

Fluoride in Restorative Materials

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Rationale

- The most common reason for the replacement of restorations is secondary caries.
- Ionic fluoride has an anti-caries activity, can alter the dynamics of the caries process, can modify the dental hard tissues and has an anti-microbial effect.
- The effect of fluoride-releasing restorative materials on the incidence of secondary caries should therefore be further investigated.

Evidence

- Research has been carried out into the release of fluoride from glass-ionomer and resinmodified glass-ionomer cements, resin composites, polyacid-modified resin composites ('compomers'), fissure sealants and amalgam.
- There is substantially more laboratory-based research than clinical research.
- Comparisons between studies are hindered by the lack of common study designs.
- There is equivocal clinical evidence that there is less secondary caries associated with glassionomer cements than with other restorative materials.
- There is negligible clinical evidence that other fluoride-releasing materials are associated with the inhibition of secondary caries.

Future Research

- There is a need for long-term randomized controlled trials on the effect of fluoride-releasing materials on secondary caries.
- There is a need for research to establish the dynamics of fluoride release from such materials.
- There is a need to establish the clinical significance of the fluoride 'recharge' capability of fluoride-releasing materials.

Clinical Significance

- When selecting a restorative material for a specific situation, all properties, including fluoride release, should be considered.
- The success of a restoration depends not only on the choice of material, but also on the skill of the dentist and appropriate caries-preventive measures, including dietary counselling, oral hygiene and exposure to fluoride.

References

- Burke FM, Ray NJ, McConnell RJ. Fluoride-containing restorative materials. *Int Dent J* 2006;56:33-43
- Wiegand A, Buchalla W, Attin T. Review on fluoride-releasing restorative materials – fluoride release and uptake characteristics, antibacterial activity and influence on caries formation. *Dent Mater* 2007;23:343-362