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The State-of-the-Art in Impression Materials

(Roundtable discussion)

The average practitioner takes approximately one crown or bridge impression per day, for a total of 20-30 per month. An impression is simply a process whereby the dentist can indirectly transfer information from the patient's mouth to the lab technician's bench. Ideally, if the transfer process is accurate the restoration will fit well, requiring little or no chairside adjustment.

Innovative and effective impression materials remain the foundations of the successful restorative practice, and the associated technologies have made major advances over the last decade. Many of these developments have received little notice, however, as the profession's attention was firmly focused on adhesion, composites, ceramics and implants.

Oral Health convened a panel of five leading clinicians and academics to discuss the current state of the art in impression materials. The panel consists of **George Freedman** — Markham ON (Past president of the Am-

erican Academy of Cosmetic Dentistry and the Chairman of the Clinical Innovations Congress, London, United Kingdom), **Howard Glazer** — Fort Lee NJ (Past president of the Academy of General Dentistry and the Deputy Chief Forensic Dental Consultant to the Office of Chief Medical Examiner, City of New York), **Karl Leinfelder** — Chapel Hill NC (Professor Emeritus at the University of Alabama and Adjunct Professor at the University of North Carolina), **Ross Nash** — Charlotte NC (Co-founder and Director of Ross Nash Seminars and a faculty member at The Medical College of Georgia, School of Dentistry in Augusta) and **Andrew Shannon** — Vancouver, BC (Founder of the Northwest Aesthetic Restorative Continuum and Mentor to the Aesthetic Continuing Education Study Club).

ORAL HEALTH: *What is new and great in impression materials?*

Glazer: Ultrafast intraoral setting times — 90 seconds or so for Flexitime Xtreme (Heraeus) and Exafast NDS (GC). They are great

for single units, great for gaggers.

Nash: I like to use the polyvinyls: heavy tray with the light body. The tray material is best mixed by machine dispensers which load trays effortlessly. There is no stress on the assistant's hands.

Leinfelder: Impression materials today are more reliable and faster. Generally, most are far less technique sensitive than earlier products.

Freedman: The Thermosense property built in to the Flexitime family allows a stress-free impression session. The Flexitime impression material begins to set in earnest only when it is inserted into the patient's mouth (initiated by body temperature). Of course, the working time is not unlimited but it is certainly more forgiving.

Nash: Polyvinyls will give you good impressions just about every time. I use the faster setting materials even with the full arch trays — just remember that you have to be organized, prepared,

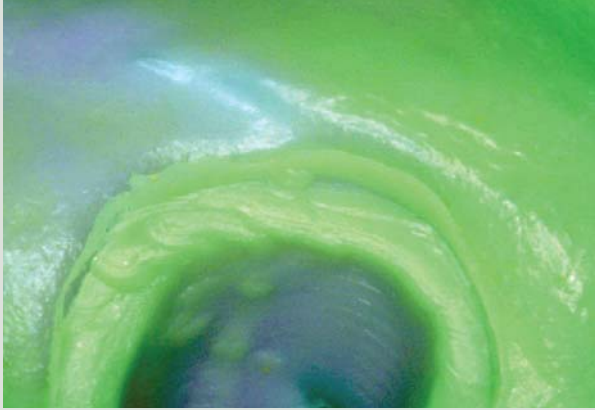


FIGURE 1



FIGURE 2

and that you have to keep the process moving.

Shannon: I like the faster setting time of the newer materials like Flexitime Xtreme and Take 1 Fast Set. They provide excellent and durable impressions that can be poured multiple times with continued good marginal accuracy, even one to two weeks later.

Glazer: The hybrid polyether/polyvinyl materials such as Senn (GC) offer great promise. Zhermack's nanotechnology impression materials, Elite H-D+ have tremendous properties. The P2 polyether (Heraeus) has all the benefits of this category without the foul taste and odor.

Freedman: Some of the newer polyvinyls have a resin component. This typically allows them to polymerize and harden even in the presence of moisture or other fluids. Elite H-D+ (Zhermack) and Flexitime impressions will actually polymerize accurately even if completely underwater! This property facilitates impression taking in the chronically wet environment of the human mouth, and makes the process predictable and worry-free.

Leinfelder: These newer impression materials exhibit a far greater moisture tolerance than even thought possible. The moisture does not affect their setting,

accuracy, or durability.

ORAL HEALTH: What makes these impression techniques better, faster, and easier?

Leinfelder: The innovative chemistry is created by the additives that are incorporated into impression materials. They are more hydrophilic and the practitioner has direct control over the setting times. The improved rheology makes impression taking a far more predictable process than ever before.

Nash: A fast set is more comfortable for the patient. It is also more efficient for the practice, if you do it right the first time that is. And these newer materials help you get it right every time.

Freedman: Believe it or not, patients do not enjoy keeping their mouths open with full impression trays for 5-6 minutes or more. Try it yourself some time. The faster the impression material is in and out of the mouth (assuming, of course, that we are not sacrificing accuracy) the better it is for all concerned.

Glazer: The faster impression materials are specifically designed for the single units that make up 80% of our indirect practice. These materials make it easier to treat gaggers.

Shannon: Faster impressions mean less stuff in the mouth for a shorter period of time. What's not to like? Automix cartridges give a perfect mix and consistency every time. Flexitime's consistency makes it very easy to extrude.

Nash: Rubber base was awful; it was messy, smelled bad and tasted worse. Today's polyvinyls are totally comfortable. I also prefer polyvinyls to polyethers because they do not set as hard, and their flex makes them easier to remove after polymerization.

Shannon: The variable curing times that are available give me complete control over impression material placement: fast and furious for single units, and longer and non-stressful for full arch impressions. These innovative impression materials are more predictable, more accurate, and more productive.

Glazer: Some impression materials include aromatic oils to make them even more palatable for patients.

Freedman: The past decade has brought impression materials that are better in terms of accuracy and most other properties. These materials are faster setting for greater comfort and practice efficiency. They are less technique sensitive and work in the moist

oral cavity, making them easier to use for the dentist and the staff.

ORAL HEALTH: *What is in the future for impression materials?*

Shannon: 3M has just purchased Brontes Technologies, a company that is developing digital scanning that can replace impression taking.

Freedman: The Cerec technology that has been available for years is in fact a digital process whereby 3-dimensional data can be collected optically and processed into solid geometry. Cerec also includes design software and a milling apparatus. It is not a major step to adapt this science to a lower cost, simplified data gathering device.

Nash: Light-cured impression materials may reappear as re-

search fine tunes the process. I would like to see pre-loaded impression trays that can be activated by an external source or stimulus. Clear, cure-through impression materials for provisionals will make those procedures much easier.

Glazer: A device that acquires digital imaging data optically from in and around the preparation, developing a 3-dimensional model, will simplify impression taking.

Leinfelder: Whether the future for impressions will be electronic (digital scanning) or mechanical (improved impression materials), moisture control will still be a concern. Effective tissue packing and retraction will still be required to expose the margins clearly. The basic parameters for successful restorative dentistry

are similar no matter which impression technique is used.

Shannon: The logical conclusion to impression materials is no impression materials at all. Digital scanning will replace the mess and the uncertainty. Digital imaging will not only be accurate and fast, but it will provide immediate visual and analytical feedback such that any impression that is not perfect will simply and quickly be retaken before the patient leaves the chair.

Today's innovative impression materials are truly exciting and a great improvement on their predecessors. While current progress is rapid and even accelerating, the future of impression materials may involve no impression materials at all.

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