The Use of e-Max Dental Crowns: Safety and Guidelines
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**Acknowledgments:**

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Research Questions

1. What is the clinical evidence regarding the safety of using e-Max crowns for adult patients requiring dental crowns?
2. What are the evidence-based guidelines associated with the use of e-Max crowns for adult patients requiring dental crowns?

Key Findings

Two randomized controlled trials and four non-randomized studies were identified regarding the use of e-Max dental crowns.

Methods

A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. The search was also limited to English language documents published between January 1, 2012 and April 13, 2017. Internet links were provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

<table>
<thead>
<tr>
<th>Population</th>
<th>Adults requiring dental crowns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>e-Max crowns</td>
</tr>
<tr>
<td>Comparator</td>
<td>Q1: Different types of crowns (e.g., gold crowns, porcelain fused to metal crowns [also called metal ceramic], all zirconia crowns, and crowns made from different materials); No comparator</td>
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<tr>
<td></td>
<td>Q2: No comparator</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Q1: Clinical evidence/effect of the e-Max crown on safety (e.g., but not limited to, ability to generate endodontic problems/failure [also termed apical periodontitis], other adverse events), benefits</td>
</tr>
<tr>
<td></td>
<td>Q2: Guidelines (of particular interest is the ability to prevent endodontic failure when using e-Max [e.g., what others dentists are doing with regard to coating or cement used when using e-Max crowns])</td>
</tr>
<tr>
<td>Study Designs</td>
<td>Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, evidence-based guidelines</td>
</tr>
</tbody>
</table>
Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

Two randomized controlled trials and four non-randomized studies were identified regarding the use of e-Max dental crowns. No relevant health technology assessments, systematic reviews, meta-analyses, or evidence-based guidelines were identified.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

Two randomized controlled trials (RCT)\textsuperscript{1-2} and four non-randomized studies\textsuperscript{3-6} were identified regarding the use of e-Max dental crowns. Four studies examined IPS e-Max Press crowns.\textsuperscript{1-2,4,6} There appears to be no difference in performance between e-Max based crowns and comparator crowns\textsuperscript{1-2,4} and no unacceptable rates of complications.\textsuperscript{2,4,6}

The authors of one RCT\textsuperscript{1} examined the use of IPS e-Max Press-in crowns in adolescents with amelogenesis imperfecta compared with Procera crowns. Tooth sensitivity was reduced after crown therapy, but in 3\% of patients, endodontic complications occurred.\textsuperscript{1} There was no difference in quality between the two tested crowns after two years in this population.\textsuperscript{1}

The second RCT\textsuperscript{2} compared mental-ceramic crowns, core ceramic crowns, and core ceramic/veneer ceramic crowns, including IPS e-Max Press core and e-max Ceram Glaze crowns. The rates of secondary caries and tooth sensitivity were examined. There was no significant difference between the crowns in performance and all crowns were rated as “good” or “excellent” for secondary caries and sensitivity.\textsuperscript{2}

Four non-randomized studies were identified.\textsuperscript{3-6} One study\textsuperscript{3} examined the complications and crown survival of various crown implants, including lithium disilicate e-Max crowns. There were no abutment complications and five biological complications after 2.4 years.\textsuperscript{3} The technical complications that occurred were reversible and minor.\textsuperscript{3} The authors of the second study evaluated the outcomes of IPA e-Max Press crowns after nine years of service.\textsuperscript{4} There was no significant difference in survival rate for crowns in different locations, and no difference in the occurrence of complications with differing cementation modes.\textsuperscript{4}

E-Max CAD LT crowns were used in the third non-randomized study.\textsuperscript{5} Out of 41 crowns, four abutment teeth showed signs of biological complications, including a sensitivity change and secondary caries.\textsuperscript{5} These biological complications were within an acceptable range for the crowns and the clinical performance was rated at satisfying.\textsuperscript{5}

The authors of the final non-randomized study\textsuperscript{6} used a prospective design to evaluate long term outcomes of IPS e-Max Press crown-retained fixed dental prostheses. The survival rate of the crown without complications was 91.1\% percent after five years and 69.8\% percent after ten years.\textsuperscript{6} The authors concluded that these crowns may be a safe alternative to metal-ceramic fixed dental prostheses regardless of the cementation process used.\textsuperscript{6}
References Summarized

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses
No literature identified.

Randomized Controlled Trials


Non-Randomized Studies


Guidelines and Recommendations
No literature identified.
Appendix — Further Information

Previous CADTH Reports


Systematic Reviews and Meta-Analyses – Alternate Outcome


Non-Randomized Studies

Alternate Outcome


Case Series


Clinical Practice Guidelines – Uncertain Methodology


Additional References