysis, Stannous	Konradsson K Stabilized stannous fluoride dentifrice in relation to dental caries, dental erosion and dentin hypersensitivity: A systematic review Am J Dent2020;33: 95-105		Eversole SL Erosion Prevention Potential of an Over-the-Counter Stabilized SnF2 Dentifrice Compared to 5000 ppm F Prescription-Strength Products J Clin Dent2015;26:44-49	Faller RV Enamel protection: a comparison of marketed dentifrice performance against dental erosion Am J Dent2011;24(4):205-10	Fiorillo L, Cervino G, Herford AS, Laino L, Cicciù M. Stannous Fluoride Effects on Enamel: A Systematic Review. Biomimetics (Basel). 2020 Aug 31;5(3):41. doi: 10.3390/biomimetics5030041. PMID: 32878006; PMCID: PMC7559150.