**Critically Appraised Topic (CAT)**

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| **Project Team:** |
| **4B-4** |
| **Project Team Participants:** |
| **Furquan, Zoe, Payton, Ana** |
| **Clinical Question:** |
| How does the longevity of a PFM crown compare to a FCC or ACC? |
| **PICO Format:** |
| **P:** |
| **Patient needing post crown** |
| **I:** |
| **FCC** |
| **C:** |
| **PFM** |
| **O:** |
| **Longevity** |
| **PICO Formatted Question:** |
| Among patients needing Posterior Crowns, do PFM crowns, as opposed to FCC crowns, offer longer longevity? |
| **Clinical Bottom Line:** |
| * Full cast crowns (FCC) offer superior longevity when compared to both all ceramic crowns (ACC) and porcelain fused to metal (PFM) crowns * PFM crowns offer reliable and long lasting treatment to patients * ACC crowns can serve as a good alternative to PFM and FCC  when esthetics are a concern |
| **Date(s) of Search:** |
| 10/28/20, 11/8/20 |
| **Database(s) Used:** |
| **PubMed** |
| **Search Strategy/Keywords:** |
| PFM, ACC, full cast crown, longevity, posterior |
| **MESH terms used:** |
| Crowns / adverse effects, Dental Porcelain / therapeutic use, Dental Prosthesis Design, Dental Restoration Failure, Gold / therapeutic use, Treatment Outcome, Zirconium / therapeutic use |
| **Article(s) Cited:** |
| N. Passia, S. Sampf. & J.R. Strub (2013). Five-year results of a prospective randomised controlled clinical trial of posterior computer-aided design-computer-aided manufacturing ZrSiO4 -ceramic crowns *Journal of Oral Rehabilitation pp 609-617.*  <https://pubmed.ncbi.nlm.nih.gov/23745725/>  Monaco, C., Llukacey, A., Baldissara, P., Arean, A., Scotti, R. (2017). Zirconia-based versus metal-based single crowns veneered with overpressing ceramic for restoration of posterior endodontically treated teeth: 5-year results of a randomized controlled clinical study. <https://0-pubmed-ncbi-nlm-nih-gov.libus.csd.mu.edu/28736293/>  Canadian Agency for Drugs and Technologies in Health(2015) Porcelain-Fused-to-Metal Crowns versus All-ceramic Crowns: A Review of the Clinical and Cost-Effectiveness  [**https://www.ncbi.nlm.nih.gov/books/NBK304697/**](https://www.ncbi.nlm.nih.gov/books/NBK304697/) |
| **Study Design(s):** |
| **RCT, systemtatic review, and meta analysis** |
| **Reason for Article Selection:** |
| **High levels of evidence and relevant to PICO** |
| **Article(s) Synopsis:** |
| 1. Five-year results of prospective RCT   123 ceramic crowns and 100 gold crowns over a 5yr period   * Survival probability:   + ACC: 98.3% at 6 mo, 73.2% by 5 yrs   + Gold:  99% at 6mo, 92.3% by 5 yrs. * Failure was defined by presence of fracture, caries, need for EXT, and tooth loss.   + Gold crown failure was mostly due to need for EXT or caries   + Ceramic crown failure was mostly due to fracture  1. PFM vs ACC…Review of Clinical and Cost Effectiveness  * Short term survival (< 5ys)   + Takeichi et al. reported survival rates of 95.9% for zirconia-based crowns and 95.4% for PFM crowns   + Burke et al. reported survival rates of 92% for ACC and 93% for PFM crowns * Mid-term survival (5-8yrs)   + Sailer et al. reported 96% for PFM crowns   + all-ceramic crown types; these were feldspathic/silica-based ceramic (90.7%), leucite or lithium-disilicate reinforced glass ceramic (96.6%), glass-infiltrated ceramic (94.6%), densely sintered alumina (96%), densely sintered zirconia (92%), and composite crowns (83.4%).   + Burke et al.[33](https://www.ncbi.nlm.nih.gov/books/NBK304697/) reported lower survival rates for both PFM crowns (76%) and all-ceramic crowns (68%). * Long-term survival (10+ yrs)   + Burke et al. reported a long-term survival rate of 62% for PFM crowns and 48% for all-ceramic crowns  1. Zirconia-bases vesus metal-based single crowns…5yr results  * 5yr RCT comparing longevity and clinical behavior of single posterior crowns made with pressable ceramic on zirconia and on metal frameworks * 72 patients; all teeth endo tx * 90 single crowns; survival assessed at 6mo, 1-4yrs, and 5 yrs * Conclusion: survival of zirconia-based and metal-based single crowns is similar over a follow up period of 5yrs   + “The ECS of the zirconia-based crowns after 5 years (97.73 ± 2.19) was similar to that of the metal-based crowns. (97.44 ± 2.39). In the same way the ECSs of the two groups decreased to 91.11 ± 4.27 and 92.64 ± 4.14 respectively for zirconia- and metal-based crowns. No statistical differences were detected between the two groups.” |
| **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):** |
| If longevity is determined to be the most important factor and highest priority for the patient, then I would recommend treatment using full cast crowns to the D4. Full cast crowns offer the best and most reliable longevity, far outmatching PFM and ACC. PFM and ACC were shown to have similar longevity, with PFM showing slightly more reliable longevity than ACC. |