

## Ceramic – Commercial Development and Marketing of an Essential Material

Patricia Uribe Vargas<sup>1,2,3\*</sup>

<sup>1</sup>Prosthodontics, Universidad San Martin, Bogota, Colombia

<sup>2</sup>Esthetic and Oral rehabilitation, NYU, College of Dentistry NY, USA

<sup>3</sup>Implantologists, EIRO, Buenos Aires, Argentina

**\*Corresponding Author:** Patricia Uribe Vargas, The Beauty Smile<sup>®</sup>, Bogota, Cundinamarca, Colombia.

**Received:** February 22, 2018; **Published:** May 15, 2018

Dental ceramics have individual features with regard its structure, composition, properties, manufacturing protocols, clinical indications, and marketing. In view of the expanding amount of ceramic material options available on the market, the dentist needs to understand several essential concepts. Extensive information is available mainly on ceramics but rarely dentists are willing to learn about its characteristics, and processes in order to have those materials available on the market. Therefore, this article is focused on the methods of development and steps to get ceramic materials into our daily practice. Industrial and commercial aspects of ceramic material are not so known for dentists, so the importance having it available should be appreciate for such important and necessary material.

### Materials Selection

Constantly new ceramic materials are developed; when a dental treatment is planned and it includes a placement of veneers, crowns, inlays, onlays, endocrowns or any implant restoration, it is almost 95% mandatory to include any kind of dental ceramic, not many dentists know the importance of material election according to the clinical requirements, and it is left to the technician, but nonetheless it is know how it is reaching the dental marketing to be used for the dental clinics.

### Development of new ceramic materials

The development of dental technology and materials has advanced at an accelerated pace in recent years. Changes and advances in these areas are influenced by the constant evaluation of new trends, changes and market needs and the objectives of patient care [1].

Every day, with the evolution of clinical needs and requirements, there is a tendency to create new materials that meet the needs of the dental laboratory, the restorative dentist and the patient [2].

A complex and multifaceted process, the development of products that include ceramic materials spans years, from the conception of ideas to the creation of a prototype and from the moment in which the production methods are improved until the studies complete its validation.

The sequential efforts that are carried out to bring new products and ceramic equipment to the market represent significant commitments of scientists, chemists and engineers throughout the cycle of their development. These efforts should also account for the perspectives of end users and academics, all of whom are interested in how concepts are realized in practical applications and, of course, in patients. In addition, meticulous studies are carried out by independent and internal researchers to validate the effectiveness and safety of new ceramic materials [3].

Time and studies affect the cost of research and product development. The delivery of ceramic products, equipment and processes that drive the profession require innovation, satisfying specific needs and expectations. Ultimately, it requires the delivery of ceramic products and processes that are good for the progress of the dental profession and industry and, most importantly, beneficial for patients [4]. For these combined reasons, theoretically good and potentially useful innovations may not come to fruition. When the cost of research and development of a product cannot be justified by the opportunities for financial and clinical benefits, then the choice to make a different product or innovation is made.

As a result, to ensure that raw materials and product components meet the specified requirements, dental product manufacturers require vendors and suppliers to engage in rigorous qualification and evaluation processes to provide a high level of safety that they can satisfy the manufacturer's needs [5]. Some manufacturers of dental products perform this due diligence based on the risk analysis or evaluation of several key factors. These include the criticality of the product or material that a supplier is supplying and how much control a manufacturer will need about it. After the selection of the supplier, a quality inspection may also occur upon receipt of the materials to ensure compliance with the specifications, after which the subsequent specifications of the product's processing are applied and validated by ongoing tests [6].

Regulatory requirements require that evidence be provided to document that different stages in the entire production process, including device packaging and labeling, have been independently verified and released (i.e. reviewed during production as compared to the specifications of each component and production phase). This process protects the likelihood that all aspects of a product or material meet all specifications before being introduced to the store.

Although there is always pressure to meet the deadlines for a proposed market launch schedule, both the manufacturer and the professionals who use their products are best served if extensive and reliable information is available [4].

When manufacturers follow the project and product management phases described above, controls and balances are inherently applied in order to ensure quality, efficiency and safety. The university and independent evaluation groups focus on their key criteria for the success of materials and equipment. By carrying out validation studies and providing information that guides the final development of a product, manufacturers and their partners establish the quality, relevance and performance of the product [7].

Standardized *in vitro* tests and calibrated clinical trials conducted under strict conditions represent other mechanisms in the quality assurance process that demonstrate how products and equipment will function in a generalized dental practice or laboratory environment. Even when they are funded by the manufacturers, research in independent universities and facilities can be relied upon, particularly when the nature of the sponsorship is fully disclosed [1].

Once a product is introduced to the market, additional scientific research based on evidence can be conducted. Of course, the availability of reliable and reliable information is based on the proper use of materials and equipment, according to the manufacturer's intrusions.

### Quality Value

In recent years, a trend among some manufacturers of dental products and equipment has been to introduce products to the market before they have been thoroughly tested. However, leading manufacturers of ceramic materials adhere to rigorous protocols to ensure that their products are tested and evaluated before release. That is why it is very important to know the properties and characteristics of each ceramic material, know its benefits and weaknesses, and thus when choosing the material for the restoration with ceramic veneers, and so our prosthetists will be guaranteeing 50% of the success of the treatment, the remaining 50% will depend on the choice, classification of the case, its respective cementation and adjustment of occlusion and obviously of the skills of the operator [1,4].

### Bibliography

1. Stephens MB, *et al.* "Adult learning models for large-group continuing medical education activities". *Family Medicine* 43.5 (2011): 334-337.
2. Malament KA and Grossman DG. "The cast glass-ceramic restoration". *Journal of Prosthetic Dentistry* 57.6 (1987): 674-683.
3. Anusavice KJ. "Standardizing failure, success, and survival decisions in clinical studies of ceramic and metal-ceramic dental prostheses". *Dental Material* 28.2 (2012): 102-111.
4. Reiss B. "CSA: The online portal for determining the clinical standing of ceramic restorations in practice". *International Journal of Computerized Dentistry* 14.3 (2011): 243- 253.
5. Lawn B, *et al.* "Materials design in the performance of all-ceramic crowns". *Biomaterials* 25.14 (2004): 2885-2892.
6. Malament KA and Socransky SS. "Survival of Dicor glass-ceramic dental restorations over 20 year: Part IV. The effects of combinations of variables". *International Journal of Prosthodontics* 23.2 (2010): 134-140.
7. Phillips RW. "Skinner's Science of Dental Materials, edition 9". Philadelphia: Saunders (1991).

**Volume 17 Issue 6 June 2018**

**©All rights reserved by Patricia Uribe Vargas.**