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| **Name:** |
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| 4B-4 |
| **Basic Science Question:** |
| What are the differences in the strength of PFM vs. FCC vs. ACC?  |
| **Report:** |
| Looking at the differences between three types of crowns commonly used in dentistry today, it is determined that there is a difference in strength or fracture resistance that comes with each one of them. Porcelain fused to metal (PFM) has been used in dental restorations dating back to the 19th century. Since its introduction into dentistry, PFM materials and design have undergone modification to enhance its overall durability and strength. PFM has become more commonly used due to the aesthetic aspect that it offers, while at the same time maintaining the strength of gold casted crown(2). A PFM crown contains an underlying metal band with porcelain fused over the top of it. By fusing the porcelain over the top of the metal, the bond strength and resistance to fracture is now stronger than the strength the underlying metal alone. There is true adhesion between the two materials meaning that if there were to be a fracture in the crown, it would occur in the porcelain aspect and the metal would stay intact (2). One aspect that is typically a drawback to using these types of crowns is the grey line or appearance by the gum line of the tooth(1). Now, taking a look at an all-ceramic crown (ACC) there is no metal aspect involved, which is the primary reason many lean towards these when aesthetics is a major factor - especially in the anterior teeth. Another aspect to consider is that there are less occlusal surfaces in the anterior as opposed to the posterior. Multiple types of ceramic, such as lithium or zirconia, can be used; each of which in themselves offer different esthetics and physical properties(1). An all-ceramic crown is typically used instead of a PFM when aesthetics are a concern(1). Although they provide a great esthetic, they offer a lower survival rate and are less fracture resistant than a PFM and a FCC(3). Lastly, a full-casted crown (FCC) or a full metal crown is often seen in primary teeth and areas where there are large occlusal forces and less cosmetic concern, such as posterior teeth. FCC’s are a very useful type of restoration. In operative dentistry it is used as a final attempt to restore a tooth and it is also used in prosthetic dentistry for its max retention and strength(4). This being an advantage to those who have clencing and grindings habits (5).An advantage to a FCC is that it is a strong restoration even when very thin meaning it is more conservative and requires very little dentin removal(5). Some have stated that it is the “metallic substitute for enamel”(4) It is a rather durable,long lasting, and is gentle on opposing teeth. A few drawbacks are preparation time, sensitivity, allergic reactions, and potential wear if placed opposite to a full porcelain crown(5). Overall ACC is the least durable whereas FCC is the most durable and has the greatest fracture resistance and strength.  |
| **References:** |
| 1.“ Porcelain-Fused-to-Metal Crowns versus All-ceramic Crowns: A review of the Clinical and Cost-Effectiveness.” Canadian Agency for Drugs and Technologies in Health. 29 May 2015. 2.Hobo, S. and Shillingburg, H. “Porcelain fused to metal: Tooth preparation and coping design”. The Journal of Prosthetic Dentistry.30.1(2006):28-36.3.Kassardijian, V., Varma, S., Andiappan, M., Cruegers, N., & Bartlett,D. “A systemic review and meta analysis of the longevity of anterior and posterior all-ceramic crowns.” 01 September. 2016.4.Selberg, A. “A full Cast Crown Technique.” Journal of Prostehetic Dentistry. January 19575. Rich, M. “ A comparison of Dental Crown Materials” Health Centered Dentistry.  |