

Introduction

Preliminary impressions, provisional crown and bridge impressions, study models, registration/opposing dentition impressions, impressions for orthodontic models, sports guards, bleaching trays and more.

Material Selection in Restorative Dentistry

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During the 1960s and 1970s, few dental materials were available for the restoration of carious, fractured or missing teeth. As a result, occlusal forces were sustained using amalgam and gold restorations. Although these restorations provided an extremely functional restoration, creation of an esthetic form from a patient perspective was often difficult.

Biomaterials science is in the midst of the largest transition in history. Significant advances have occurred in the development of both direct and indirect tooth-colored restorative materials. With this transition has come a paradigm shift in material selection. Patients are demanding tooth-colored restorative materials. These materials have had an undeserved poor reputation. This has been largely due to improper clinical manipulation and not to the material itself. Attention to detail and precise clinical

manipulation will result in longevity of these restorations, which rival the traditional metallic restorative materials.

As the evolution of materials and technology continues, dental education will require modification in order to incorporate the changes suitably into the curricula.¹ Dental schools will need to adopt a more flexible and dynamic curriculum that emphasizes basic sciences and principles rather than a specific technique. Emphasis will need to be on clinical manipulation rather than memorizing compressive and tensile strength values.

Teaching critical thinking skills is imperative if newly graduated dentists are to avoid the pitfalls of relying too heavily on manufacturer-driven data. Manufacturers readily provide data regarding strength and a variety of other properties. At times, they also provide the results of short-term clinical trials. How reliable is that information? More importantly, how useful is it? It

has been the goal of many dental materials scientists to predict the clinical performance of dental materials based on physical properties.

Unfortunately, success has been elusive. We know today that improvements in physical properties alone are not good predictors of clinical performance. Clinical trials are the most reliable source of information. One must also ask the question of how long should a clinical trial be before one accepts the conclusions. The dynamics of dental materials testing is such that by the time experimentation is complete, a new product is ready to be launched. This creates a vicious cycle of not enough data vs. no data. How does the practicing clinician



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make a choice? If we look at the literature on longevity of all ceramic crown systems, it is a basic fact that sufficient data is not available to the clinician until many years after a system is introduced to the profession.

Clinicians wishing to utilize new systems in the absence of clinical data should proceed with caution. Systems should be analyzed in terms of their ability to provide improved esthetics and their potential for longevity. Experts in the field should be consulted, and a thorough knowledge of the system requirements (preparation design, requirements for bulk reduction, margin geometry, etc.) should be obtained from the manufacturer. It would seem prudent to then use the system (with

the appropriate informed consent) in a few patients, and then to observe the results before placing a large number of such restorations. Placing large numbers of essentially experimental restorations is unfair to patients and potentially very expensive for the clinician.²

The profession will be more dependent on continuous updates and accumulated experience in order to remain current, and to subsequently provide the population with the benefits of high-tech materials and treatment methods.

In this issue, Dr. Pascal Magne will critically evaluate material choices for posterior restorations. Drs. Tae Kim, Terry Donovan and I will discuss the decision-making process in choosing a luting agent. Dr. Donovan also will look

at the longevity of the tooth restoration complex and the factors the clinician needs to take into account prior to choosing a restorative material.

My intention with this issue is to stimulate critical thinking and to inspire readers to challenge manufacturer-driven data so that appropriate materials are selected and patients given the best possible care. **CDA**

References / 1. Nathanson D, The impact of biomaterials and research on dentistry. *Pract Periodontics Aesthet Dent* 12(1):68,70, January-February 2000.

2. Donovan TE, Cho GC, The role of all-ceramic crowns in contemporary restorative dentistry. *J Calif Dent Assoc* 31(7):565-9, July 2003.