

D3 PICO

- **Clinical Question:**

- Which material is better for a long span fixed partial denture, porcelain-fused to metal or all-ceramic?

PICO Format

P: Patients replacing multiple teeth with long span fixed partial denture

I: All-ceramic crowns

C: Metal-ceramic crowns

O: More successful restoration

PICO Formatted Question

- In patients replacing multiple teeth with a long span fixed partial denture, which material will make a more successful restoration: porcelain-fused to metal or all-ceramic?

Clinical Bottom Line

Search Background

- **Date(s) of Search:** 11/4/2020
- **Database(s) Used:** PubMed
- **Search Strategy/Keywords:**
 - Fixed Partial Dentures
 - All-ceramic
 - Metal-ceramic
 - Survival
 - Systematic review

Search Background

- **MESH terms used:**
 - Fixed partial denture
 - Fixed dental prosthesis
 - Metal ceramic restorations
 - All-ceramic
 - Porcelain-fused
 - Survival rate

Article 1 Citation, Introduction

- Pjetursson, Bjarni Elvar, et al. "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." *Dental Materials*, vol. 31, no. 6, 2015, pp. 624-639., doi: <https://doi.org/10.1016/j.dental.2015.02.013>
- Study Design: Systematic Review
- Study Need / Purpose: "What are the survival and complication rates of tooth supported FDPs after a mean observation period of at least 3 years? "Are the survival and complications rates of metal-ceramic and all-ceramic tooth-supported FDPs similar after a mean observation period of at least 3 years?"

Article 1 Synopsis

- Method
 - Systematic search of literature published from December 1st, 2006 – December 31, 2013 from the following databases: Medline (PubMed), Embase, and Cochrane Central Register of Controlled Trials (CENTRAL).
 - 40 studies fulfilled inclusion criteria of this systematic review
 - All-ceramic FDPs were further broken down into different compositions:
 - Densely sintered zirconia ceramic FDPs
 - Reinforced glass ceramic FDPs
 - Glass-infiltrated alumina FDPs
- Results after 3 years:
 - Lowest failure rate observed for metal-ceramic FDPs (5.6%)
 - All-ceramic FDP failure rates:
 - Densely sintered zirconia ceramic FDPs: 9.6%
 - Reinforced glass ceramic FDPs: 10.9%
 - Glass-infiltrated alumina FDPs: 13.8%
 - Higher failure rates in all-ceramic FDPs due to parafunctional habits /malocclusion, technical complications , marginal discoloration

Article 1 Synopsis

- Conclusions

- Metal- ceramic FDPs had lower failure rates than all-ceramic FDPs after a mean observation period of at least 3 years
- Drawbacks of all-ceramic compared to metal-ceramic:
 - Framework fractures were commonly reported in reinforced glass ceramic and glass-infiltrated alumina FDPs
 - Densely sintered zirconia is a more stable framework material, but its misfit leads to complications such as marginal discoloration, secondary caries and loss of retention
 - Chipping of ceramics

- Limitations

- Mean observation period was on average 7 years for metal-ceramic FDPs and only 4.7 years for all ceramic FDPs
- Mainly based on studies conducted in university or specialized implant clinics; therefore, long-term outcomes observed cannot be generalized to services provided in private practice

Article 1 Selection

- Reason for selection
 - Directly applied to PICO
 - High level of evidence
- Applicability to your patient
 - Suggests metal-ceramic FDP
- Implications
 - A metal-ceramic FDP may be indicated for this patient due to the span of the FDP as well as the location

Article 2 Citation, Introduction

- Sailer I, Strasding M, Valente NA, Zwahlen M, Liu S, Pjetursson BE. "A systematic review of the survival and complication rates of zirconia-ceramic and metal-ceramic multiple-unit fixed dental prostheses." *Clinical Oral Implants Research*, vol. 29, no. S16, 2018, pp. 184-198., doi: 10.1111/clr.13277
- Study design: Systematic Review
- Study Need / Purpose: "analyze the outcomes, that is, survival rates and technical, biological and aesthetic complication rates of the zirconia-ceramic and/or monolithic implant-supported multiple-unit FDPs, as compared to the golden-standard, the metal-ceramic implant-supported multiple-unit FDPs."

Levels of Evidence

- ☒ **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