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**Comparisons of Indirect Restorative Dental Materials**

<b>TYPES OF INDIRECT RESTORATIVE DENTAL MATERIALS</b>				
COMPARATIVE FACTORS	PORCELAIN (CERAMIC)	PORCELAIN (FUSED-TO- METAL)	GOLD ALLOYS (NOBILE)	NICKEL OR COBALT T- CHROME (BASE-METAL) ALLOYS
GENERAL DESCRIPTION	Glass-like material formed into fillings and crowns using models of the teeth.	Glass-like material that is "enamed" onto metal shells. Used for crowns and fixed bridges.	Mixtures of gold, copper and other metals used mainly for crowns and fixed bridges.	Mixtures of nickel, chromium.
PRINCIPLE USES	Inlays, veneers, crowns and fixed-bridges.	Crowns and fixed-bridges.	Cast crowns and fixed bridges; some partial denture frameworks.	Crowns and fixed bridges; most partial denture frameworks.
RESISTANCE TO FURTHER DECAY	Good, if the restoration fits well.	Good, if the restoration fits well.	Good, if the restoration fits well.	Good, if the restoration fits well.
ESTIMATED DURABILITY (PERMANENT TEETH)	Moderate; Brittle material that may fracture under high biting forces. Not recommended for posterior (molar) teeth.	Very good. Less susceptible to fracture due to the metal substructure.	Excellent. Does not fracture under stress; does not corrode in the mouth.	Excellent. Does not fracture under stress; does not corrode in the mouth.
RELATIVE AMOUNT OF TOOTH PRESEVED	Good-Moderate. Little removal of natural tooth is necessary for veneers; more for crowns since strength is related to its bulk.	Moderate-High. More tooth must be removed to permit the metal to accompany the porcelain.	Good. A strong material that requires removal of a thin outside layer of the tooth.	Good. A strong material that requires removal of a thin outside layer of the tooth.
RESISTANCE TO SURFACE WEAR	Resistance to surface wear; but abrasive to opposing teeth.	Resistant to surface wear; permits the metal to accompany the porcelain.	Similar hardness to natural enamel; does not abrade opposing teeth.	Harder than natural enamel but minimally abrasive to opposing natural teeth. Does not fracture in bulk.
RESISTANCE TO FRACTURE	Poor resistance to fracture.	Porcelain may fracture.	Does not fracture in bulk.	Does not fracture in bulk.
RESISTANCE TO LEAKAGE	Very good. Can be fabricated for very accurate fit of the margins of the crowns.	Good- Very good depending upon design of the margins of the bridges.	Very good- Excellent. Can be formed with great precision and can be tightly adapted to the tooth.	Good-Very good- Stiffer than gold; less adaptable, but can be formed with great precision.
RESISTANCE TO OCCLUSAL STRESS	Moderately; brittle material susceptible to fracture under biting forces.	Very good. Metal substructure gives high resistance to fracture.	Excellent.	Excellent.
TOXICITY	Excellent. No known adverse effects.	Very good. Metal substructure gives high resistance to fracture.	Excellent; Rare allergy to some alloys.	Good; Nickel allergies are common among women, although rarely manifested in dental restoration.
ALLERGIC OR ADVERSE REACTIONS	None.	Rare. Occasional allergy to metal substructures.	Rare; occasional allergic reactions seen in susceptible individuals.	Infrequent; replacement is usually due to recurrent decay around margins.
SUSCEPTIBILITY TO POST-OPERATIVE SENSITIVITY	Not material dependent; does not conduct heat and cold well.	Not material dependent; dies not conduct heat and cold well.	Infrequent; replacement is usually due to recurrent decay around margins.	Infrequent; replacement is usually due to recurrent decay around margins.
ESTHETICS (APPEARANCE)	Excellent.	Good to Excellent.	Poor-yellow metal	Poor-dark silver metal
FREQUENCY OF REPAIR OR REPLACEMENT	Varies; depends upon biting forces; fractures of molar teeth more likely the anterior teeth; porcelain fracture may often be repaired with composite resin.	Infrequent; porcelain fracture can often be repaired with composite resin.	Infrequent; replacement is usually due to recurrent decay around margins.	Infrequent; replacement is usually due to recurrent decay around margins.
RELATIVE COSTS OF PATIENT	High; requires at least two office visits and laboratory services.	High; requires at least two office visits and laboratory services.	High; requires at least two office visits and laboratory services.	High; requires at least two office visits and laboratory services.
NUMBER OF VISITS REQUIRED	Two-minimum; matching esthetics of teeth may require more visits.	Two-minimum; matching esthetics of teeth may require more visits.	Two minimum.	Two minimum.