**Critically Appraised Topic (CAT)**

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| **Project Team:** |
| **8A-5** |
| **Project Team Participants:** |
| **D4 - Steven Fegan, D3 - Stephanie Drake, D2 - Ethan Farr, D1 - Matthew Beck** |
| **Clinical Question:** |
| * **Which dental material has the best clinical outcome for patients needing an anterior bridge?** |
| **PICO Format:** |
| **P:** |
| **Patients needing an anterior bridge** |
| **I:** |
| **Zirconia** |
| **C:** |
| **PFM or Lithium Disilicate** |
| **O:** |
| **Better clinical results** |
| **PICO Formatted Question:** |
| **In patients needing an anterior bridge, does using Zirconia, PFM, or Lithium Disilicate lead to better clinical results?** |
| **Clinical Bottom Line:** |
| **Metal-ceramic FPDs have higher survival rates than all types of all-ceramic FPDs** |
| **Date(s) of Search:** |
| **11/09/2020** |
| **Database(s) Used:** |
| **NCBI PubMed** |
| **Search Strategy/Keywords:** |
| **Ceramics, Dental Restoration Failure, Fixed Partial Denture, Metal Ceramic** |
| **MESH terms used:** |
| **Ceramics, Crowns, Dental Restoration Failure, Humans, Metal Ceramic Alloys** |
| **Article(s) Cited:** |
| 1. **Pjetursson BE, Sailer I, Makarov NA, Zwahlen M, Thoma DS. All-ceramic or metal-ceramic tooth-supported fixed dental prostheses (FDPs)? A systematic review of the survival and complication rates. Part II: Multiple-unit FDPs. Dent Mater. 2015 Jun;31(6):624-39. doi: 10.1016/j.dental.2015.02.013. Epub 2015 Apr 30. Erratum in: Dent Mater. 2017 Jan;33(1):e48-e51. PMID: 25935732.** 2. **Sailer I, Pjetursson BE, Zwahlen M, Hämmerle CH. A systematic review of the survival and complication rates of all-ceramic and metal-ceramic reconstructions after an observation period of at least 3 years. Part II: Fixed dental prostheses. Clin Oral Implants Res. 2007 Jun;18 Suppl 3:86-96. doi: 10.1111/j.1600-0501.2007.01468.x. Erratum in: Clin Oral Implants Res. 2008 Mar;19(3):326-8. PMID: 17594373.** |
| **Study Design(s):** |
| 1. **Systemic Review** 2. **Systemic Review** |
| **Reason for Article Selection:** |
| * Both articles directly address PICO comparison between Zirconia, PFM, and Lithium Disilicate materials * Both articles are systemic reviews with high level of evidence |
| **Article(s) Synopsis:** |
| 1. **Method:** Clinical studies focusing on tooth-supported FPDs with a mean follow-up of at least 3 years were searched on PubMed, CENTRAL, with 10 studies hand included from a previous systemic review. The robust Poisson’s regression model was used to analyze survival and complication rates to obtain summary estimates of 5-year proportions   **Results:** Metal-ceramic FPD survival 94.4%, Zirconia FPD survival 90.4%, Lithium Disilicate FPD survival 89.1%  **Main Complications:** Zirconia- Ceramic fractures & loss of retention, Lithium Disilicate- Framework fracture   1. **Method: Prospective and retrospective cohort studies on all-ceramic and metal-ceramic reconstructions with a mean follow-up time of at least 3 years were searched on MEDLINE and Dental Global Publication Research System along with manual searches. Patients must have been examined clinically at the follow-up visit.  “Assessment of the identified studies and data abstraction was performed independently by three reviewers. Failure rates were analyzed using standard and random-effects Poisson regression models to obtain summary estimates of 5-year survival proportions”**   **Results: Metal-ceramic FPD survival 94.4%, All-ceramic FPD survival 88.6%- Does not differentiate between Zirconia and Lithium Disilicate**  **Main Complications:**   * + **Material fracture Metal-ceramic: between 1.6% and 2.9%, Lithium disilicate: between 6.5% and 13.6%**   + **Biological and technical complications: Zirconia** |
| **Levels of Evidence:** (For Therapy/Prevention, Etiology/Harm)  See <http://www.cebm.net/index.aspx?o=1025>  **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)  **1b** – Individual RCT  **2a** – Systematic Review of Cohort Studies  **2b** – Individual Cohort Study  **3** – Cross-sectional Studies, Ecologic Studies, “Outcomes” Research  **4a** – Systematic Review of Case Control Studies  **4b** – Individual Case Control Study  **5** – Case Series, Case Reports  **6** – Expert Opinion without explicit critical appraisal, Narrative Review  **7** – Animal Research  **8** – In Vitro Research |
| **Strength of Recommendation Taxonomy (SORT) For Guidelines and Systematic Reviews**  See article **J Evid Base Dent Pract 2007;147-150**  **A** – Consistent, good quality patient oriented evidence  **B** – Inconsistent or limited quality patient oriented evidence  **C** – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening |
| **Conclusion(s):** |
| 1. “Survival rates of all types of all-ceramic FDPs were lower than those reported for metal-ceramic FDPs” 2. ”The failure rate of all‐ceramic FDPs after 5 years was 11.4%. The corresponding figure for metal–ceramic FDPs was 5.6%, resulting in a 2.11‐fold higher failure of all‐ceramic FDPs”   If all ceramic restorations must be used, Zirconia should be used rather than Lithium Disilicate |