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dentisterie restauratrice et de prosthodontie

Publication officielle de l'Académie canadienne
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VOLUME 3 - 3
SUMMER / ÉTÉ 2010

PEER-REVIEWED -
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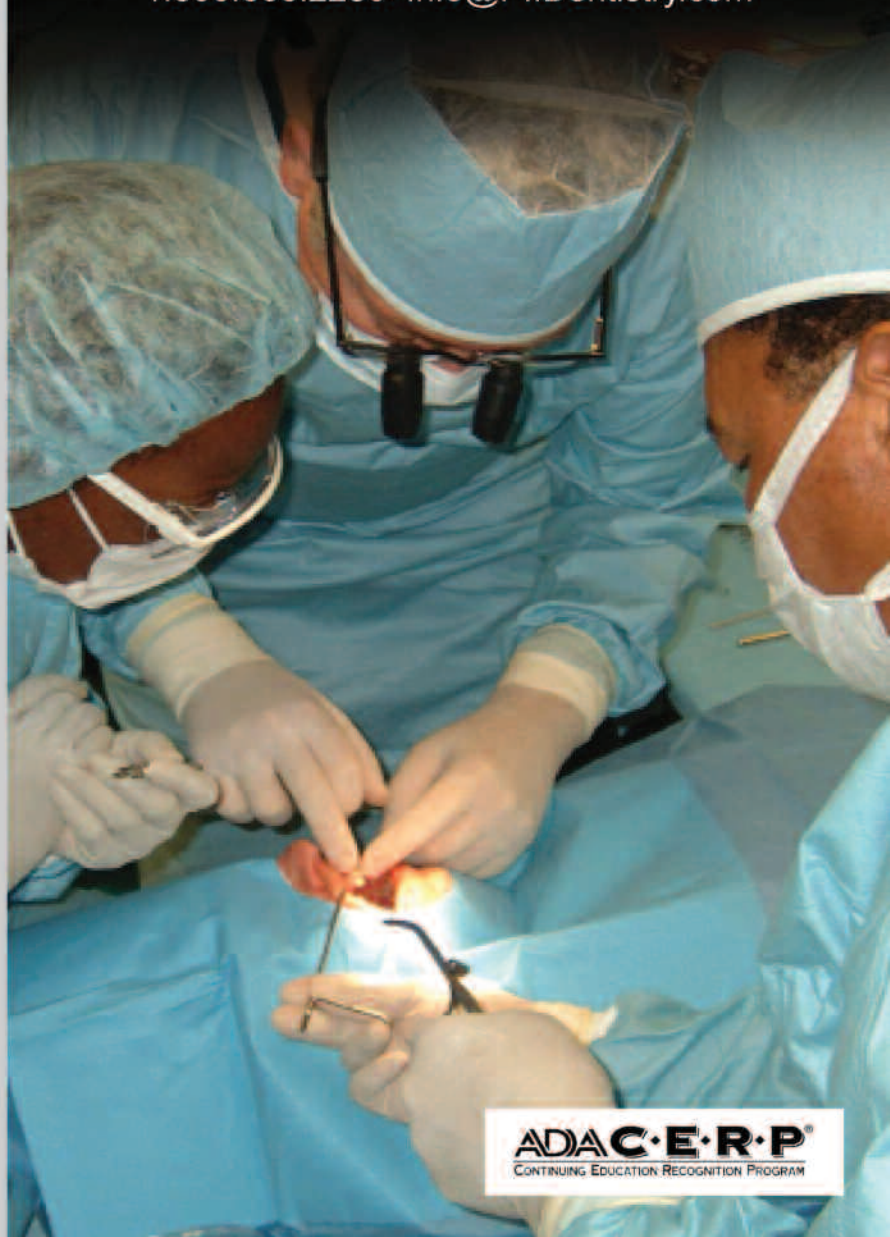

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Canadian Journal of
Restorative Dentistry & Prosthodontics
Journal canadien de
dentisterie restauratrice et de prosthodontie

VOL 3, NO.3 • SUMMER / ÉTÉ , 2010

Official Publication of the Canadian Academy of Restorative Dentistry and Prosthodontics

Publication officielle de L'Académie canadienne de dentisterie restauratrice et de prosthodontie

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PUBLICATIONS AGREEMENT NUMBER 40025049
ISSN 1916-7520

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Dental Industry Research: Challenges and Solutions

Understanding dental industry research can be quite perplexing since few dental journals or other sources offer enlightenment on corporate modus operandi. For this issue of *CJRDP*, we've invited industry leaders to seize the opportunity to elucidate on the matter and we salute Dr. Alfred Viehbeck, PhD, from the 3M ESPE Corporation, for his article contribution describing how product innovation and development is achieved from the "fuzzy front-end" to the clinicians' operatories. The author underlines evidence-based dentistry in the following terms: "The ever increasing avalanche of new information and increasing public expectation and demand for successful clinical outcomes from dental services are driving the need for evidence-based dentistry." This is most reassuring as it cautions us to choose innovations for our practice based on solid evidence. The Cochrane Database of Systematic Reviews (www.ohg.cochrane.org) that I mentioned here once before, states that there are numerous products, clinical procedures, and technologies in mainstream practices that lack substantiation through Randomized Clinical Trials (RCT). A case in point is Dr. Frank Spears' Perspectives on "The Risk of the Metal-Free Practice"[1] regarding the cost of remakes due to the dearth of solid clinical evidence.

The greatest challenge for Clinical Dental Research is conducting RCTs that meet the CONSORT (Consolidated Standards of Reporting Trials) methodology. Industry, as Dr. Viehbeck emphasizes, *must* at some point turn towards the practitioners to gather its evidence-based data. Academia, in my experience and observation, has abstained from involving itself with RTCs by demanding unrealistic budgets from the industry, thereby undermining its own credibility in the field of clinical research. The message sent to industry, and to the profession at large, is one of non-collaboration and non-affiliation. Such a gap has left clinicians stranded with regard to evidence-based clinical dentistry.

The solution? It lies within our own community of practitioners. As health care professionals, we are entitled to develop the means to properly meet our obligations. A practical example is the Canadian Dental Research Institute (CDRI, www.cdri-icrd.ca), a not-for-profit, national corporation and recognized university and public research entity *eligible for R&D Tax credits* since 1992. Its mission is to welcome the initiatives of the profession/industry/academe and promote health care research. In 1997, the Order of Dentists of Québec, in a ruling supporting the CDRI, acknowledged that clinicians could receive financial compensations from patients for their clinical research work. Self-appointed detractors of research institutes such as the CDRI have been perpetuating disinformation as well as the status quo in the paucity of evidence-based clinical dentistry as they staunchly absolve themselves of their responsibilities in the field of clinical research.

In this issue, Dr. Begüm Akkayan, et al., are presenting in vitro data regarding "The Effect of Post Geometry on the Resistance to Fracture of Endodontically Treated Teeth with Oval-Shaped Root Canals." As prefabricated post systems are more commonly used, it is beneficial to consider the fracture resistance limitations that exist between root forms and the post geometry of various systems. Dr. Akkayan's graduate program students were also involved in this

second contribution to our *Journal*. We thank her for this initiative. As an aside, our best wishes go to Dr. Hasan Alkumru in his new academic career at the Dental Faculty of the University of Toronto.

Dr. Allan Coopersmith's article on the Custom Impression Coping, reveals his pragmatic and innovative clinical approaches. I encourage Dr. Coopersmith to foster comparative clinical trials in this field and to further disseminate his valuable knowledge in fixed prosthodontics.

Welcome, colleagues from India! Dr. Preeti Kumar and collaborators are reviewing literature on the topic of "Mouth Guards: Performance Aids or Expensive Placebos?" This article is a valuable reminder that once our treatments are completed, a preventive appliance is indicated in most cases.

Ms. Jo-Anne O'Connor-Weber's third article in her series on practice management brings readers to focus on case acceptance. The author underlines the elements in your practice that are contributing to case acceptance, the related business areas that need to be addressed and how to find the appropriate solutions for increasing case acceptance in your practice.

This issue will find us reunited as an academy at our Annual Scientific Meeting in Calgary. Our best wishes and gratitude go to Dr. Ed McIntyre, meeting chair, to his associates, and to our meeting sponsors for an excellent program. A most productive and enriching experience awaits us all in October.

Dr. Hubert Gaucher
Editor-in-Chief

Reference

1. Spears FM. Perspectives. J Esthet Restor Dent 2009;21(2):71–74.

MESSAGE DU RÉDACTEUR EN CHEF

Recherche dentaire industrielle : Défis et solutions

La recherche dans l'industrie dentaire peut sembler quelque peu mystérieuse pour qui cherche à comprendre, étant donné que peu de journaux ou autres sources dans le domaine dentaire apportent des éclaircissements sur le mode de fonctionnement de l'industrie. Pour ce numéro du JCDRP, nous avons invité des chefs de file de l'industrie à profiter de l'occasion pour élaborer sur le sujet et nous remercions le Dr Alfred Viehbeck, PhD, de la Société 3M ESPE, dont l'article explique comment l'innovation et le développement des produits sont réalisés depuis le « début plutôt vague » jusqu'aux cabinets dentaires des cliniciens. L'auteur décrit la dentisterie fondée sur des preuves (evidence-based dentistry) dans les termes suivants : « L'avalanche de plus en plus importante d'informations et les attentes et les demandes croissantes du public concernant des résultats cliniques couronnés de succès de la part des services dentaires ont créé le besoin d'une dentisterie fondée sur des preuves ». Ce point de vue est fort rassurant puisqu'il nous encourage à choisir l'innovation basée sur de solides preuves dans notre pratique. La base de données des revues systématiques du groupe Cochrane (www.ohg.cochrane.org), dont j'ai fait mention ici précédemment, indiquent que de nombreux produits, procédés cliniques et technologies dans les activités courantes de la dentisterie ne sont pas corroborés par des essais cliniques aléatoires (ECA). Un exemple confirmant cette idée est la perspective du Dr Frank Spears sur « Le risque d'une pratique sans métal »[1] concernant le coût de réfections en raison du manque de solide preuve clinique.

Le plus grand défi de la recherche dentaire clinique est de diriger des ECA qui sont compatibles avec la méthodologie du groupe CONSORT (Consolidated Standards of Reporting Trials). L'industrie, comme le souligne le Dr Viehbeck, *doit* à un moment donné se tourner vers les praticiens pour recueillir ses données fondées sur des preuves. L'université, selon mon expérience et mon observation, s'est abstenue de s'engager elle-même relativement aux ECA en demandant des budgets irréalistes à l'industrie, et de là a miné sa crédibilité en matière de recherche clinique. Le message envoyé à l'industrie, et à la profession en général, est un message de non-collaboration et de non-affiliation. Une telle lacune a laissé les cliniciens en plan relativement à la dentisterie clinique fondée sur les preuves.

La solution? Elle se trouve dans notre propre communauté de praticiens. En qualité de professionnels de la santé, nous sommes habilités à mettre en place les moyens de satisfaire à nos propres obligations. Un exemple concret est l'Institut canadien de recherche dentaire (ICRD, www.cdri-icrd.ca), une société nationale sans but lucratif universitaire et de recherche publique *éligible*

aux crédits d'impôt à la recherche depuis 1992. Sa mission consiste à recevoir les initiatives de la profession, de l'industrie et du milieu universitaire et de promouvoir la recherche en soins de santé. En 1997, l'Ordre des dentistes du Québec, dans une décision appuyant l'ICRD, a convenu que les cliniciens pouvaient recevoir des indemnités financières de la part des patients pour des travaux de recherche clinique. Des détracteurs autodésignés d'instituts de recherche comme l'ICRD ont propagé la désinformation et maintenu le statu quo quant à la carence de la dentisterie clinique fondée sur des preuves, en s'exemptant eux-mêmes avec vigueur de leurs responsabilités en matière de recherche clinique.

Dans ce numéro, le Dr. Begüm Akkayan et divers collaborateurs présentent des données *in vitro* concernant « L'effet de la géométrie de pivots radiculaires préfabriqués sur la résistance à la fracture de dents traitées par endodontie avec des canaux radiculaires de forme ovale ». Étant donné que les systèmes de pivots radiculaires préfabriqués sont plus couramment utilisés, il est avantageux de tenir compte des limites de résistance à la fracture qui existent entre les formes radiculaires et la géométrie des pivots radiculaires de divers systèmes. Des étudiantes inscrites au programme d'études supérieures du Dr Akkayan ont également participé à cette deuxième contribution à notre *Journal*. Nous la remercions de cette initiative. En passant, nos vœux de réussite au Dr Hasan Alkumru dans sa nouvelle carrière à la faculté dentaire de l'Université de Toronto.

L'article du Dr Allan Coopersmith sur la « CIC » (Custom Impression Coping) révèle ses approches cliniques pragmatiques et innovatrices. J'encourage le Dr Coopersmith à favoriser les essais cliniques comparatifs dans ce domaine et à continuer à transmettre ses précieuses connaissances en prosthodontie.

Bienvenue, collègues de l'Inde! Le Dr Preeti Kumar et ses collaborateurs passent en revue la documentation sur le sujet suivant : « Protecteurs buccaux : aides efficaces ou placebos coûteux? ». Cet article intéressant nous rappelle qu'à la fin de nos traitements, un appareil préventif est indiqué dans la plupart des cas.

Le troisième article de Mme. Jo-Anne O'Connor-Weber de sa série sur la Gestion de Cabinet attire l'attention des lecteurs sur l'acceptation de cas. L'auteur souligne les volets de votre pratique qui contribuent à l'acceptation de cas, les éléments d'affaires connexes qui doivent être abordés et la façon de trouver les solutions appropriées pour accroître l'acceptation de cas dans votre pratique.

Ce numéro coïncidera avec notre réunion en qualité d'académie à notre réunion scientifique annuelle à Calgary. Nos meilleurs vœux et l'expression de notre gratitude au Dr Ed McIntyre, président de la réunion, à ses associés et à nos commanditaires de la réunion pour un excellent programme. Une expérience fort productive et enrichissante nous attend tous en octobre.

Dr Hubert Gaucher
Rédacteur en chef

Référence

1. Spears FM. Perspectives. J Esthet Restor Dent 2009;21(2):71–74.

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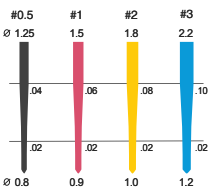

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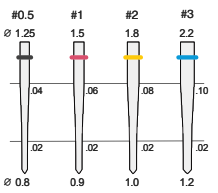

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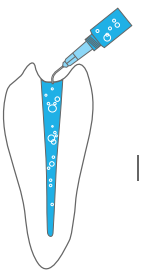
1. 
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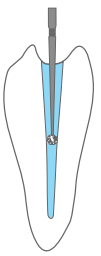
2. 
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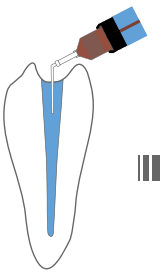
3. 
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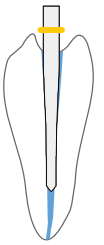
4. 
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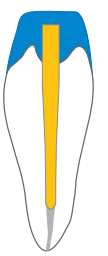
5. 
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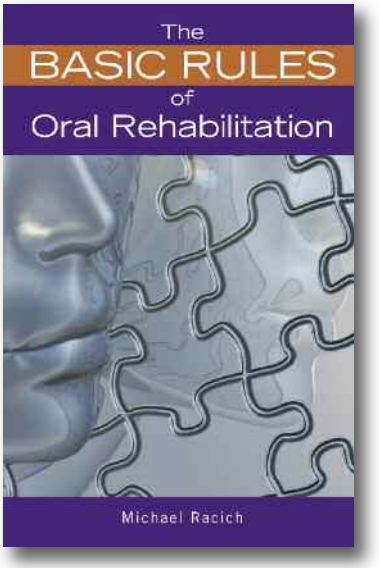

The Basic Rules of Oral Rehabilitation

By Michael Racich

The following is the foreword to *The Basic Rules of Oral Rehabilitation.*
The solution to complex puzzles is often quite simple. When something that has perplexed us for a long time is finally solved it can be very gratifying to put our minds at rest. Sometimes it can be exasperating too as we might wonder why we did not think of the simple solution first. This applies not only to all walks of life but also dentistry. When it comes to dentistry and performing any restorative or prosthodontic task we are often confronted with this conundrum. Such questions as: "Is it really this difficult?" or "Is there an easier way?" immediately come to mind. The simplification of the art and science of oral rehabilitation is what I wish to share with you over the course of the following sequence of 33 essays.

Like most of my colleagues I attend numerous programs and congresses throughout the year. As I attend these meetings a common thread appears to run through them as I tend to hear the same messages over and over. Instinctively, I want to distill down what was really important from these messages for our profession and what is on the periphery so to speak. I have spent a considerable amount of time reflecting on and reviewing what is essential for an oral rehabilitation and what our profession has recommended over the last five decades and it appears to me that there are some basic fundamentals that optimize success; basic rules if you like. Yes, being a meticulous single tooth dentist and paying attention to all the details for an oral rehabilitation is important but it is essential to know the basic rules and what the end points are. This book is a tribute to this concept.

Initially, this book was meant to be a reference for those that I have had the privilege to teach; a series of short essays condensing the messages that I espouse. However, upon further discussion with many collegues I decided to formalize my thoughts in the form of a book, especially since I am comfortable with the concept of evidence-based dentistry and realize that a book is just an opinion. As such, I plan to be as transparent in my writing as possible. This book is written as an overview of the complex topic of oral rehabilitation. It is also written to be a concise, entertaining book that could be easily read on an overseas flight or poolside. In no way has this book been assembled as a definative textbook or to minimize the heroic efforts of the countless published academics and master clinicians that have made dentistry the wonderful profession that it is today. We all owe an immense amount of gratitude to these individuals. My intention, therefore, is to be synergistic and complimentary to the works of others. Evidence-based dentistry affords the practitioner the tools to rate the information that is presented to them and blend this information with patient values and professional beliefs and experiences; this is the key thought behind the motivation for this book.

The Basic Rules of Oral Rehabilitation will create and simplify for the reader a practical approach for the diagnostic, treatment, and maintenance phases of patient care by providing 33 Basic Rules which are memorable, sequential, and gratifying. Appropriate references are included with each Basic Rule for further study by the reader. The Basic Rules are divided into 4 major sections: The Patient, The Plan, The Process, The Payoff. Each major section of the Basic Rules sequentially leads the reader threw the steps necessary for an oral rehabilitation. Although the reader can bi-pass sections and Basic Rules as they so choose it is recommended to begin with Basic Rule 1 and follow threw to #33.

I hope you enjoy this informative read as much as I have enjoyed putting my thoughts into words. A second Basic Rules book *(The Basic Rules of Occlusion)* I am currently writing and should have it ready to share with you by years-end. I enjoy the art, science, and practice of dentistry and I particularly enjoy sharing it with my colleagues.

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In Memoriam: Mr. Henri Rotsaert

By Dr. Emo Rajczak

Henri Rotsaert

As many of you know, unfortunately Mr. Henri Rotsaert passed away on February 6, 2010. His death represents a great loss to Hamilton and indeed the Canadian dental community.

In 2003, it was my pleasure to present Henri Rotsaert with an Honourary Membership in the Canadian Academy of Restorative Dentistry and Prosthodontics.

I had known Henri Rotsaert, for some time and on that 2003 occasion; Henri and I ruminated over the length of our relationship and decided that it must have been back in 1957 when he came to work for Dr. Don Coburn and me as a dental technician. Today, they are called dental technologists which I believe is a term that strongly implies a much greater knowledge and expertise than the old term does. Henri definitely personified that greater knowledge and expertise.

Henri began his training in the dental field in 1945 and worked for his dentist cousin and subsequently in a commercial laboratory in Belgium. He arrived in Canada in 1952, started work at Stelco and then moved on to work for a local real estate firm where he may have developed a strong business acumen because he certainly didn't learn that from Don and me.

He trained for his RDT, which he received in 1964, and launched his own laboratory. Needless to say his laboratory grew and his reputation grew along with it. It is now recognized as one of the largest, quality driven dental laboratories in Canada.

Henri retired in or around 1996, but, as I understand it, he still prowled about the laboratory, doing his best to create the impression that he was doing something essential and important and he probably was. But more importantly, he had trained four of his children to carry on in his laboratory, as well as a having another son in denturism. He imparted to them the same zeal and great sense of values that he had exhibited throughout his lifetime.

He was a mover and a shaker and he made a great difference in the field of dental technology and in the Canadian dental community. His efforts have been recognized by various prestigious organizations, among them, The Commercial Dental Laboratory Conference for whom he served as president from 1985–1986. In 1988, he was elected an honourary member of the Association of Registered Dental Technicians; an important honour because it was bestowed by his peers. The Hamilton Academy of Dentistry presented to him its academy shield in recognition of the help and support that Henri selflessly gave to Hamilton area dentists. In 1989, the Ontario Dental Association presented Henri with a citation in recognition of his contribution to the betterment of the goals and ideals of the profession of dentistry in the province of Ontario. Attesting to his international status in the Industry, he was elected as an honourary member (Membre d'Honneur) of Le Cercle Belge d'Esthetique Dentaire in 1991. That is the Belgian Circle of Dental Esthetics. In 1996, The American Prosthodontic Society recognized Henri for his significant contribution to prosthetic dentistry and in1998, the Association of

Registered Dental Technologists honoured him once again with its Award of Merit. I am sure that there are other awards and society memberships that I have inadvertently omitted.

In addition, Henri was not only a staunch supporter of CARDP he was a contributor educationally as well, having presented teaching clinics to our group on a number of occasions.

Despite his success and the recognition he received during his lifetime, Henri was a soft spoken, modest, self-effacing person. He was a person that will always be remembered with love and appreciation. I submit to you that Henri will be missed not only locally but also provincially, nationally, and internationally.

In recognition of Henri's contribution to Canadian dentistry and his support of Hamilton dentistry and the Hamilton Academy of Dentistry, Henri was posthumously awarded the Hamilton Academy of Dentistry President's Award on April 22, 2010. Just one more recognition of a life in dentistry extremely well spent on behalf of others and as a selfless contributor to the profession of dentistry.

Dr. Emmanuel J. Rajczak
Honourary Member
Canadian Academy of Restorative Dentistry and Prosthodontics

2010 Journal Issue Announcement

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Dr Hubert Gaucher: hgaucher@sympatico.ca
Due Date for Submissions: November 1st, 2010 / Soumissions 1 novembre 2010

2011 Journal Issue Announcement

Annonces des parutions du journal 2011

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The Custom Impression Coping
Le « Custom Impression Coping »

Dr. Allan Coopersmith, BSc, DDS, FAGD, FADI, FCARDP

ABSTRACT

The Custom Impression Coping (CIC) device comprising a hard durometer polyvinyl siloxane is used to obtain a fast and accurate and predictable impression of a single or multiple abutments without requiring a separate step for retraction, such as cords, pastes, or other devices. A method of use is discussed.

Indications: The CIC technique is indicated to obtain an impression for any indirect restoration consisting of single or a multiple crowns and bridges and more specifically when the abutment margins are below or at the gingival margin.

Characteristics of the CIC Compression Impression: The author attributes the following advantages to the CIC impression technique:

- It achieves simultaneous retraction and impression,
- It provides more accuracy – less distortion,
- The downward pressure of over-impression seats the CIC with no distortion due to movement by the operator or patient,
- It can reline just the margin or other defects as many times as necessary,
- It can reline the margin or other defects without re-taking or compromising the rest of the impression, and
- It provides increased patient and dentist comfort.

Mechanism of Action: The CIC is fabricated using a hard durometer PVS material in a manner similar to fabricating a temporary (acrylic or bis-GMA) from a preliminary impression which has been lubricated. The set CIC is removed from the lubricated preliminary impression and is trimmed with a scalpel occlusally and interproximally in order to reduce impingement and distortion, (when the CIC is placed back over the

About the Author

Dr. Allan Coopersmith graduated Suma Cum Laude from McGill University, in the Faculty of Science. He went on to graduate first in his class at the McGill School of Dentistry with Great Distinction in 1975 to earn his doctor of dental surgery degree graduating first in his class over four years with the Thornton gold medal. His post-graduate training as a general practice resident at the Albert Einstein Medical Centre permitted him to attain his American National Board Certification and Northeast Regional Board Certification with a Massachusetts Dental License which is still active today. Dr. Coopersmith is a member and fellow of CARDP and currently practices general and cosmetic dentistry in Westmount, Quebec, Canada.
He can be reached at: cooperdoc@yahoo.com

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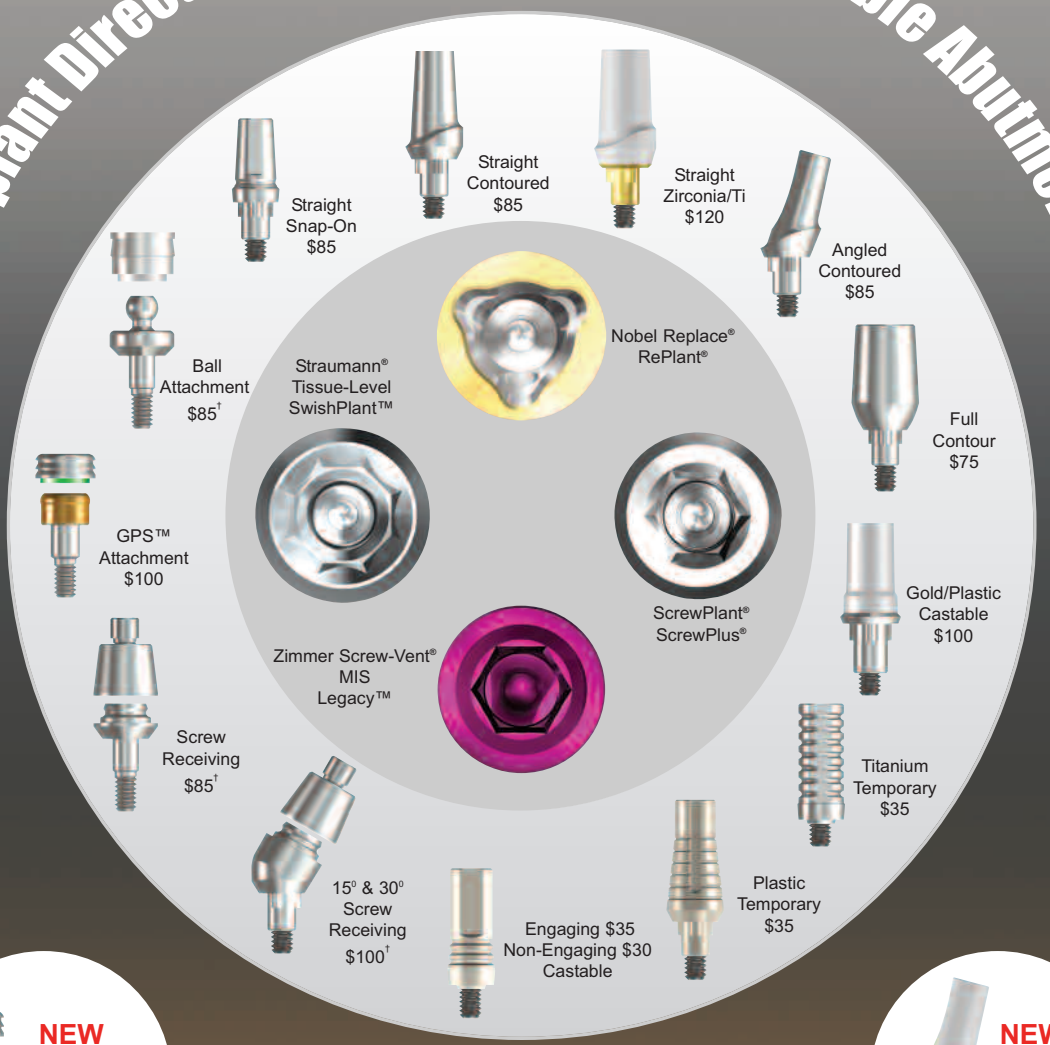

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abutment[s]). A small vent hole is placed on the occlusal aspect of the CIC and the exterior aspect of the gingival margin is coated with a light-bodied flowable material and then pressed down over the prepared tooth abutment(s). An over-impression (triple tray or stock or custom tray) picks up the relined CIC.

Benefits: The author attributes the following benefits to the CIC impression technique: (1) accuracy; (2) ease of placement; (3) fast learning curve; and (4.) economic.

RÉSUMÉ

Le dispositif « Custom Impression Coping » (CIC) comprenant la mesure au duromètre de la dureté du siloxane polyvinyle est utilisé pour obtenir une empreinte rapide, durable et prévisible de pilier unique ou de piliers multiples sans nécessiter de mesure séparée de rétraction, comme les cordes, pâtes et autres dispositifs. Un mode d'emploi fait l'objet d'une discussion.

Indications : La technique du CIC est recommandée pour obtenir une empreinte technique pour toute restauration consistant en une couronne et un pont unique ou des couronnes et des ponts multiples, et plus particulièrement lorsque les rebords des piliers sont sous le niveau ou au même niveau que le rebord gingival.

Caractéristiques l'empreinte par compression CIC : L'auteur attribue les avantages suivants à la technique d'empreinte CIC :

- Elle permet une rétraction et une empreinte simultanées;
- Elle offre plus de précision – moins de distorsion;
- La pression décroissante de la surempreinte ne cause aucune distorsion du CIC en raison du mouvement du praticien ou du client;
- Elle permet de recontourer précisément le rebord ou de corriger d'autres défauts aussi souvent que nécessaire;
- Elle permet de recontourer le rebord ou de corriger d'autres défauts sans reprendre ou compromettre le reste de l'empreinte;
- Elle permet au patient et au dentiste d'être plus à l'aise.

Mécanisme d'action : Le CIC est fabriqué au moyen d'un duromètre de dureté de matériau PVS de la même manière dont on fabrique une prothèse temporaire (acrylique ou bis-GMA) à partir d'une empreinte préliminaire qui a été lubrifiée. L'ensemble CIC est retiré de l'empreinte préliminaire lubrifiée et est rogné au scalpel sur les faces occlusales et interproximales afin de réduire l'érosion et la distorsion (lorsque le CIC est replacé sur le ou les piliers). Un petit trou de ventilation est situé sur la face occlusale du CIC et la face extérieure du rebord gingival est enduite d'un matériau très fluide puis pressée sur la ou les dents d'ancrage. Une surempreinte (porte-empreinte triple ou porte-empreinte de série ou sur mesure) reçoit le CIC recontouré.

Avantages : L'auteur attribue les avantages suivants à la technique d'empreinte CIC :
1) précision; 2) facilité de mise en place; 3) rythme d'apprentissage rapide; 4.) économie.

The Custom Impression Coping (CIC) device comprising a hard durometer polyvinyl siloxane is used to obtain a fast, accurate, and predictable impression of single or multiple abutments without requiring a separate step for retraction, such as cords, pastes, or other devices. A method of use is discussed.

The CIC technique is indicated to obtain an impression for any indirect restoration consisting of single or multiple crowns and bridges, and more specifically when the abutment margins are below or at the gingival margin.

Characteristics of the CIC Compression Impression

The author attributes the following advantages to the CIC impression technique:

- It achieves simultaneous retraction and impression,
- It provides more accuracy – less distortion,
- The downward pressure of over-impression seats the CIC with no distortion due to movement by the operator or patient,
- It can reline only the margin or other defects as many times as necessary,

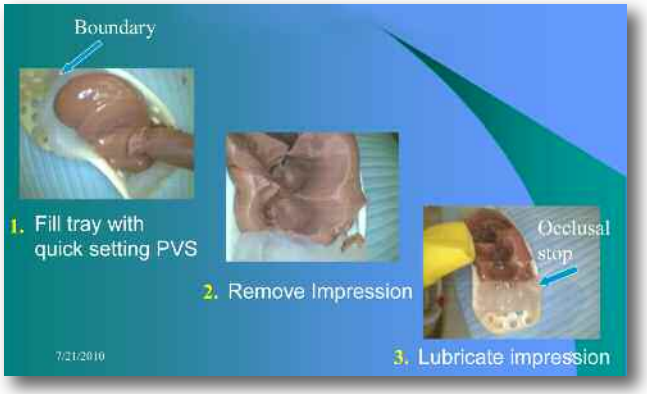

Figure 1. Preliminary impression of unprepared teeth.

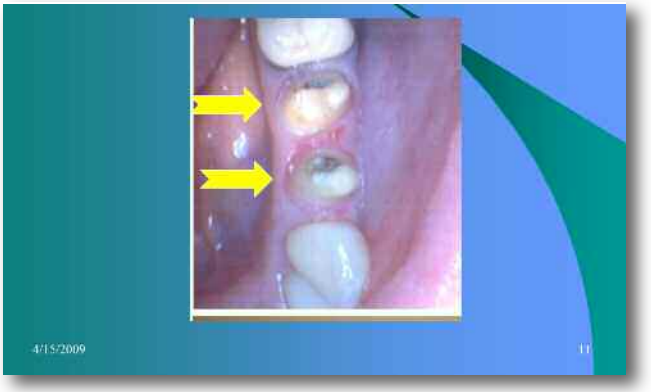

Figure 2. Prepare teeth 34 and 35 for ceramic full crowns.

- It can reline the margin or other defects without re-taking or compromising the rest of the impression, and
- It increases patient and dentist comfort.

The CIC technique addresses the shortcomings of inaccurate and tight fitting castings of other impression techniques which do not require retraction such as the Hoos H&H impression and the Dragan Gum Tissue Retraction Device and Method, etc.[1–4] These impressions require the complete relining of the preliminary impression resulting in smaller dies and tighter castings which will not seat completely. The CIC is relined with a minimal amount of light bodied impression material on the external aspect of only the gingival margin, and a vent hole is placed on the occlusal aspect of each abutment to allow the voiding of any light body which may enter the abutment cavity of the CIC. Contrary to the other non-retraction impression techniques, the CIC is trimmed occlusally and interproximally to allow for easy and unhindered placement back onto the abutment(s) which decreases distortion.[2,5,6] Distortion due to movement during set is also greatly reduced.

The Custom Impression Coping Technique

The CIC is formed using a lubricated preliminary impression to compress heavy-bodied CIC silicone material into the sulcus much in the same way a temporary impression is made. The CIC silicone is compressed and allowed to set – capturing an impression of the abutment(s) and simultaneously retracting the gingival sulcus. The techniques are illustrated in Figures 1–3.

The CIC is removed from the lubricated preliminary impression and is trimmed occlusally and interproximally with a scalpel or bur, and a hole is placed on the occlusal aspect of each abutment (Figures 4 and 5). (A dimple may be notched into the labial and lingual surface to facilitate holding the CIC with a towel clip etc.)

The CIC is relined with light body CIC on the external aspect of the gingival margin only (Figure 6).

The CIC, cleaned with an alcohol wipe, is placed back onto the abutment(s) and an over-impression with a standard tray or triple tray is used to pick up the CIC thereby producing the most accurate impression (Figure 7).

The pick-up impression is retrieved and the margins are evaluated (Figure 8) and the marginal fit of the final restorations are checked (Figure 9).

Benefits

Four benefits to the CIC impression technique are outlined below.

Accuracy

The CIC impression consistently and predictably provides a most accurate impression. Excellent margin detail is obtained without a separate step for retraction, as hydraulic pressure forces light-bodied impression material deep into and then out of the sulcus expressing blood, debris, and saliva etc (Figure 10).

Ease of Placement

The CIC is easily and quickly carried and placed over the tooth abutment(s) even in the

Figure 3. Fabricate custom impression coping.

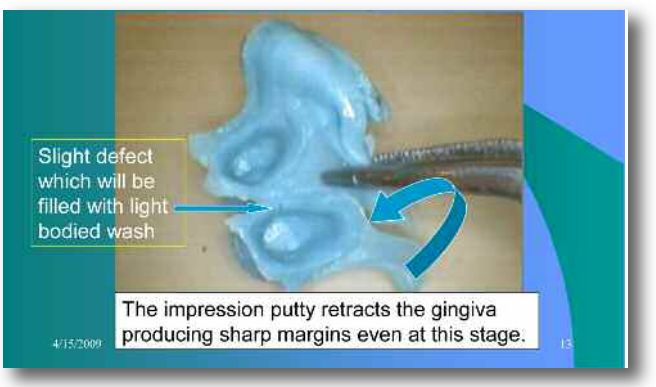

Figure 4. Remove CIC from lubricated impression.

Figure 5. Trim excess from CIC.

Figure 6. Reline external aspect of margin only, with flowable light body.

most posterior areas of the mouths of the most difficult patients. Excessive salivation, large curious tongues, and limited access are no longer a problem. This procedure is atraumatic. There is no need for retraction, no time-consuming and difficult placements nor removal of retraction cords or pastes which may cause bleeding, contamination, or recession. The CIC impression significantly increases both patient and dentist comfort (Figure 10 and 11).

Fast Learning Curve

Dentists are already familiar with the fabrication of a temporary or provisional from a preliminary impression. The CIC is fabricated in the exactly same way from a lubricated preliminary impression except PVS is used instead of acrylic or bis-GMA.

Economic

A significant time savings is achieved because the separate retraction step is eliminated. There is practically no waste. The preliminary impression can be used to make the CIC and also be used as a custom tray when the interproximals are removed with a scalpel blade. Furthermore, only a minimal amount of light-bodied impression is used to reline the external aspect of the CIC margin and over-impression. Because movement during set and distortion is reduced, and excellent margin detail is predictably obtained even in the most subgingival inaccessible areas, redos are virtually eliminated.

Mechanism of Action

The CIC is fabricated using a hard durometer PVS material in a manner similar to fabricating a temporary (acrylic or bis-GMA) from a preliminary impression which has been lubricated. The set CIC is removed from the lubricated preliminary impression and is trimmed with a scalpel occlusally and interproximally in order to reduce impingement and distortion, (when the CIC is placed back over the abutment[s]). A small vent hole is placed on the occlusal aspect of the CIC and the exterior aspect of the gingival margin is coated with a light-bodied flowable material and then pressed down over the prepared tooth abutment(s). An over-impression (triple tray or stock or custom tray) picks up the relined CIC (Figures 12–14).

Discussion

According to G.J.Christensen,[7] "the most significant reasons for poor or inadequate impressions made from elastomeric impression materials are due to the lack of visibility of subgingival margins and not due to the physical properties of the impression materials." Both conventional impression techniques as well as digital scanners which are gaining in popularity require total

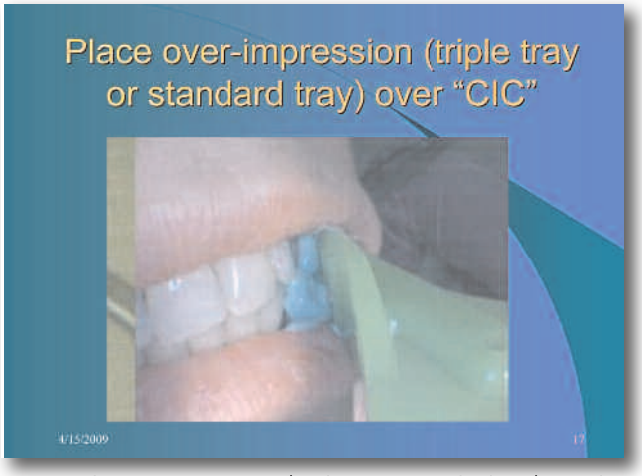

Figure 7. Place over-impression (triple tray or standard tray) over the CIC.

Figure 8. Final impression.

Figure 9. Final all-ceramic crowns immediately after cementation.

Figure 10. Time saving from start to finish. Because the light body wash is placed on the external aspect of the gingival margin of the CIC very little light-body impression material flows into the cavity of the CIC. Preferably a hole can be drilled through the occlusal aspect of every CIC before relining to vent out any excess light body wash which may inadvertently enter the CIC.

visibility of subgingival margins to ensure predictability and accuracy of fit. Christensen is puzzled why despite so many soft tissue management devices and techniques available, dentists still have difficulty properly isolating and capturing the gingival margin. Cowie states, There is no single procedure that a dentist can do or any single procedure that a lab can do for the dentist that will improve the final result of indirect restorations than improving the quality of the impression."[1,2] The impression is the basic starting point for all laboratory procedures, as well as the basis for quality and cost-effective dentistry for the clinician.

Retraction cords, especially soaked in astringents, including aluminum chloride, ferric sulphate, alum and zinc chloride, epinephrine have been shown to cause gingival irritation and inflammation and recession.[6,8,9] Technically, it is very difficult for both patient and dentist to place cords in the posterior areas of the mouth especially when working on a difficult or non-cooperative patient. Putty wash techniques have the inherent problems of delamination and distortion due to re-seating.[1,2,6]

Newer cordless techniques such as expanding poly vinyl siloxane material (Magic Foam Cord) and paste-like material (Expasyl) may induce some sensitivity and gingival inflammation.[6]

How many times does the impression look great but the casting does not fit? All impression materials poly-merize towards the rigid wall of the tray. The interproximal material has no tray so that it polymerizes toward its center.[1] Polymerization shrinkage will create distortion and will help explain how impressions taken with the same material using different techniques will produce die and fit discrepancies. CIC uses minimal wash in a vented cavity with trimmed interproximals and will not be as affected by polymerization shrinkage or re-seating distortion.

Also, it is well known that marginal deficiencies pre-dispose a tooth to plaque accumulation with resultant periodontal disease and caries.[10,11]

I therefore submit that the devices and techniques currently available are inadequate, inaccurate, time consuming and cumbersome, and can create complications for both the patient and dentist. There is a need for an accurate, simple, predictable, cost effective, and fast one-step impression device and method which simultaneously and coincidentally retracts the gingiva.

In summary, the CIC impression technique is composed of the following steps outline in Figures 14 and 15.

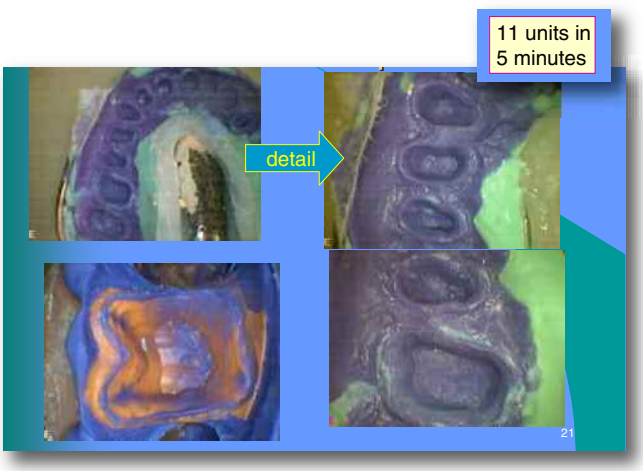

Figure 11. Additional examples.

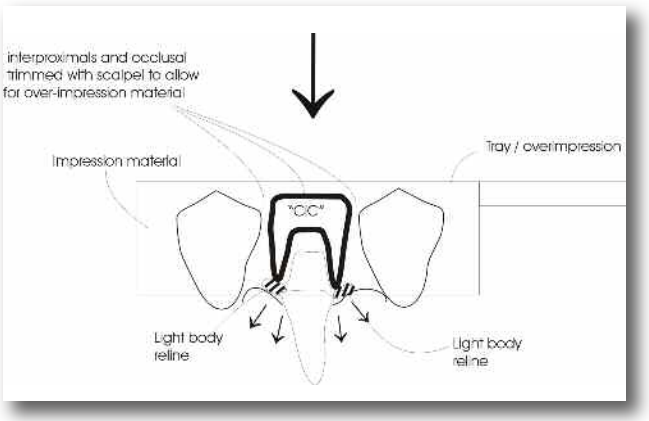

Figure 12. Impression tray placed over CIC with margins relined with unset light body material.

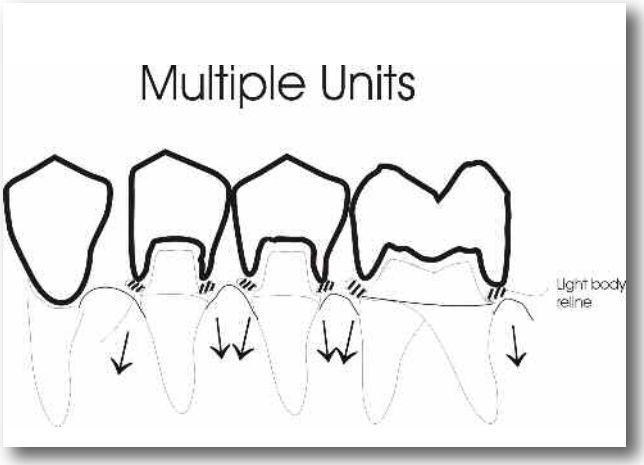

Figure 13. One piece multiple CIC units (splint or bridge) with unset relined margins placed over prepared abutments.

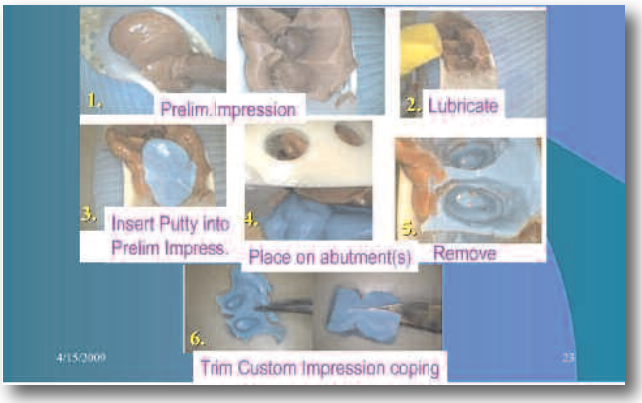

Figure 14. Summary fabrication of custom impression coping.

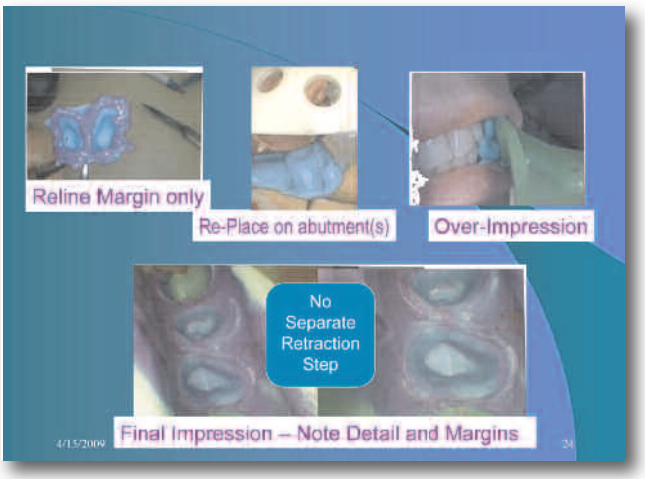

Figure 15. Summary continued.

Conclusion

The Custom Impression Coping (CIC) (patent pending) can be simply and effectively used to simultaneously retract gingival tissue away from a single or multiple abutments as well as accurately capture an impression of the prepared tooth abutments. According to the author, this technique is easy, accurate, simple, atraumatic, predictable and cost- and time-saving.

Editor's Note: Randomized clinical trials comparing the CIC impression technique to various current impressions techniques would further benefit clinicians.

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Effect of Post Geometry on the Resistance to Fracture of Endodontically Treated Teeth with Oval-Shaped Root Canals

L'effet de la géométrie de pivots radiculaires préfabriqués sur la résistance à la fracture de dents traitées par endodontie avec des canaux radiculaires de forme ovale

Dr. Begüm Akkayan, DDS, PhD, Dr. Sevda Atalay, DDS, Dr. Hubert Gaucher, DDS, MScD, Dr. Hasan Alkumru, DDS, PhD

About the Authors

Begüm Akkayan, DDS, PhD, is professor, Department of Prosthodontics, Faculty of Dentistry, Istanbul University, Istanbul, Turkey. Her fields of interest are esthetic post systems, adhesives, and all-ceramic systems. She can be reached at: bakkayan@yahoo.com.

Hubert Gaucher, BA, DDS, MScD, is the scientific director of the Canadian Dental Research Institute (CDRI/ICRD)Québec, QC. He can be reached at: hubertgaucher@cdri-icrd.ca.

Sevda Atalay, DDS, is a PhD student, Department of Prosthodontics, Faculty of Dentistry, Istanbul University, Istanbul-Turkey. She can be reached at: sevda.atalay@gmail.com.

Hasan Alkumru, DDS, PhD, is assistant professor, Department of Prosthodontics, Faculty of Dentistry, Toronto University, Toronto Canada. He can be reached at: hasan.alkumru@dentistry.utoronto.ca.

ABSTRACT

Post-root canal adaptation represents an important role in the biomechanical performance of teeth and the post-core systems. Close canal adaptation with minimal tooth structure removal provides a conservative and long-lasting treatment for the restoration of endodontically treated teeth. In some cases the root configuration could anatomically be an oval form rather than a circular shape or the resulting preparation of the canal during endodontic treatment may produce an oval form. The purpose of this study is to evaluate the effect of different fibre reinforced post systems of different geometrical cross sections, oval and circular, on the fracture resistance of endodontically treated teeth with oval-shaped root canals. 40 maxillary intact human canines were selected for this study. The crowns of each root were sectioned at the cemento-enamel junction. The roots were divided into 4 groups of 10 teeth following endodontic treatment; (1) Quartz fibre post with oval section (QFibOv); (2) Flexible resin-impregnated glass fibre stick (GFibSti); (3) Small diameter quartz fibre post with circular section and accessory cone (QFibCirAcces); (4) Glass fibre post with circular section (GFibCir). Root canal preparations were performed with the special preparation drills provided in each system. All posts were cemented with self-adhesive dual polymerizing resin cement and light-polymerized composite cores were formed. Specimens were then embedded in auto polymerizing acrylic resin melds and secured in a universal testing machine with the use of a device that allowed loading of the specimens lingually at 135 degrees to the long axis. A compressive force was applied at a crosshead speed of 1 mm/min until fracture occurred. The fracture loads (N) were determined and the data were analyzed by 1-way ANOVA with interaction followed by Tukey HSD tests. The mean failure loads (Newtons) and standard deviations (SDs) of the different post groups were calculated. The highest fracture resistance was recorded for group 3 teeth (QFibCirAcces) at 635.6 N; followed by group 1 (QFibOv); group 4 (GFibCir); and group 2 (GFibSti) at 488.4 N, 449.3 N, and 314.8 N respectively. Between-group differences in the fracture resistance of teeth were significant (p <.001) except for groups 1 and 4 (p >.05). Teeth in all 4 experimental groups displayed favourable fractures. No catastrophic failures were present and there were no root fractures. All fractures displayed favourable, repairable modes. It can be speculated that cross-sectional similarity between the root canal configuration and the geometric form of the prefabricated post system is an effective variable on the fracture resistance of endodontically treated teeth.

RÉSUMÉ

L'adaptation canalaire des pivots radiculaires joue un rôle important dans l'efficacité biomécanique des dents et des systèmes corono-radiculaires. L'adaptation canalaire précise avec suppression minimale de structure dentaire offre un traitement simple et de longue durée pour la restauration des dents traitées par endodontie. Dans certains cas, la configuration radiculaire pourrait être anatomiquement de forme ovale plutôt que circulaire, ou la préparation conséquente du canal durant le traitement endodontique pourrait produire une forme ovale. Le but de cette étude est d'évaluer l'effet de différents systèmes de pivots renforcés de fibre de différentes coupes transversales géométriques, ovales et circulaires sur la résistance à la fracture de dents traitées par endodontie avec des canaux radiculaires de forme ovale. Quarante canines maxillaires humaines intactes ont été sélectionnées aux fins de cette étude. Les couronnes de chaque racine ont été sectionnées à la jonction ciment-émail. Les racines ont été divisées en 4 groupes de 10 dents à la suite du traitement endodontique; 1) Pivot de fibre de quartz avec section ovale (QFibOv); 2) Tenon de fibre de verre imprégné de résine flexible (GFibSti); 3) Pivot de fibre de quartz de petit diamètre avec section circulaire et cône auxiliaire (QFibCirAcces); 4) Tenon de fibre de verre avec section circulaire (GFibCir). Les préparations des canaux radiculaires ont été réalisées avec les forêts de préparation spéciaux fournis dans chaque système. Tous les pivots ont été cimentés avec un ciment autocollant de résine à double polymérisation et des noyaux de moulage ont été formés. Des spécimens ont été enchâssés dans des moulages de résine acrylique auto-polymérisant et maintenus en place dans une machine d'essai universelle en utilisant un dispositif qui permettait d'installer les spécimens à 135 degrés par rapport à l'axe longitudinal de la langue. Une force de compression a été appliquée à une vitesse de traverse de 1 mm/min. jusqu'à ce que la fracture se produise. Les charges de fracture (N) ont été déterminées et les données ont été analysées en effectuant un test ANOVA unidirectionnel suivi de test de Tukey HSD. Les principales charges de rupture (Newtons) et les déviations standard (SD) des différents groupes de pivots ont été calculées. La plus forte résistance à la fracture a été enregistrée pour les dents du groupe (QFibCirAcces) à 635,6 N, suivi du groupe 1 (QFibOv), du groupe 4 (GFibCir) puis du groupe 2 (GFibSti) à 488,4 N, 449,3 N et 314,8 N respectivement. Les différences entre les groupes en matière de résistance à la fracture étaient importantes (p <.001), sauf pour les groupes 1 et 4 (p >.05). Les dents des quatre groupes expérimentaux présentaient des fractures salutaires. Toutes les fractures présentaient des modes réactifs salutaires et propices à la réparation. On peut s'attendre à ce qu'une similitude transversale entre la configuration des canaux radiculaires et la forme géométrique du système de pivots préfabriqués soit une variable efficace de la résistance à la fracture de dents traitées par endodontie.

Reconstruction of endodontically treated teeth is a great challenge since treatment alternatives vary depending on many factors such as the amount of remaining coronal dentin and the preparation[1,2]; shape and width of the root canal to access the surfaces to be bonded[3,4]; the material and type of post[5–8]; application techniques of the root canal filling material[9] and of the adhesive system[9]; the similarity between the root-canal geometry and the post used[4,10,11]; and the retention of the post and core build-up.[1,2]

Empirical evidence accumulated by experienced restorative and prosthodontic practitioners and judging from previous dental literature, a tentative clinical conclusion can be made considering the residual intact tooth structure.[12,13] According to this it appears that when more than one-half of the coronal tooth structure remains on pulpless tooth, a post-and-core procedure is not needed. However, if less than one-half of the coronal tooth structure is remaining on a pulpless tooth, it is usually advisable to place a post and core, thereby providing adequate connection of the root structure to the coronal core.

The fracture strength of the root-post-core assembly is very important to sustain the mechanical stability of the endodontically treated teeth before the definitive prosthetic restoration can be accomplished.[14] Post-root canal adaptation represents an important role in the biomechanical performance of teeth and the post-core system.[15] It is a proven concept that close canal adaptation with minimal tooth structure removal provides a conservative and long-lasting treatment for the restoration of endodontically treated teeth.[16] In some cases the root canals could anatomically be oval shaped rather than circular or the preparation of the canal during endodontic treatment may result in an oval form.[17]

Kersten et al[18] reported that shape of the root canal plays an important role in the successful treatment, apart from the efficiency of different root canal filling techniques especially in oval-shaped canals. An oval-shaped canal might be difficult to clean and shape and also results in difficulty in filling the root canal space.[19,20]

Recently, alternative post space preparation techniques in accordance with the oval-shaped canal configuration have been developed. The ultrasonic tip (Ellipson Tip; Satelec, Acteon Group, Merignac, France) of this system having an oval section is used for post space preparation in oval shaped canals and the roots are then restored with the specially designed, oval shaped quartz fibre reinforced post of the same system.[21] Fibre reinforced esthetic post systems such as the use of flexible, resin-impregnated glass fibre sticks,[22] the use of several small posts vs. standardized single post[23] and the use of accessory posts around the main fibre post[24] are among the other newest options for oval-shaped canals. However the assessment of the impact on the treatment outcome of these new systems has not been clearly defined yet.

Few studies have demonstrated the efficacy of the fracture strength of different prefabricated post systems in oval-shaped root canals and determined their respective failure modes. Assessing the impact of using oval sectioned posts instead of the circular sectioned posts in the oval-shaped canals on the treatment outcome has been evaluated in this study.

Material and Methods

Freshly extracted maxillary canines free of cracks, caries, fractures and restorations were used for this study. Mesio-distal and bucco-lingual radiographs of each tooth were taken. The ratio between the long and short canal diameter at 5 mm from the apex was calculated; if it resulted ≥2; the canal was assumed to be oval. Forty teeth with oval-shaped canal were selected.[20] All external debris was removed with an ultrasonic scaler and the teeth were stored in saline solution when not under testing. The anatomical crowns of all teeth were removed perpendicular to the long axis of the tooth, at the cemento-enamel junction (CEJ), with the use of a water-cooled diamond bur (R837.014; Diaswiss, Geneva, Switzerland) with an air-turbine at 300,000 rpm. The specimens were then endodontically treated with a step-back procedure with a size #45 file (Dentsply Maillefer, Ballaigues, Switzerland). After intermittent rinsing with 2.5% sodium hypochlorite, root canals were dried with paper points (Dentsply Maillefer, Ballaigues, Switzerland) and obturated with lateral condensation of gutta-percha (Dentsply Maillefer, Ballaigues, Switzerland) and eugenol-free sealer (AH 26; Dentsply DeTrey,

Table 1. Materials selected for this study

Material	Manufacturer	Type	Composition
Ellipson Post	Recherches Techniques Dentaires, St. Egreve, France	Translucent quartz fibre post with oval section	Quartz stretched fibre, epoxy resin
Everstick Post	Stick-Tech, Turku, Finland	Flexible, resin-impregnated glass fibre sticks	PMMA and bis-GMA impregnated, silanated glass fibre
D.T Light Post	Bisco Inc., Schaumburg, IL, USA	Translucent quartz fibre post with circular section	Quartz fibres 62%, epoxy resin 38%
Fibrecone	Recherches Techniques Dentaires, St. Egreve, France	Translucent quartz fibre accessory cone	Quartz stretched fibre, epoxy resin
RelyX Fibrepost	3M ESPE Seefeld, Germany	Translucent glass fibre post	Glass fibres 70–80%, Resin matrix 20–30%
RelyX Unicem	3M ESPE Seefeld, Germany	Self-adhesive dual polymerizing resin luting agent	Silanated glass powder, silane treated silica, calcium hydroxide, sodium persulfate, pyrimidine
Clearfil S3 Bond	Kuraray Co Ltd, Osaka, Japan	Light polymerizing all-in-one adhesive system	MDP, Bis-GMA, HEMA, Hydrophobic dimethacrylate, dl-camphorquinone, ethyl alcohol, water, silanated colloidal silica
Clearfil Photo Core	Kuraray Co Ltd, Osaka, Japan	Light polymerizing core material	TEG-DMA, bis-GMA, dl-camphorquinone, silanated glass and barium glass powder

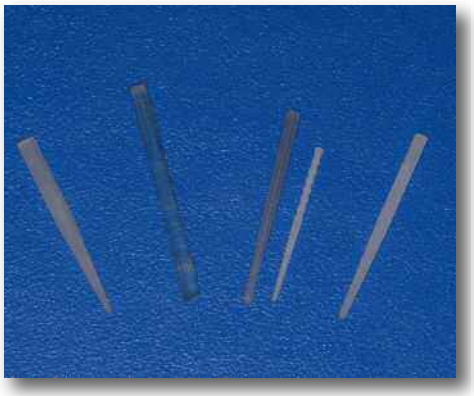

Figure 1. Post systems (left to right) Ellipson Post, Everstick Post, D.T. Light Post and Fibrecone, and RelyX Fibrepost.

Figure 2. Specimens were loaded lingually at 135 degrees to the long axis with a compressive force.

Konstanz, Germany). Teeth were then assigned to 4 experimental groups of 10 teeth each. The materials used in this study are presented in Table 1.

Each post was marked at a distance of 12 mm from its apical end and post surface areas were calculated at this length as accurately as possible. The sizes of the post systems in this study having the most similar surface area available among the post systems were chosen. A line was drawn around each post at this level and then all posts were sectioned horizontally with a water-cooled diamond fissure bur. This standardized the post lengths and established similarity between post diameters and surface areas of the tapered designs. Gutta-percha was removed from the root canals with Peeso drills to a depth of 8 mm and post spaces were prepared with the special preparation drills of each system.

Quartz fibre posts (QFibOv) with an oval section (Ellipson Post, Recherches Techniques Dentaires, St. Egreve, France) were used in group 1. Oval posts are manufactured only in one size and the special tip of the system (Ellipson Tip; Satelec, Acteon Group, Merignac, France) was used to prepare the post spaces for these posts. Flexible resin-impregnated glass fibre sticks (size 1.5) were adjusted and placed in the second group (GFibSti) (Everstick Post, Stick-Tech, Turku, Finland). For the third group (QFibCirAcces) quartz fibre posts with circular section, (DT Light-Post, Recherches Techniques Dentaires, St. Egreve, France) were used in combination with an accessory cone (Fibrecone, Recherches Techniques Dentaires, St. Egreve, France). A post size of #0.5 was selected for D.T. Light-posts. Glass fibre posts with circular section were used (RelyX Post, 3M ESPE, Seefeld, Germany) in group 4 (GFibCir). The selected post size was #1 (Figure 1).

All posts were cemented with self-adhesive dual polymerizing resin cement (RelyX Unicem, 3M ESPE, Seefeld, Germany) according to the manufacturer's instructions. The cementation procedure started with clicking the flexible root canal shaped application aid (Elongation tip, 3M ESPE, Seefeld, Germany) on the special aplicap of the system (Unicem Aplicap, 3M ESPE, Seefeld, Germany). After activating the aplicap for 2–4 seconds the resin cement was machine mixed for 15 seconds with the capmix machine (Rotomix, 3M ESPE, Seefeld, Germany). Then the application aid was inserted down to the bottom of the root canal and the self-adhesive resin cement was applied by slowly pulling the application aid out of the canal. The posts were seated into the root canal and excess cement was removed. The post was light polymerized for 40 seconds with the tip of the light curing unit (Optilux 501, Kerr, Danbury, CT, USA) directly in contact with the coronal end of each post.

Core was prepared with the use of the adhesive system (Clearfil S3 Bond, Kuraray, Osaka, Japan). A light-polymerized composite core (Clearfil Photo Core, Kuraray, Osaka, Japan) was fabricated on one of the specimens, and a crown preparation was completed on the composite material with the use of water cooled diamond coated burs. The core portion of the post and core restoration was 6.0 mm in height. A matrix was formed on the core with 0.6 mm foil (Adapta System, Bego, Bremen, Germany). The matrix was filled with the composite material, seated on the root of another specimen along the long axis, and light polymerized for 40 seconds from facial and lingual surfaces with a light curing unit. All other composite cores were produced as described above.

All specimens were stabilized on a surveyor (Paraflex, Bego, Bremen, Germany) with vertically moving rods, from the most coronal tip of each specimen, with sticky wax. Root surfaces were marked 2 mm below the CEJ and covered with 2 0.1 Adapta foils (Adapta System, Bego, Bremen, Germany). Specimens were then embedded in auto polymerizing acrylic resin (Meliodent, Bayer Dental, Newbury, UK) surrounded by aluminum cylinders. After the first signs of polymerization, the teeth were extracted from acrylic resin blocks by moving rods in an upward direction, and adapta spacers were removed from the root surfaces. Silicon-base impression material (Rhodorsil, Rhone-Poulenc, Lyon, France) was injected into acrylic resin molds and the teeth were reinserted into resin cylinders. Thus, standardized silicone layers simulating the periodontal ligament were created.

Specimens were secured in a universal testing machine (Shimadzu, Tokyo, Japan) with the use of a device that allowed loading of the specimens lingually at 135 degrees to the long axis (Figure 2). The load head was placed on the specially formed palatal step. A compressive force was applied at a crosshead speed of 1 mm/min until fracture occurred. The fracture loads (N) were determined and the obtained data were analyzed by 1-way ANOVA with interaction followed by Tukey HSD tests. Failures were classified as favourable or catastrophic fractures. The favourable fractures were further categorized as failures of core materials covering the post $> 1/3$ or $< 1/3$, and loss of core retention at the dentin interface with the post being in place.

Table 2. Experimental post groups with esthetic post systems

GROUP NUMBER	POST MATERIAL	GROUP NAME	POST TYPES
Group 1 (n = 10)	Ellipson Post	QFibOv	Quartz fibre post with oval section
Group 2 (n = 10)	Everstick Post	GFibSti	Flexible resin-impregnated glass fibre stick
Group 3 (n = 10)	D.T Light Post and Fibrecone	QFibCirAcces	Small diameter quartz fibre post with circular section and quartz fibre accessory cone
Group 4 (n = 10)	RelyX Fibrepost	GFibCir	Glass fibre post with circular section

Table 3. The mean (SD ± Standard deviations) fracture strength values (in Newtons) of the experimental groups

Groups	Mean	SD
Group1 QFibOv	488.4^{B}	28.36
Group 2 GFibSti	314.8^{C}	32.89
Group 3 QFibCirAcces	635.6^{A}	43.80
Group 4 GFibCir	449.3^{B}	20.34

Same letters show no significant difference ($p < .05$)

Results

The mean failure loads (Newtons) and standard deviations (SDs) of the different post groups were calculated for all the experimental groups (Table 2).The highest fracture resistance was recorded for group 3 teeth (QFibCirAcces) at 635.6 N; followed by group 1 (QFibOv); group 4 (GFibCir); and group 2 (GFibSti) at 488.4N, 449.3 N, and 314.8 N, respectively (Figure 3). Between-group differences in the fracture resistance of teeth were significant ($p < .001$) except for groups 1 and 4 ($p > .05$) (Table 3).

Failures in all post groups were classified as favourable and repairable. No catastrophic failures were present and there were no root fractures. Categorization and incidence of failure types are displayed in Table 4.

Discussion

Heydecke et al.[25] reported that the choice of an appropriate restoration for endodontically treated teeth is guided by strength and esthetics. Asmussen et al.[26] suggested that mechanical properties of post systems should be considered when investigating the causes of failure in endodontically treated crowned teeth. It has been defined that the ability of an object to resist dimensional change under a given stress is related to its stiffness or elastic modulus and it is a good predictor of the type of materials used.[27,28] The restoration of endodontically treated teeth with post materials having elastic modulus similar to those of dentin has proven to reduce the risk of root fractures.[5,29,30]

Former fracture strength studies showed that tooth fractures were favourable when they were restored with fibre posts, creating less damage to the root and being repairable due to their similar modulus of elasticity to dentin.[5,8,31,32] Fibre reinforced post systems were used in all the four experimental groups of the present study for the same reason and the results of the present study supports the findings of these previous studies[5,29,30] where no catastrophic root fractures were seen in teeth restored with quartz fibre posts.

Apart from the post material used, the geometric similarity between the root canal shapes and the post used is a critical consideration, but this topic has received limited attention especially for oval shaped canals. The oval shaped root canals have been reported as one of the main reasons of endodontic failure as a result of preventing a correct canal instrumentation and cleanliness.[9,33,34] Wu et al.[20] reported that the use of conventional nickel-titanium instruments maintain a self-centred position while rotating, creating a circular bulge and producing a smear layer in the portions of the canal where it acts, whereas pulp remnants and infected dentin remain on the uninstrumented areas. When circular post drills and posts are used in oval shaped root canals, sound dental tissue is sacrificed to adapt the canal shape to the post,[35] thus resulting in decreased root strength.

The removal of smear layer and smear plugs is desirable before luting fibre posts to obtain a wide dentin surface area available for bonding and a high number of open dentin tubules, which could be infiltrated by the adhesive system.[36] For this reason the use of ultrasonic tips with adequate irrigants have been reported to be useful for post space debridement.[37,38] However, the conventional ultrasonic tips with their circular section might not respect the root configuration in oval-shaped canals.

It has been reported in former studies that the use of Satelec oval tip can respect the root anatomy, and it might be combined with oval fibre posts.[38] Furthermore, the reproduced oval canal configuration will not leave uninstrumented wall portions in the post space, thereby allowing for a good debridement. The use of an ultrasonic tip with an oval section in oval-shaped canals resulted with better smear layer removal from post space walls compared to the circular section drills and cylindrical post system.[39] It can be speculated that the oval posts will resist to higher fracture values in oval-shaped canals compared to circular sectioned posts. Second highest fracture strength values with

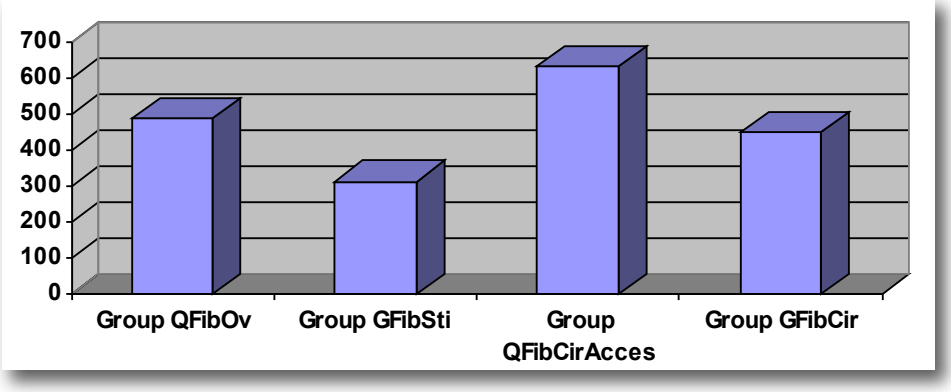

Figure 3. Mean fracture strength values and trust interval at 95% for all groups.

Table 4. Incidence (percent) of favourable and catastrophic failure types per group

Fractures	Favourable Fractures			Catastrophic Fractures
Failure Types	> 1/3 Core Fracture	< 1/3 Core Fracture	Loss of core retention	Post or Tooth Fracture
Group 1. QFibOv	40	40	20	0
Group 2. GFibSti	20	—	80	0
Group 3. QFibCirAcces	10	90	—	0
Group 4. GFibCir	30	70	—	0

488.4 N were obtained for Group1, QFibOv, quartz fibre reinforced oval posts in the present study. However, this finding was not statistically different ($p < .05$) from group 4, GFibCir, glass fibre reinforced cylindrical posts with 449.3 N. One of the possible explanations for this fact in the present study could be the insertion of a large volume of cement around the oval post to fill the empty root canal following endodontic treatment. This may cause the reduced cohesive resistance of the cement and even reducing the bond strength to dentine. The use of the Satellec Tip for both the endodontic treatment and for the post space preparation in oval shaped canals could result with higher failure loads due to the better adaptability between oval post and the canal thereby reducing the thickness of the cement and increasing root strength. Root canal spaces were larger in volume due to the endodontic treatment performed before the preparation of the post spaces compared to the one size quartz fibre reinforced oval posts of the system used in this study. On the other hand the remaining tooth structure was conserved by the use of the smallest post size in group 4, GFibCir. It has been reported in many studies that reducing the thickness of the cement layer prevented adhesive failures and increased post retention.[23,39]

Although no significant differences in the fracture strength values were observed between groups 1 and 4, the failure types presented differences. In group 1 samples, 40% core fracture covered more than of 1/3 core, 40% core fracture covered more than 1/3 of the core, and 20% loss of core retention was observed whereas in group 4 samples the ratios were 30% core fracture covered more than 1/3 of the core, 70% core fracture covered more than 1/3 of the core. Core material detachment was observed the least in group 3 followed by group 4. It can be speculated that these two post systems and core complexes provide the necessary resistance to fracture and also ensure a favourable restoration prognosis. 80 % of the group 2 samples loss of core retention was recorded. The increased thickness of the cement layer could be responsible for this result due to the reduced cohesive resistance of the cement and to the reduced bond strength to dentine.

One of the newest options for oval-shaped canals is the insertion of small accessory posts. Bonfante et al.[24] restored roots with oval canals using main glass fibre posts combined with accessory posts, and using main glass fibre post surrounded by glass fibre strips previously impregnated with composite resin. The results of their study revealed no statistically difference ($p < .05$) between these two groups. They also reported that there was a direct relationship between the proportion of fibres and resin and tooth fracture strength. The results of our study support the findings of this study as in group 3, QFibCirAcces since it provided higher fracture strength values compared to other reconstruction options investigated. In this group the volume of fibres was increased and the cement thickness was minimized. In group 2 samples, the fibres were less dense compared to other systems tested and the cement layer around the posts was thicker, causing the lowest fracture strength values among the groups tested.

It is anticipated that post-and-core use will continue to increase because of the current trend to retain natural teeth into the mature years of life. Recent studies on fibre reinforced posts revealed little or no root fracture, indicating that they reduce the risk of fractures, especially vertical or oblique catastrophic root fractures. Post space preparation in oval-shaped root canals can involve the alteration of canal shaping, thus decreasing the resistance to fracture of endodontically treated teeth. The fracture strength values and failure modes observed in this study suggest that the techniques investigated are viable for functional recovery of teeth in oval-shaped canals.

Conclusion

Within the limitation of this in vitro study the following conclusions may be drawn: (1)Significantly higher fracture resistance was observed in group 3, (QFibCirAcces) in teeth restored with the quartz fibre matrix post system supported with the quartz fibre accessory post than teeth restored with the other 3 systems tested ($p > .001$). (2) The second highest fracture strength values were recorded for group 1, (QFibOv) quartz fibre reinforced oval posts. (3) Group1, QFibOv, quartz fibre reinforced oval posts were not statistically different from group 4, GFibCir, glass fibre reinforced cylindrical posts ($p < .05$). (4) The use of flexible glass fibre stick posts resulted with the lowest fracture strength values. Using accessory posts to fill the post space and decrease the cement layer thickness may result in higher values. (5) All teeth fractured favourably and as such were fractures that were able to be repaired. (6) No root fractures were observed in any of the groups.

Disclosure

The authors declare no competing financial interest with any of the materials used in the present study.

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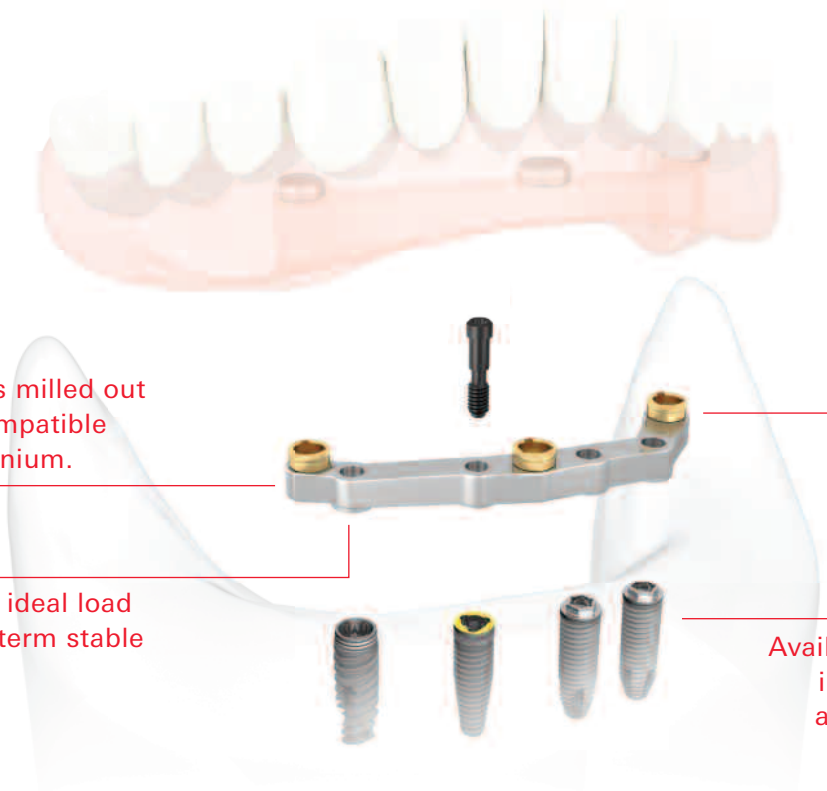

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Dental Product Commercialization: From Idea to Launch

Commercialisation de produits dentaires : De l'idée au lancement

Dr. Alfred Viehbeck, PhD

ABSTRACT

The growth and survival of companies depend strongly on the ability to successfully introduce new products that solve industry needs. This article outlines the process of innovation experienced at 3M ESPE Dental Products. It walks us through the development stages, from the birth of an idea through testing of the concept, the development of a business case, the testing for safety and effectiveness, and finally to manufacturing and launch of the new product. 3M ESPE has developed a robust new product commercialization process built upon the foundation of evidence-based results, a step it feels is imperative for all dental product manufacturing companies.

RÉSUMÉ

La croissance et la survie des entreprises dépend fortement de la capacité de lancer de nouveaux produits qui répondent aux besoins de l'industrie. Cet article décrit le processus d'innovation mis en application aux Produits dentaires 3M ESPE. Il nous fait passer les stades de développement, de la naissance d'une idée à l'essai du concept, à la réalisation d'une analyse de rentabilisation, aux essais de sécurité et d'efficacité et, finalement, à la fabrication et au lancement du nouveau produit. La société 3M ESPE a établi un solide processus de commercialisation de nouveaux produits reposant sur des résultats fondés sur des preuves, une étape qu'elle estime obligatoire pour toutes les entreprises de fabrication de produits dentaires.

About the Author

Alfred Viehbeck, PhD, is vice-president, research and development, 3M ESPE Dental Products. He can be contacted at: aviehbeck1@mmm.com

The growth and survival of companies depend strongly on the ability to successfully introduce new products that solve industry needs. Most industry leaders see innovation as the key to competitiveness and the most important function of the research and development organization.[1] The generation of new ideas and provision of proof of concept are essential to the innovation process, but there is much uncertainty around when the process of innovation starts and ends.

The beginning of the innovation process has been called the "fuzzy front end" and is poorly understood.[2,3] New ideas can come from anywhere in the organization. Often the best ideas are created through a combined effort between the laboratory and marketing. This process involves translating an idea into potential concepts and then testing their validity. Drucker provided a list of seven potential sources of innovation[4]:

1. New knowledge
2. Unmet process needs
3. Changes in the industry and market
4. Demographic changes
5. Changes in perception
6. Unexpected occurrences
7. Incongruities

The challenge for company managers is selecting the best ideas that will lead to successful commercialization. There are many ways to filter ideas and projects in an attempt to choose the right ones. A highly popular system of idea and project management is the Cooper's Stage-Gate Process.[5] This process provides the framework to essentially "risk manage" an idea or project to reduce uncertainties by addressing the critical risk issues in a linear approach. One approach is to take an idea, synthesize the concepts, and then test their feasibility by fabricating models or prototypes. The concept stage also requires thorough knowledge of the market and customers' needs. Once prototypes are created, they can be evaluated in the field to ensure that the product design and feature will be valued by the customers. Once feasibility is reached, a business case analysis is performed based on market opportunity size and manufacturing cost assumptions. Once a valid business case has been achieved, this opportunity should be compared against all the others in the overall project portfolio and other ideas to determine if it has a priority status.

In the case of new oral care product projects, once the project has successfully passed the filter of technical feasibility, viable business case, and priority, it moves into a phase where investment costs increase sharply. To meet local, state/provincial, federal, and company compliance requirements, dental companies must conduct appropriate toxicological, biocompatibility, and clinical studies. It is therefore important that projects moving beyond feasibility are those with the greatest strategic and/or business impact potential. Companies that manufacture dental products must invest to ensure that their products are safe and effective for patients, practitioners, and the environment as well as comply with all global regulatory requirements. Companies must commit to generating credible scientific data and analysis for communicating with the dental profession and the public as well.

The evidence-based scientific approach to medicine emerged at the turn of the century in response to the need to improve the quality of health and to close the gap between research and practice. The ever-increasing avalanche of new information and increasing public expectation and demand for successful clinical outcomes from dental services are driving the need for evidence-based dentistry, which is the process of conscientiously making judicious diagnostic and therapeutic decisions on the basis of known facts rather than opinion or anecdote.

The principle behind evidence-based dentistry is the concept that practitioners are not taught what to learn but how to learn, and to question the "why" in addition to the "how." The approach is based on the systematic analysis of a clinical situation to optimize the diagnosis and treatment plan rather than just following recommendations or local practices. It is essential that all dental products and recommended procedures be validated through high-quality research and high-quality clinical investigations. Quality assurance is paramount in order to ensure product consistency and not compromise the outcome or invalidate the results. Research and clinical studies must also be statistically significant and effectively represent the intended indication that will be used to support product claims and the product use instructions. The clinician conducting the study must be thoroughly educated and trained on the specific details in the application of any new technology or product.

Once the product has been determined safe and effective in its intended use, the manufacturing scale-up process begins. When a production process has been "locked in," the product produced undergoes repeated testing to ensure that a robust and reproducible product is fabricated. The laboratory and marketing team works to finalize the claim statements for publication. Concurrently, the business and marketing organization finalizes the strategy of how the product will be positioned in the marketplace and how it is to be supported with advertising and merchandising, and it creates a launch plan. In addition, sales force and customer education plans are developed.

As a manufacturer of dental products, 3M ESPE has a very "fuzzy front," with everyone permitted the freedom of "15% culture" (allowing employees to spend 15% of their time on projects of their choosing to develop ideas or technologies that may be outside of their regular work focus). But it also has developed a robust new product commercialization process built upon the foundation of evidence-based results. This process is highly disciplined and structured to ensure that all ethics, industry, government, and company compliance policies are met. Any new material or formulation change is first tested for toxicity according to international guidelines. Once the product has been determined safe for use in humans, randomized clinical studies are commissioned at multiple independent reputable institutions. Specific "instructions for use" are then written based on the results of the studies. Round-table discussion sessions with clinicians around the world are then conducted to discuss the results of their clinical case experiences. 3M ESPE encourages the publication of laboratory and clinical studies in peer-reviewed scientific

journals and presentations at national and international conferences. The company has also established its own vehicle to disseminate scientific evidence-based studies. Studies are published under the 3M ESPE Espertise Scientific Facts brand rather than under a purely product-oriented brand. The publication of product performance results helps practitioners make evidence-based dental care choices that are best suited for a given clinical circumstance. A significant portion of our company's R and D budget is allocated toward evidence-based clinical investigations, with typically more than 100 active studies under way.

It is imperative that dental product manufacturing companies continue to support evidence-based dentistry to ensure that their products are safe and fit for the intended use. The ultimate goal of new dental products is that they result in faster, easier, and better dentistry leading to a successful new product launch. 3M ESPE is committed to delivering the best products, services, and innovation through the fuzzy front end into a solid new product launch that solves an important industry and customer need.

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Mouthguards: Performance Aids or Expensive Placebos?

Protecteurs buccaux : aides efficaces ou placebos coûteux?

Dr. Preeti Satheesh Kumar, BDS, MDS, Dr. Ravindra C. Savadi, BDS, MDS, Dr. Geetha. K. Patil, BDS, MDS, Dr Satheesh Kumar, BDS, MDS

About the Authors

Preeti Satheesh Kumar, BDS, MDS, is assistant professor, Department of Prosthodontics, The Oxford Dental College & Hospital, Bangalore, India. She can be contacted at preeti@yahoo.co.uk.

Ravindra C. Savadi, BDS, MDS, is professor, Department of Prosthodontics The Oxford Dental College & Hospital, Bangalore, India.

Geetha. K. Patil, BDS, MDS, is professor,Department of Prosthodontics, Rajiv Gandhi Dental College & Hospital, Bangalore, India

Satheesh Kumar, BDS, MDS, is assistant professor, Department of Prosthodontics The Oxford Dental College & Hospital, Bangalore, India

ABSTRACT

Participation in sports carries the risk of sustaining some form of dental injury. Mouthguards are an important piece of athletic equipment for anyone participating in a sport that involves falls, body contact or flying equipment. In virtually all sporting and recreational activities, accidents happen and traumatic oral injuries are possible. The U.S. surgeon general's report on oral health identified sporting activities as one of the "principal causes of craniofacial injuries." In children, sports accidents reportedly account for 10–39% of all dental injuries. Studies have linked sporting activities to nearly one third of all dental injuries and approximately one in six sports-related injuries is to the craniofacial area.

The Role of A Mouthguard in Preventing Injury

By providing a resilient, protective surface that covers the teeth, and fits to the depth of the *vestibule*, the mouthguard distributes and dissipates transmitted forces on impact, thereby minimizing the risks of sustaining trauma to the hard or soft tissues or minimizing the severity of that trauma.

Conclusion: Safety is essential for maintaining oral health, and a properly fitted mouthguard can minimize the risks of sustaining oral injuries during participation in sports. Health professionals should familiarize themselves with this treatment modality because the simplicity and cost of the custom mouth protector makes its use applicable to a wide range of patients for the preservation of oral structures from the effects of potential trauma.

RÉSUMÉ

La pratique de sports entraîne le risque de subir une certaine forme de blessure dentaire. Les protecteurs buccaux sont une importante pièce d'équipement athlétique pour tout adepte d'un sport qui implique des chutes, des contacts corporels ou un équipement de vol. Dans la quasi-totalité des sports et des activités récréatives des accidents surviennent et des lésions buccales traumatiques sont possibles. Le rapport du chef des Services de santé des États-Unis sur la santé buccale a désigné les activités sportives comme une des « principales causes de blessures craniofaciales », Chez les enfants, on soutient que les accidents de sport sont à l'origine de 10 à 39 p. 100 des blessures dentaires. Des études ont associé les activités sportives à près d'un tiers de toutes les blessures dentaires et environ une blessure liée aux sports sur six touche la partie craniofaciale du corps.

Le rôle du protecteur buccal dans la prévention des blessures

En fournissant une matière protectrice élastique qui recouvre les dents et qui s'insère profondément dans le vestibule, le protecteur buccale répartit et dissipe la force d'impact et minimise ainsi les risques de subir un trauma des tissus durs ou mous, ou minimise la gravité de ce trauma.

Conclusion : La sécurité est essentielle pour assurer la santé buccale et un protecteur buccal correctement ajusté peut minimiser les risques de subir des blessures buccales en pratiquant des sports. Les professionnels de la santé devraient se familiariser avec ce mode de traitement parce que la simplicité et le coût d'un protecteur buccal sur mesure permettent de l'appliquer à un large éventail de patients et ainsi protéger les structures buccales des effets de traumas éventuels.

Participation in sports carries the risk of sustaining some form of dental injury. Mouthguards are an important piece of athletic equipment for anyone participating in a sport that involves falls, body contact, or flying equipment.[1] In virtually all sporting and recreational activities, accidents happen and traumatic oral injuries are possible. The U.S. surgeon general's report[2] on oral health identified sporting activities as one of the principal causes of craniofacial injuries." In children, sports accidents reportedly account for 10–39% of all dental injuries.[1] Studies have linked sporting activities to nearly one third of all dental injuries[2–4] and approximately one in six sports-related injuries is to the craniofacial area.[2]

Although dental and soft-tissue injuries typically are associated with collision and contact sports[1] (which are defined as sports in which the players physically interact with each other, trying to prevent the opposing team or person from winning), oral trauma is just as common, if not more so, in other sports. High-risk contact sports include soccer, boxing, hockey, rugby, and lacrosse. Less obviously hazardous sports are basketball and baseball and non-contact activities include bicycling, gymnastics and in-line skating.[2]

An almost universal finding is that the majority of injuries affect the maxillary jaw, with the maxillary incisors being most prone to injury ,often accounting for as many as 80% of all cases. Unlike some other injuries, a single traumatic injury to the dentition may never heal completely, and it can create a lifetime of expensive and long-term problems for the affected athlete.[2,5]

The Role of a Mouthguard in Preventing Injury

By providing a resilient, protective surface that covers the teeth, and fits to the depth of the vestibule, the mouth guard distributes and dissipates transmitted forces on impact, thereby minimizing the risks of sustaining trauma to the hard or soft tissues[6] or minimizing the severity of that trauma.[2,3] These injuries could include: chipped, luxated, or avulsed teeth; maxillary or mandibular fractures; soft tissue lacerations to the gingivae and oral mucosa, fractures of the alveolar processes, condyles, gonial angles and body of the mandible, and concussion.[2,3]

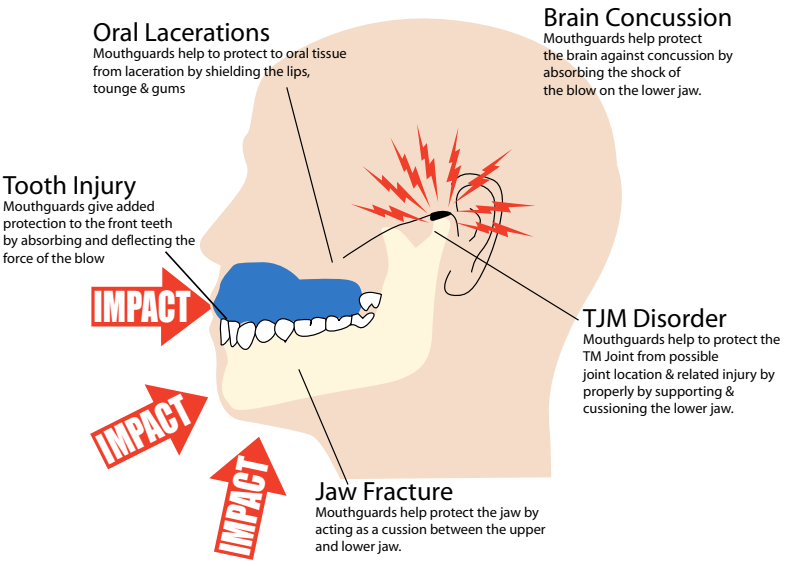

Figure 1. Role of mouthguard in preventing injury.

Thus the mouthguard works to reduce the point forces in the orofacial area by distributing these point forces over a sufficiently wide area. The result is a reduction in forces on oral tissues[7] which means that the mouthguard works by absorbing some of the energy from the direct blow at the site of the impact and dissipating the remaining energy by cushioning and redistributing force. Mouthguards therefore minimize the risk of oral lacerations by separating the cheeks and lips away from the teeth making users less susceptible to soft-tissue laceration and preventing opposing arches from traumatic contact with each other. In addition they decrease the force transmitted through the temporomandibular joints to the base of the skull by preventing superior and posterior displacement of the condyle in the fossa. Mouth protectors also protect against concussion, neck injuries, and more serious central nervous system injuries[8,9] (Figure 1).

The term mouthguard is generic and universal, and includes a range of products from over-the-counter models sold in sporting goods stores to professionally manufactured and dentist-prescribed custom-made mouthguards. It is clear that mouthguards ,just like the athletes they are designed to protect, are not the same.[5] No matter which type of mouth guard is chosen, it should be protective, resilient, tear-resistant, inexpensive, odourless, tasteless, easy to fabricate, and comfortable. It should also fit properly and not restrict speech or breathing.[5]

Common Types of Mouthguards

Stock Mouthguards

These are the least expensive option and offer the least amount of protection. They can be found in most sporting goods stores and come in limited sizes, usually small, medium, and large. Unfortunately, these protectors are bulky and lack retention and are held in place by constant bite pressure. Athletes using stock-type mouth guards usually experience gagging as well as difficulty in breathing and speaking.[1,2,5,10–15]

Mouth-Formed Boil-and-Bite Mouthguards

These are also available commercially. These mouth-formed protectors are sold in two varieties: the shell-liner mouthguard and the thermoplastic, boil-and-bite model.

The shell-liner mouthguard consists of a polyvinyl chloride outer shell that fits loosely over the dentition and includes an inner lining of plasticized acrylic gel or silicone

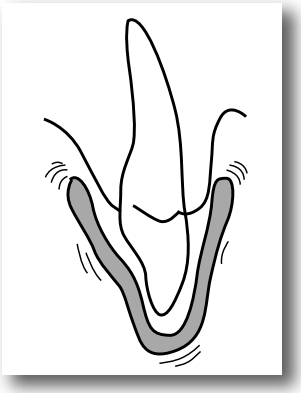

Figure 2A. Boil-and-bite mouthguard which does not fit accurately with inner lining of silicone.

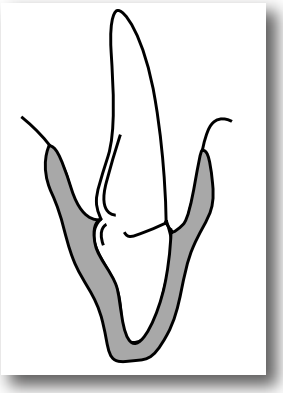

Figure 2B. A custom mouthguard which fits well.

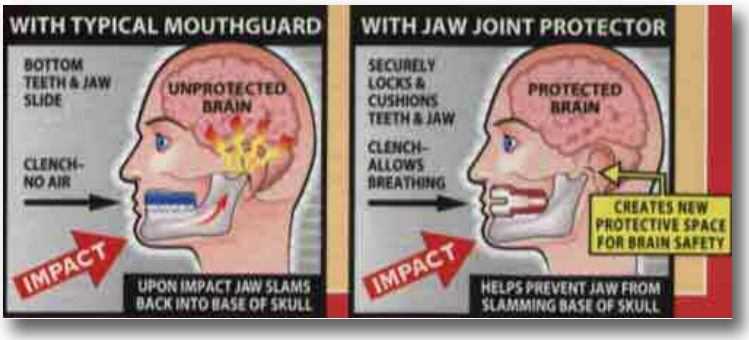

Figure 3. Jaw joint protector.

rubber (Figure 2A and 2B).

In the case of the boil-and-bite mouth guard, the thermoplastic material is immersed in hot water and formed in the mouth by using finger, tongue, and biting pressure. Available in limited sizes, these mouthguards often lack proper extensions, do not cover all the posterior teeth, have poor fit, poor retention, and may cause gagging effects in a majority of athletes. Athletes often cut and alter these bulky and ill fitting boil-and-bite mouth guards to increase retention, which in turn further reduces the protective properties of these mouthguards.[1,2,5,12–16]

Another variation of the boil-and-bite mouth guard is called the "jaw-joint protector," a bimaxillary device that positions the mandible forward in an effort to protect the associated basal skull surface from concussion[2] (Figure 3).

Custom-Made Mouthguard

Such mouthguards are made from a mould of the patients mouth. They are of two types, those made on vacuum machines and those made by pressure machines.[15–17] The most common material for this use is a polyethylene vinyl acetate(EVA) copolymer (Figure 4).

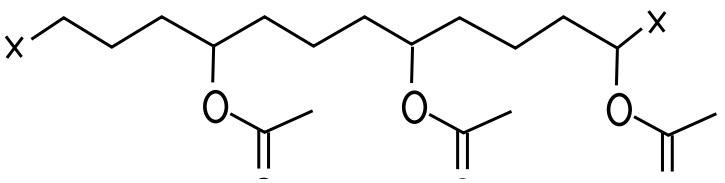

Figure 4. Ethylene vinyl acetate (EVA) copolymer.

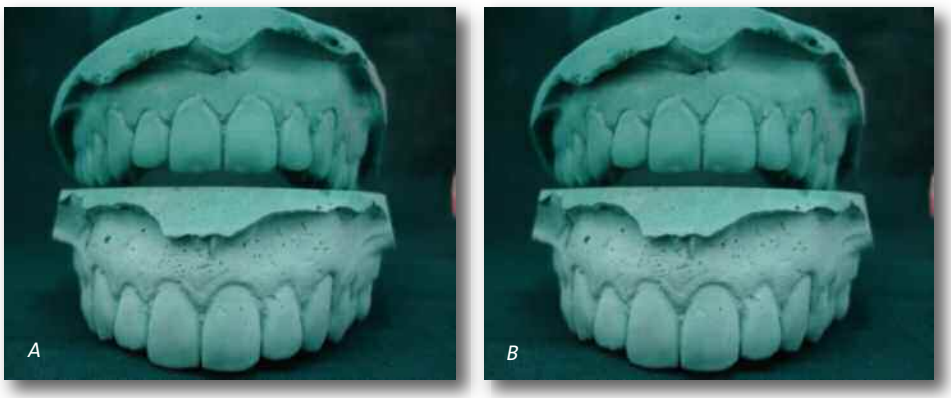

Figure 5. Custom made single layer and pressure laminated technique. *A*, Original and vacuum model. *B*, Original and pressure model.

Custom Vacuum-Formed Single-Layer Mouthguards

These are fabricated in the dental office for a custom fit. They are moderately expensive but provide good protection. Custom fitted mouthguards should fit over one arch covering all teeth, using the maxillary arch for class I and II malocclusion and the mandibular arch for class III malocclusion.[17] But it has been demonstrated that when a vacuum machine is used, the EVA material stretches unevenly over the model and the incisal edges become dangerously thin, and shrinkages of 25% occlusally and 50% labially and lingually have been reported.[5,18,19]

Pressure-Laminated Multiple-Layer Mouthguards

The deficiencies of the single-layer vacuum-formed design have been overcome by the use of lamination, i.e., the layering of mouthguard material to achieve a defined end result and thickness under a high heat and pressure environment. Efficient and complete lamination cannot be achieved under low heat and vacuum. The layers will not properly fuse together using the vacuum machine alone, but will chemically fuse under high heat and pressure[1,5] laminating two or three layers of polyethylene vinyl acetate-EVA copolymer using machines such as the

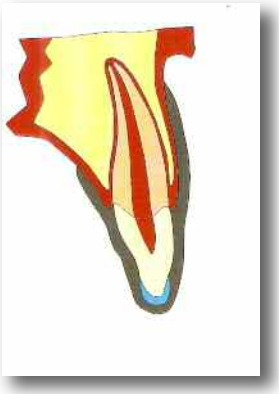

Figure 6A. Junior.

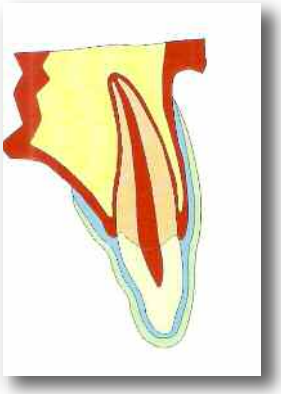

Figure 6B. Light.

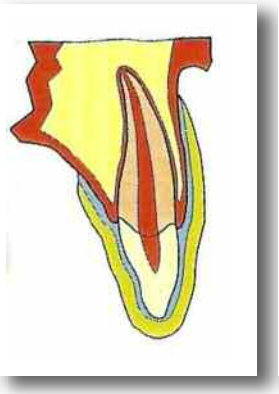

Figure 6C. Medium.

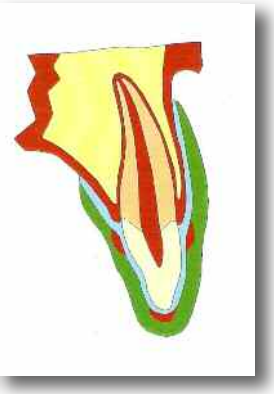

Figure 6D. Heavy.

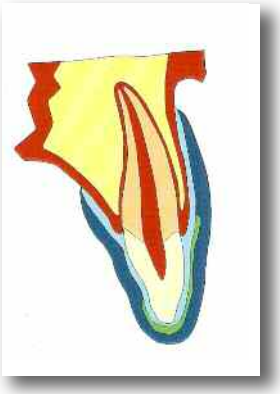

Figure 6E.

Drufomat, the Erkopress 2004, or the Biostar.[19] Pressure-laminated mouthguards are more expensive than the custom vacuum single-layer mouthguards; however, they provide the best protection and are recommended for full contact sports, especially since they can be fitted according to the athlete's sport (Figure 5).[16]

These mouthguards can be classed as Junior: 1 layer of EVA material (3 mm) with added incisal and occlusal protection. Designed especially for children with mixed dentition (Figure 6A).

The next classification is Type 1, Light: with two layers of laminated EVA material with a thickness of 3 mm. This type is designed for wrestling, volleyball, mountain biking, and motocross (Figure 6B).

The next is Type 2, Medium: with two layers of laminated EVA material with a thickness of 5 mm. This type is designed for soccer, rugby, basketball, softball, rollerblading, skating, and skateboarding (Figure 6C).

The next is Type 3, Heavy: with two layers of laminated EVA material with three unique power dispersion bands and 5 mm thickness. This type is specially designed for baseball, football, racquetball, martial arts, and boxing (Figure 6D).

The next is Type 4, Heavy Pro: with three layers of laminated EVA material (one hardened layer) with a 5 mm thickness. This type is custom designed for ice hockey, field hockey, street hockey, and kickboxing and other contact sports where blows from pointed objects are expected.[20,21] (Figure 6E).

However, there is a need to determine scientifically which mouthguard material is best, what material thickness is most effective for injury prevention, and which fabrication technique produces the best results for an individual athlete.[22]
The advantages of pressure formed lamination are:

1. Precise adaptation.
2. Negligible deformation when worn for a period of time. The combination of the relatively high heat and pressure used in construction of a laminated mouthguard means that the mouthguard material has virtually no elastic memory.
3. The ability to thicken any area as required as well as to place any inserts that may be needed for additional wearer protection (Figure 7).

Specific material thicknesses for the labial, occlusal and palatal aspects of a custom mouthguard have been recommended.[2] The suggested minimal thickness are labially 3 mm, palatally 2 mm, and occlusally 3 mm with extension into the vestibule 3 mm short of the labial fold.[15,16] The material of choice is ethylene vinyl acetate with a Shore hardness of 80.[15] Final mouthguard thickness typically is a matter of clinical judgment, patient preferences and the specific needs of the athlete or sport. Also to be considered is the patient's vertical dimension of occlusion, personal comfort and breathing ability. Protective thickness is also important because as the thickness of the mouthguard material increases logarithmically, the transmitted impact decreases logarithmically.[18]

Fabrication of Custom-Made Mouthguards

When fabricating a custom-made single-layer or multiple-layer mouthguard there are five stages to the fabrication: (1) dental

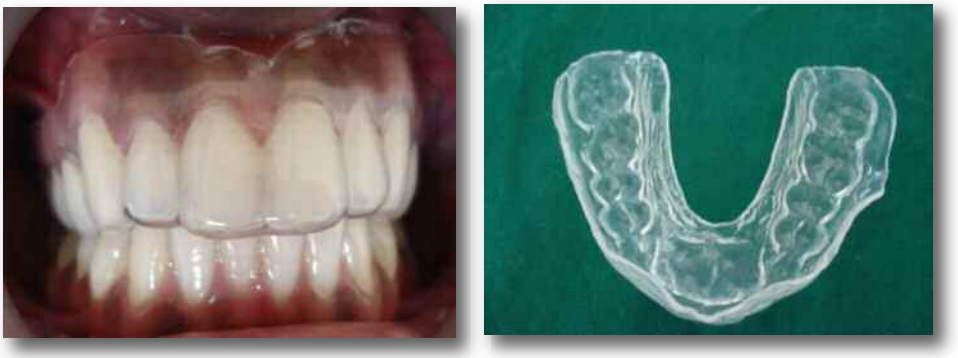

Figure 7. Custom made, pressure laminated mouthguard.

examination; (2) impression; (3) fabrication; (4) trimming and polishing; and (5) insertion and delivery.

Dental Examination

Custom mouth guards give the dental practitioner the ability to address important issues in the fitting of the mouth guard. Several questions must be answered before the custom mouthguard can be fabricated.[20] These questions include those addressed at the screening or dental examination. Is the mouth guard designed for the particular sport being played? Are the age of the athlete and the possibility of providing space for erupting teeth in the mixed dentition going to affect the mouthguard? Will the design of the mouthguard be appropriate for the level of competition being played? Does the patient have any history of previous dental injury or concussion, thus requiring additional protection in any specific area? Is the athlete undergoing orthodontic treatment? These are just several questions that should be answered at the examination to aid in providing the best design and quality of mouth guard.[16]

Impression

The impression is critical to the end result. Similar to any restorative procedure requiring an impression, the better the impression the better the appliance. It is important to cover all anatomical structures, especially all teeth and also the vestibular regions. Type III dental stone can be used for pouring of the cast. A base or art portion of the cast is not necessary. After the cast has hardened, the highest border should be marked with a pencil for reference during trimming. By including the vestibular borders, the mouth guard will have more retention, due to increased surface coverage. It will also help protect the alveolar bone from trauma.[19]

Fabrication

The process of fabrication is that of positive pressure not suck down (vacuum). A sheet of ethylene vinyl acetate is placed in the disc positioning ring of Drufomat. A trimmed model is placed slightly off centre towards the lingual. Two layers of 3 mm ethylene vinyl acetate will be laminated together. It is important that this process be done in two separate steps to allow for proper thickness in incisal and occlusal surfaces. If it is done in one step, the thickness in the critical areas of incisal and occlusal surfaces will be compromised. Pressure is used on the first layer and timing is crucial to maintain pressure. A proper cool down period of 10–15 minutes is essential to prevent distortion to the first layer of ethylene vinyl acetate. Once the material has cooled it is trimmed off using a hot knife or scissors. Next the mouthguard is ready for the second layer. It is very critical that the second layer become completely hot to predictably laminate to the first layer.

Trimming and Polishing

Once the mouthguard is cooled, the gross excess material is cut from the depth of the periphery of the cast using heavy trimming utility scissors. The mouthguard is removed from the cast and trimmed using small, sharp crown and collar scissors. It is essential to establish the vestibular border approximately 3 mm from the labial fold and the frena. On the palatal, the mouthguard should extend minimally 1 mm and distally at least up to the second molar. To enhance the patient's comfort, the margins of the mouthguard are trimmed using an acrylic bur or feathered with a finishing wheel on a lathe. To smooth the borders and occlusal surfaces, a torch or flame can be used to soften the material, after which the surface of the EVA can be lightly rubbed with a gloved finger coated with petroleum jelly.

Next the mouth guard should be tried in the patient's mouth to check for fit, retention, comfort, and acceptance. The vestibular region and frenum attachments must be checked to provide for a clearance of at least 3 mm from the labial fold to ensure comfortable movement of lips and cheeks. All adjustments should be made and completed at this appointment. To ensure proper occlusion in the molar region, the occlusal surfaces should be slightly warmed. The mouthguard should then be placed back in the patient's mouth instructing the patient to bite lightly into the mouth guard.

Insertion and Delivery

The final step in the delivery process is to inform and instruct the patient on proper home care of the mouth guard, as follows:

- Before and after using the mouthguard, it should be rinsed and washed with cold or lukewarm water to remove saliva build-up, bacteria, debris, and to minimize discoloration.
- To avoid distortion of the mouthguard it should not be scrubbed with abrasive dentifrices. Hot water, alcohol solutions, or denture cleansers should not be used to clean the mouthguard.
- Non-abrasive toothpaste on a soft-bristle toothbrush and rinses with a non-alcohol mouthwash are permissible. Occasionally, the mouthguard should be cleaned in cool, soapy water and rinsed thoroughly afterward.
- The mouthguard should be placed in a firm, protective plastic perforated container to store and/or transport it. This permits air circulation and helps to prevent damage. The mouthguard should not be stored in water or any solution.
- Like any other sports gear, a mouthguard will wear out, making it less effective. The mouthguard should be checked periodically for distortions, tears, or bite perforations.[13,16,17]
- Regular dental check-ups should be scheduled. Once these instructions are followed by the athlete, the mouthguard should be usable for at least two seasons. After that period of time passes, it is highly recommended that a new mouthguard be fabricated.[13,14,16]

To get the best service from a mouthguard an athlete should:

- not wear removable appliances, such as retainers, with a mouthguard;
- wear a custom-fitted mouthguard if the athlete wears braces or have a protruding jaw, receding chin, or cleft palate;
- not chew on or cut pieces off the mouth guard;
- wear the mouthguard during practice sessions as well as during games;
- schedule regular dental checkups and visit a dentist before each playing season; and
- bring the mouthguard to each dental visit.[14]

Different Uses for Custom Mouthguards

The greatest benefit of mouth protectors is

the reduction of injuries during sports-related activities. However, mouth protectors are also used with increasing frequency in other areas of therapeutic and preventive dentistry and medicine.[9]

Some of the uses for custom mouth protectors include:[9]

- Contact sports: The use of mouth protectors in contact sports effectively prevents oral injuries and preserves oral structures and thus fulfills two basic objectives of dentistry: prevention and preservation.
- Trauma therapy: Custom mouth protectors can be used as removable splints to stabilize avulsed or displaced permanent teeth.
- Mouth protectors have also been suggested as alternatives to intermaxillary splints for stabilizing selected osseous fractures.
- Custom mouth protectors have also been used in the emergency treatment of excessive bleeding after extraction of teeth. The mouth protector border seal can be improved by beading a cast to aid retention of thrombin and absorbable gelatine sponges over extraction sites.[22]
- Hospital therapy: Orthodontic appliances can be troublesome during intraoral orthognathic surgery. Cut wire ends, notched brackets, hooks, and buttons can impede surgery by catching sponges, tearing rubber gloves, and snagging sutures. Mouth protectors used as temporary covers can simplify oral surgery on patients with orthodontic appliances
- The protection of soft tissue in the treatment of chemical and electrical injuries, tetanus, and neuropathologic chewing in comatose and decerebrate patients
- Following free gingival graft surgery to protect the donor site.
- For chronic lip irritation from musical instruments.[9]

Conclusion

Safety is essential for maintaining oral health, and a properly fitted mouthguard can minimize the risks of sustaining oral injuries during participation in sports.[9] Health professionals should familiarize themselves with this treatment modality because the simplicity and cost of the custom mouth protector makes its use applicable to a wide range of patients for the preservation of oral structures from the effects of potential trauma.[5,9]

Conflicts

None declared.

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Effective Business Systems Enhance the Delivery of Quality Dentistry and Will Impact Your Bottom Line! Part III

Des systèmes d'affaires efficaces améliorent la prestation de services de dentisterie de qualité et influeront sur vos résultats essentiels – Partie III

By Ms. Jo-Anne O'Connor-Webber

IPCA

About the Author

Jo-Anne O'Connor-Webber is the president of IPCA, the developer of "Dental CATALYST Solutions," – which is committed to making business consulting for the dental industry more authentic, more effective, more efficient, more dynamic, and less complex. She is also a certified DISC behavioural studies trainer. Over the past 25 years, Jo-Anne has mastered the roles of: business manager, treatment coordinator, software trainer, practice management consultant, and mentor in the specialty and general dental practice.

Since 1984, Jo-Anne has been "hands on" in the prosthodontic, paedodontic, periodontic, orthodontic, and general dentistry practices. She has held integral business roles in practices that provide full mouth rehabilitation, implant placement and restoration as well as laboratory services. Jo-Anne continues to train dental teams on how to effectively educate patients on the benefits of comprehensive dentistry utilizing the case presentations skills taught in her consulting. She can be reached at: Phone: 519 574-5857; E-mail: info@dentalcatalystsolutions.com; www.dentalcatalystsolutions.com.

ABSTRACT

Would your practice benefit from increased case acceptance? It may surprise you that I am even asking this question! You may actually be thinking that this is a ridiculous question! Your immediate answer may be – "of course it would." It is a question that requires more careful consideration than most practice owners give before answering.

Every practice has the potential to increase its case acceptance. When realistic goals have been set, effective business systems are being executed by trained team and success is being monitored there is NO question that there will be an increase in the number of your patients who will agree to the treatment you recommend! Questions for you to consider when you have decided to take a comprehensive, effective approach to improving your case acceptance: (1) Do you know the truth in regard to what improves case acceptance and what does not? (2) Have you identified the interconnected business areas that need to be addressed in order to improve your practice case acceptance as I discussed in the second article of this series? (3) If you are unsure of the answers to the above are you willing to make the financial and time investment needed to find the appropriate solutions tailored to fit your practice?

RÉSUMÉ

Votre pratique profiterait-elle d'une augmentation des acceptations de cas? Le fait même que je vous pose la question peut vous avoir surpris. Vous pouvez peut-être effectivement penser que c'est une question ridicule! Votre réponse spontanée peut être, « bien sûr qu'elle en profiterait ». C'est une question qui demande plus mûre réflexion que la plupart des propriétaires de pratique ne lui en accorde avant de répondre.

Chaque pratique est en mesure d'augmenter ses acceptations de cas. Lorsque des objectifs réalistes ont été fixés, que des systèmes administratifs efficaces sont mis à exécution par une équipe qualifiées et que le succès fait l'objet d'un suivi, AUCUN doute qu'il y aura une augmentation du nombre de patients qui approuveront le traitement que vous leur recommandez! Voici les questions que vous devez vous poser lorsque vous avez décidé d'adopter un moyen complet et efficace d'améliorer votre système d'acceptation de cas : 1) Connaissez vous vraiment ce qui améliore l'acceptation de cas et ce qui ne l'améliore pas? 2) Avez-vous déterminé les secteurs d'affaires interconnectés qui doivent être réglés pour améliorer l'acceptation de cas de votre pratique comme on en a discuté dans le deuxième article de cette série? 3) Si vous doutez des réponses aux questions précédentes, êtes vous prêt à investir le temps et l'argent nécessaires pour trouver les solutions appropriées et adaptées à votre pratique?

Would your practice benefit from increased case acceptance?

It may surprise you that I am even asking this question! You may actually be thinking that this is a ridiculous question! Your immediate answer may be "of course it would," but this is a question that requires more careful consideration than most practice owners allow before answering.

Many continuing education programs attempt to entice clinicians to attend by using a marketing campaign that emphasizes "increasing your case acceptance" and alludes to being the step by step solution to all of your practice case acceptance concerns? Those delivering the programs often imply that on a macro scale case acceptance is the answer to ALL of your practice concerns and the answer will be revealed in this program!

As I discussed in the first article of this series, there are no magic bullets or short cuts to achieving the success you desire in your practice. Success lies within the discipline of our daily habits which, in the case of a successful dental office, requires effective and efficient execution of our clinical expertise and business systems *equally*!

Before we continue I must state an obvious fact: without clinical dentistry there is no need for practice business systems!

Accepted thinking states that the success of any business is 15% technical and 85% everything else. I recognize many people may believe that is true in all other businesses, but certainly not in the business of dentistry. Some may even feel insulted by this statement. Although interdependent, it is crucial that when we assess our practice in its entirety we separate the clinical and business aspects.

When stating that the business of our practice is only 15% of what takes place in the operatory, it is not my intent to be discrediting of the foundational aspect of the dental practice – your clinical expertise. I am also not suggesting that this percentage allows you to relinquish your professional responsibility of investing the time and finances required to achieve, maintain and improve your individual clinical expertise.

It is this level of clinical expertise which ultimately allows you to provide the patient with the highest standard of care. If this skill is in any way compromised then the quality of care you provide to your patient will be lessened and thus negatively impact dentistry as a profession. Hence the clinical expertise

of the individual dentist will dictate the future reputation and success of the profession as a whole.

If we accept the impact the quality of the individual practitioner's clinical expertise has on the long term success of the dental profession as a whole it emphasizes the importance of being discerning when selecting the clinical programs we support.

Every practice does in fact have the potential to increase its case acceptance!

When realistic goals have been set, effective business systems are being executed by trained team and success is being monitored there is NO question that there will be an increase in the number of your patients who will agree to the treatment you recommend.

The following are a few questions for you to consider when you have decided to take a comprehensive, effective approach to improving your case acceptance.

1. Do you know the truth with regard to what improves case acceptance and what does not?
2. Have you identified the interconnected business areas that need to be addressed in order to improve your practice case acceptance as I discussed in the second article of this series?
3. If you are unsure of the answers to the above are you prepared to make the financial and time investment needed to find the appropriate solutions tailored to fit your practice?

Before we discuss the factors that positively influence case acceptance, we should consider the less addressed topic of when increased case acceptance does not benefit a practice.

Simply put, a dental practice will be negatively impacted when the entire practice is not adequately prepared for the type or quantity of treatment being added to its schedule.

When the interconnected business systems including new patient, case presentation, scheduling, patient financial management, active patient management, and referral and lab case management are not properly incorporated and executed by trained team as part of the daily habits in our practices we risk creating chaos and loss of profitability.

A common example of this challenge is the practice in which the doctor has recently attended the type of clinical program mentioned in the opening of this article and returned excited to implement the new treatment. His or her enthusiasm may find them discussing the treatment immediately with their patients. If treatment is recommended and accepted by the patient the potential scheduling confusion created inconveniences both team members and the patient. In addition, if appropriate fees for the treatment are not established then these procedures are potentially unprofitable to the practice.

When we consider which changes enhance case acceptance and which changes do not we have to look at both the obvious and the not so obvious factors?

Although we just finished acknowledging the importance of an ongoing investment into your clinical expertise, it is often not your skills in the operatory that are the key factor in your patients moving forward with recommended treatment.

Typically your patient does not have the ability to accurately judge your level of clinical expertise for use as a deciding factor in accepting or declining treatment. Quite honestly your ability to deliver high-quality dental treatment is the absolute minimum your patients expect.

Most patients unconciously look for symbols of quality in other areas of your practice to determine the clinical treatment they have confidence in accepting.

Harry Beckwith in his book, *Selling the Invisible*, states "when you are selling a service you are really selling a relationship.[1] Although a patient will most likely not set up their initial appointment in your office with the mindset of *looking for an experience* they will frequently make their decision whether or not to remain a patient in your practice based on their overall impression (experience) created by your team and office environment.

Mr. Beckwith goes on to say, "Nearly half of the people (clients) surveyed by *Harvard Business* magazine, who had recently switched companies, indicated that they were not dissatisfied with the company they just left. Today we see that 20–30% of a company's clients will switch for no other reason than they don't feel a need to give their loyalty to their current provider."[1]

The long term success of our practice is enormously determined by the quality of our team, as it is our team, through their relationships with the patient and one another, who provide the experience the patient is unconsciously looking for. For this reason alone it is imperative that we devote the energy to developing our own and our team's people and leadership skills. This is often an element not given serious consideration.

Along with these dynamic relationships it is important to have a practice décor that conveys professionalism with current technologies evident in both the administrative and clinical areas. This contributes to providing the patient both a favourable overall experience as well as the symbols of quality mentioned earlier. My caution to you is to make sure your décor is not too eccentric or ostentatious in the eyes of your patient base that they might question your professional fees and become hesitant to accept treatment.

Proactive business systems allow us to put our relationships first!

Once we have established in our practices the various business systems which improve case acceptance we discover execution of these systems provides opportunities to give more personal attention to our patients.

In the second article of this series, I mentioned that intelligently designed *system forms* are a tremendous tool in prompting us through our daily tasks thus creating a

Active Treatment Summary

PATIENT:	DATE/TM
TREATMENT START ❑ Treatment direction confirmed/accepted by patient ❑ Medical history reviewed by Doctor ❑ Treatment plan reviewed with Doctor ❑ Treatment plan finalized	
❑ Treatment sequence completed ❑ Financial schedule completed ❑ Financial schedule signed ❑ Initial appointment set	
❑ Lab sent for diagnostic wax up to finalize treatment plan ❑ Lab sent for provisional prosthesis ❑ Lab sent for surgical stent *(use implant patient summary)*	
ACTIVE TREATMENT Referrals made *(use referral summary)* _____ _____ _____	
Changes to treatment plans *(use trx change summary)* _____ _____ _____	
POST TREATMENT ❑ Patient post treatment appointment schedule _____ ❑ Practice patient monitor updated	

COMMENTS

_____

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New Patient CE Checklist

PATIENT: _____

DATE/TM

New Patient Preliminary Information Completed _____

New Patient Welcome Letter Sent
- ❑ Personal & Medical Forms
- ❑ Map _____

New Patient Information
- ❑ Review personal & medical forms with patient
- ❑ Bill patient for NPX services rendered
- ❑ Predetermine at NPX Examination DDS/PTC or PTC
- ❑ Schedule patient's case presentation appointment
- ❑ Update & organize patient chart/computer information
- ❑ Print patient pictures _____

Treatment Planning
- ❑ Treatment planning worksheet, chart & models to DDS _____
- ❑ DDS call to participating Dentists _____
- ❑ Prepare patient "Treatment Letter" and Information Packet _____

Case Presentation
- ❑ Visual Aides
- ❑ Before and after pictures
- ❑ Models
- ❑ Information Packet
  - ✓ "Treatment Letter"
  - ✓ "Visual aides to take home" _____
- ❑ Necessary referrals made _____
- ❑ Referral thank you sent _____
- ❑ Follow up Set _____

COMMENTS

_____

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consistently effective routine allowing more time to spend creating a personal connection with your patients. System forms must be designed specific to the type of dental office you envision.

Provided here are two (2) of the system forms I have developed to assist my clients through their daily tasks – the new patient complete exam to case acceptance process – for you to review.

New Patient Preliminary Information

You will note that we finished the second article with the statement that case acceptance starts well before the new patient exam. When you refer to the **New Patient CE Checklist** you will note the first step to the new patient process is completing the patient's preliminary information either by phone or in person. Considering we now know that our patients are making decisions on whether or not they will remain in our practice based on their overall experience we need to make a careful assessment of this critical initial contact.

When a new patient contacts your office to schedule their first appointment you must have a form at hand that prompts the team member to collect the necessary information as well as provide the patient proper information to prepare them for their initial appointment.

It is imperative that the team member who is responsible for this task is highly professional, personable, confident, and possesses an exceptional understanding of the practice protocols. They will be responsible to educate the patient in regards to what they can expect at their first appointment, the financial policies for the practice, and the overall practice philosophy.

Consistency of Message

A consistent message from each team member throughout the office creates confidence with the patient and thus positively impacts the patient's willingness to proceed with treatment.

It is imperative that business team members have a complete understanding of and able to confidently support office policies. Each business team member's training must include education on the clinical procedures we provide, the usual stages of each of these procedures and the benefit to the patient of these treatments.

I have often witnessed a practice's case acceptance sabotaged following a treatment discussion with the doctor or assigned treatment co-ordinator when a patient engages in a conversation with an administrative team member and asks for further information regarding the treatment before making a decision. The team member reveals, often inadvertently, to the patient that they are unfamiliar with the treatment being recommended. This individual does not refer the patient to the appropriate person to answer the patient's questions or concerns. This scenario will bring the merits of the recommended treatment and the professionalism of the office into question by the patient who requires quality and consistent information before making a decision.

Scheduling

The practice schedule is your road map to success!

I have often said that scheduling is both an art and discipline. There are few team members who can establish on their own the critical guidelines necessary to execute a schedule that balances both patient needs and profitability.

It is key that your scheduling template provides the capacity to accommodate the patient's treatment without delay once they have agreed to proceed.

Practice Financial Policies

Each practice should have readily available an up-to-date internal practice fee listing to provide accurate financial estimates. This listing should clearly separate your professional and laboratory services estimates. If you use multiple commercial laboratories you may want to consider listing estimates from both if there is a significant discrepancy between their fees. I have found it helpful to establish an estimate for laboratory services that covers whichever lab is selected to participate in the patient case. It is always better for your patients that their estimate be a little high rather than too low so that the surprise is a positive one.

All financial arrangement options that may be offered to patients must be established well before the conversation explaining treatment takes place. Having signed and agreed to financial arrangements will significantly lessen the misunderstandings in this area and thus keep your accounts receivables consistently manageable.

It is important that team members understand the value of the services your practice provided and that they can confidently support your fees. Unfortunately, I have witnessed situations when a team member will tell a patient that they would not consider the treatment themselves as it was too expensive!

Comprehensive Diagnosis, Treatment Planning and Recommendations

We must continue to stress the importance of comprehensive diagnosis and treatment planning as part of our professional responsibility to our patient. Comprehensive treatment planning allows us to educate our patient as to their current oral health, provide them with treatment recommendations /options and caution them as to the possible consequences should they not consider moving forward with treatment. A treatment planning worksheet is an excellent system form that is essential to the success of this process.

Case Presentation

The case presentation appointment is an opportunity to solidify our relationship with our patient. People in general want to feel that their needs are important, they are being treated like an individual and they are being listened to. As mentioned previously in this series of articles, if we do not offer our patients treatment they cannot accept it!

The case presentation aspect of our effort to increasing case acceptance is a vital one! The following are some key ingredients to a successful case presentation:

1. **An understanding of the different personality temperaments.**
   Once you have a working knowledge of these temperaments you can apply this expertise to educating your patient and answering his or her questions and

objections according to their temperament style.

2. **Provide your patient with an easy to understand treatment letter that is reviewed with them before they take it home.**
   The usual computerized printouts list procedure codes and a service description meant for dental personnel. This is often confusing to the patient.
3. **Review with the patient an overview of each clinical procedure being recommended and its benefits to their overall oral health.**
   Patients will place greater value on the treatment being recommended when their understanding is elevated.
4. **A breakdown of total estimated fees for the services recommended by clinical professional fees and laboratory fees.**
   This provides the patient an accurate financial understanding of the services the patient would be receiving. I recommend it is clearly communicated verbally and in writing that all fees are estimated and subject to change.
5. **Setting a follow up time to call the patient to answer any questions or concerns they may have from your treatment discussion with them.**
   Contrary to the teachings of many, when involved in a case presentation, I consistently advise the patient that we are not looking for them to make a decision on that day. We want our patients to be actively involved in the treatment decision by appropriately reviewing the information provide and raise any questions or concerns they may need to have addressed. Following this when the patient agrees to treatment the patient is now an educated committed individual.

On a final note regarding case acceptance we need to recognize that just because our patient does not immediately accept the treatment we are recommending that they will not do so in the future or that the treatment recommendations are no longer valid. It is crucial we follow up with these patients in an organized format during future appointments and document these continued conversations in their chart. The key is that when they do decide to proceed with treatment that the information we have provided and the experience they have had in our office will see them confidently accepting your recommendations.

As touched on at the beginning of this article, the investment made in improving the business systems (processes, team leadership training, etc.) or "the other 85% of our business" is often neglected relative to the clinical component. It is often an afterthought given only a bit of air time" by the individual presenting the clinical program or by the sales representative of the company sponsoring the seminar. Unfortunately this format limits the opportunity for successful implementation into your practice of the very clinical training you just received.

I often hear comments from clinicians both new and seasoned who recognize the industry needs more authentic practice management training, but they are unsure where to turn for such training. Dentists who are experts in their area, being clinical dentistry, recognize that practice management training needs to come from individuals who are truly experts in the area of dental business management.

Research indicates that to be considered an expert or someone who is exceptional at what they do, worth listening to and taking advice from this individual must have demonstrated deliberate practice and extensive effort in a specific area over an extended period of time. It is generally referred to as the "10 year rule." Scientific as well as anecdotal studies have concluded that 7,500 to 10,000 hours are required to become an expert in an area of endeavour. This rule is accepted in the arts and sport as well as business and is considered to be somewhat of a universal concept. The critical distinction is that this person must be someone who has not merely done something, but continually aimed to improve their skills and abilities. This individual can then be said to possess authentic experience and expertise.

My caution to you is that if we accept the importance of receiving our training from an authentic expert, before we implement business strategies, we must be discerning of the dental specific practice management and business training coaching of the individual providing the information. A presenter may have extensive understanding and expertise as a clinician, a hygienist, a dental product representative, or industry advisor but is likely not an expert as outlined above.

The long-term success of our practices and the industry at large is reliant on *authentic experts* in both the clinical component and the effective business systems of dentistry to provide the ongoing training and mentoring in our industry!

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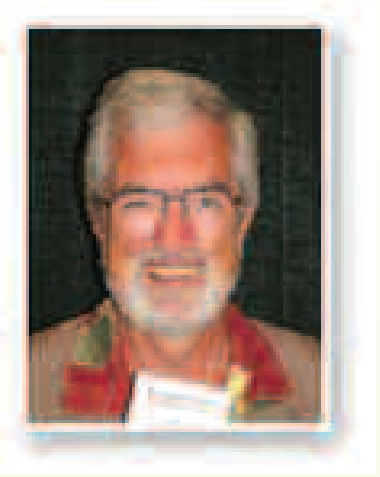

It is my privilege to welcome you to Calgary, Alberta for the eighteenth annual scientific meeting of the Canadian Academy of Restorative Dentistry and Prosthodontics. The Westin Hotel, the home for our conference, has just undergone a complete renovation which will hopefully add to your enjoyment during your stay in Calgary. Your committee has attempted to bring you an excellent scientific program as well as a social program that will allow you to both enjoy the educational and fraternal aspects of our Academy.

The pre-conference, hands-on course with Mr. Naoki Aiba will help to provide a method of bridging the communication gap between dentists and their lab technicians, using the wonders of digital photography and the internet. Mr. Aiba is world renowned for his photography and dental technical abilities and the participants should obtain full value for their attendance.

The scientific program for Friday and Saturday will offer members and guests of the Academy a fulfilling continuing education experience covering many areas in restorative and prosthetic dentistry in 2010 and the years to come. I am sure that there will be many gems that you will be able to bring back to your office.

Coming to invigorating environs of Western Canada it was felt necessary to offer you an opportunity to experience some horseback riding in the foothills of the beautiful Canadian Rockies and fly fishing on the Bow River. Those taking part in the fly fishing will be quite pleasantly surprised at the quality of this experience.

The excursion for the spousal program on Friday will offer an opportunity to visit Kananaskis, the home of the downhill events for the 1988 Calgary Winter Olympics and Canmore, the home of the cross country ski events. This trip will also offer an opportunity to shop for some excellent art and other merchandise with no sales tax.

Of course no trip to Calgary would be complete without an opportunity to attend a western barbeque, complete with western dancing and other activities. Our finale will be on Saturday evening with the President's Gala which will be a fun evening and another opportunity to enjoy the fellowship that our Academy in known for.

Enjoy!

Ed McIntyre
Conference Chair

Welcome Message from CARDP

It is an honor for me to serve as president of the Canadian Academy of Restorative Dentistry and Prosthodontics for the term of 2009/2010. The Academy members are both general dentists and specialists from across Canada and the United States whose primary interest is in Restorative Dentistry and Prosthodontics. Each year the Academy conducts an Annual Scientific Program featuring leading clinicians in their field. The Academy also features leaders in the dental industry, in the form of a trade show, to compliment the clinical sessions.

I would like to acknowledge the past president, Dr. Stan Blum, and his committees for their dedication in continuing the development of the Academy.

This year the host city is Calgary and the dates are October 14th to 16th, 2010. The convention hotel is the Weston Calgary Hotel where all the scientific sessions will be held as well as some of the social events.

Dr. Ed McIntyre, your convention chairman, Dr. Bernie Linke, clinic chair and Dr. Doug Lobb, table clinic chair, have arranged a stimulating scientific program whose theme is "Real World Dentistry - 2010 and Beyond". The social program is designed to renew or make new friendships while enjoying a unique western flare.

I extend a sincere invitation to all members and guests to attend this year's convention for a truly fulfilling educational experience and a social program to foster a camaraderie that can last a lifetime.

Sincerely,

Vernon Shaffner
President CARDP

Pre Convention & Social Activities

Horse Back Riding – Moose Mountain Adventures
Thursday, October 14, 8:00 am – 2:00 pm
Meet in Westin Lobby @ 7:45 am (Dress Warm, Casual)
Visit: http://www.packtrips.ca

Fly Fishing on the Bow River
Thursday, October 14, 7:30 am – 5:00 pm
Meet in Westin Lobby @ 7:15 am
Visit www.bowriverflyfishing.com (Dress Warm, Casual)

Conference Registration - Westin Calgary Hotel
Thursday, October 14, 11:00 am – 8:00 pm
Foyer – Conference Level

Hands on Course - Westin Calgary Hotel
Thursday, October 14, 9:00 am – 5:00 pm
DENTSCAPE: Dental Photography for Dentist-Laboratory Communications
Eau Claire Room, Lower Level

Opening Reception - Welcome Buffet - Westin Calgary Hotel
Thursday, October 14, 6:00 pm – 10:00 pm
Mayfair Rooms, Conference Level

Partner's Program - Tour, Dine & Shop - Kananaskis & Canmore!
Friday, October 15, 9:00 am – 3:00 pm
Meet in Westin Lobby @ 8:45 am (Dress Warm with Comfortable Shoes)
Visit: www.canmorealberta.com & www.kananaskis.com

Wild Western Night – Wainright Hotel, Heritage Park
Friday, October 15, 6:00 PM – 10:00 PM
Meet in Westin Lobby @ 5:45 pm (Dress Warm, Casual)
Visit: www.heritagepark.ca

President's Gala, Westin Calgary Hotel
Saturday, October 16, 6:30 pm – 12:00 am
Reception, Foyer Conference Level
Gala Dinner Dance - Britannia Room
Black Tie Optional

Average Temperature for Calgary, AB - October = High 12°C Low 1°C

Hands On Course

DENTSCAPE: Dental Photography for Dentist-Laboratory Communications
Thursday, October 14, 9:00 am – 5:00 pm, Calgary Westin Hotel

7 CE credits to be issued for this Course
Bring your Own Camera and Flash to exercise photo shooting.
Course to run from 9am to 5 pm, with breaks and one hour lunch to be provided.

BRIEF DESCRIPTION: "Dental photography" is not just taking photographs but also maximizing the use of them. An award-winning professional photographer and ceramist, Naoki Aiba, CDT will explain the fundamental of dental photography, and explore its use in daily practice by illustrating numbers of clinical cases fabricated solely with photographic information without seeing the patients. In this seminar, the participants are welcomed to bring their own camera and flash to exercise photo shooting with him.

COURSE OUTLINE:
Lecture "Dentscape: Dental Photography for Functional Esthetic," which illustrates:
Basic science of photography
Photographic equipments and useful accessories
Basic technique of dental photography
Concept and use of the "Shade View" photographs
Photos and study cast for designing pleasing midline and incisal edge line
Photo protocol for dentist-laboratory esthetic communication by case design
Shooting profile and settings of major manufacturers' camera and flash systems
Clinical case studies
Demonstration & Hands-on:
Set up of your camera system for the best exposure
Test shooting the Basic protocol (facial and intraoral photography)
Simple 4-step photo enhancement with Photoshop CS3 (for Mac users) and Photoshop Elements 5.0 (for Windows users).

LEARNING OBJECTIVES:

- To learn how to communicate with esthetic elements through photography between dentists and laboratory for fabrication of restorations.
- To understand how to overcome three most prominent esthetic challenges: Shade mismatch, canted mid-line, and unpleasing incisal edge line.
- To understand the concept and the use of "Shade View" to read, map, and analyze the information into ceramic fabrication.
- Learning the simple Photoshop workflow of the pictures into the dentist-laboratory communication.

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Continuing Education Recognition Program

Scientific Program

Meeting Schedule		October 14 - 16, 2010
Time	**Speaker/Activity**	**Topic/Location**
	THURSDAY, OCT 14/10	**Westin Hotel – Eau Claire Room Lower Level**
9:00 am	**Mr. Naoki Aiba**	**HAND'S ON COURSE - DENTSCAPE: Dental Photography for Dentist-Laboratory Communication**
	FRIDAY OCT 15/10	**Westin Hotel – Britannia / Belaire – Conference Level**
8:30 am	Dr . Vernon Shaffner	CARDP President
	Dr. Edward McIntyre	Meeting Chairman
	Dr. Bernard Linke	Scientific Program Chairman
	Dr. Douglas Lobb	Scientific Co-Chairman
8:45 am - 5:00 pm	**Dr. David Garber, DMD**	**Real World Dentistry 2010 Choices, Options and Alternatives**
10:00 am	Refreshment Break – With Sponsors	
12:00 Noon	Luncheon – With Sponsors	
3:00 pm	Refreshment Break – With Sponsors	
5:00 pm	Conclusion	
	SATURDAY, OCT 16/10	**Westin Hotel – Britannia / Belaire – Conference Level**
8:30 am	Dr. Bernard Linke	Scientific Program Chairman
8:35 am	**Dr. Kevin E. Lung, BSc, DDS, MSc,**	**Implants: The Good, the Bad and the Ugly**
9:30 am	**Dr. Glen Johnson, DDS, MS**	**New Dental Adhesives and Cements What Should You Use and When?**
10:30 am	Refreshment Break – With Sponsors	
11:00 am	**Dr. Robert Miller, DDS**	**Laser Surgery: Re-Engineering the Biologic Response**
12:00 Noon	**Mr. Naoki Aiba, CT Oral Design**	**DENTSCAPE: Dental Photography for Dentist-Laboratory Communications**
12:55 pm	**Closing Remarks, Toronto Announcement**	
1:00 pm -2:30 pm	CARDP Luncheon – Bonavista Room	
2:30 pm -5:30 pm	Table Clinics – Lower Level	

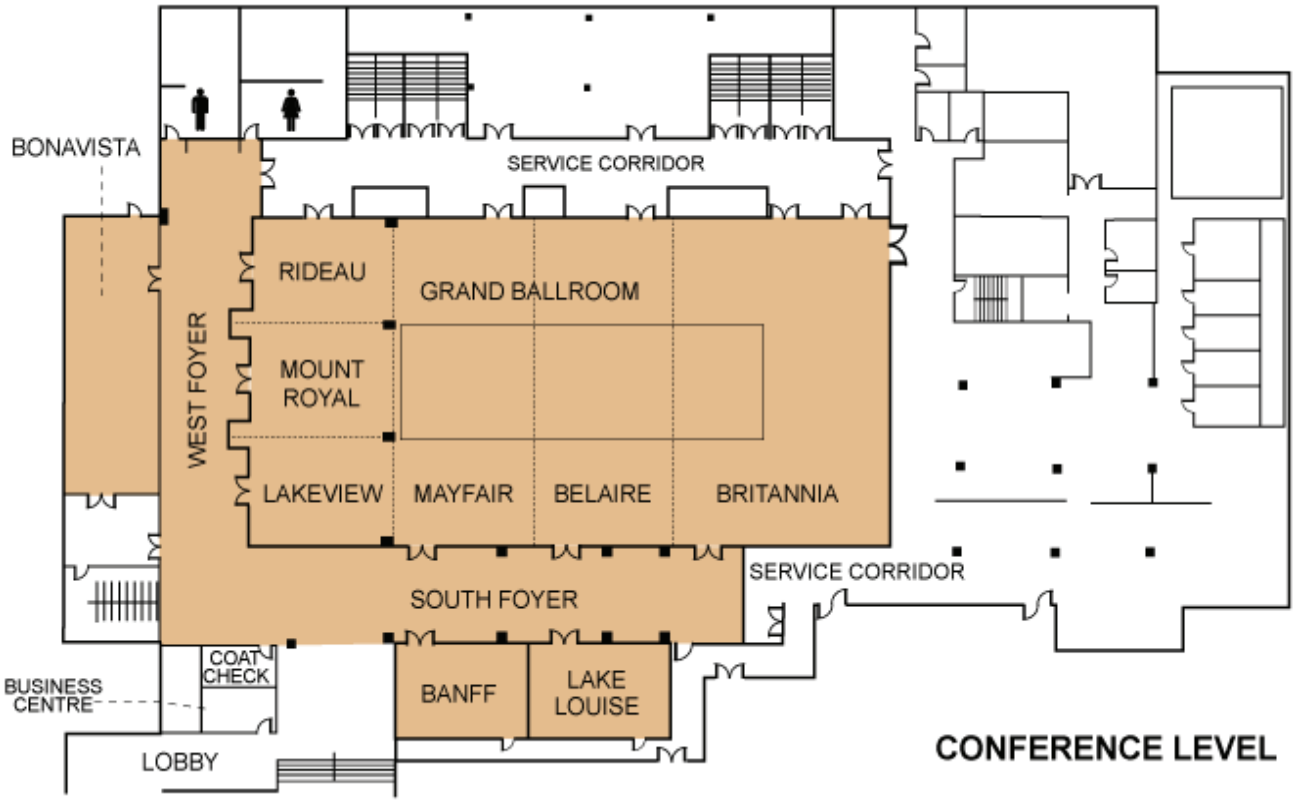
See Full Conference Program on Page 54

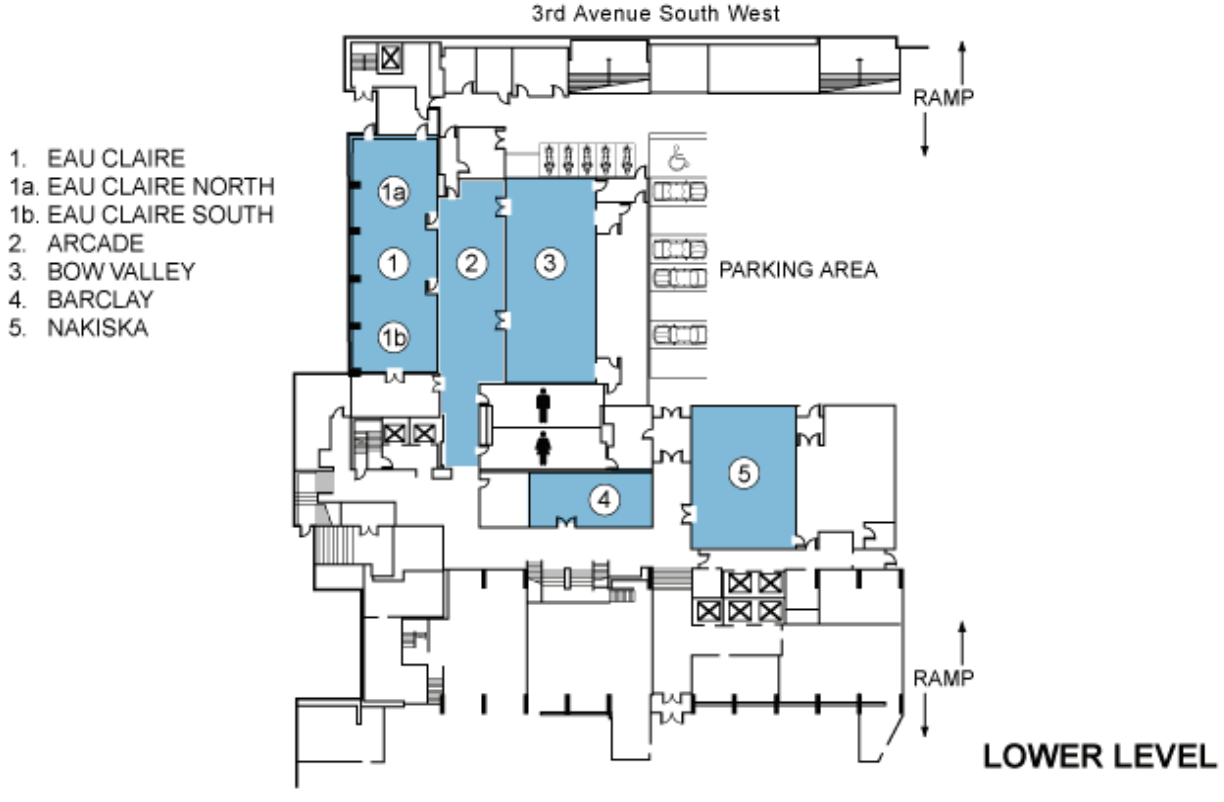
Conference Program

CONFERENCE PROGRAM - WESTIN CALGARY HOTEL

TIME		EVENT	LOCATION
		Wednesday, October 13, 2010	
6:30 PM	11:00 PM	CARDP Executive Dinner Meeting	Crown Parlour
		Thursday, October 14, 2010	
7:30 AM	5:00 PM	Bow River Fly Fishing	(Meet in Lobby of Hotel 7:15 am)
9:00 AM	2:30 PM	Moose Mountain Adventures Horse-back Riding	(Meet in Lobby of Hotel 8:45 am)
9:00 AM	5:00 PM	Hand's on Course– Naokia Aiba	Eau Claire Room – Lower Level
12:00 AM	11:59 PM	Scientific Set-up	Britannia / Belaire – Conference Level
8:00 AM	6:00 PM	Trade Show Set-up	Mayfair / Endrooms – Conference Level
11:00 AM	8:00 PM	Registration	Mirrors – Conference Level
1:00 PM	5:00 PM	Journal Meeting	Lake Louise – Conference Level
2:00 PM	5:00 PM	Clinic Meeting	Banff Room – Conference Level
6:00 PM	10:00 PM	Opening Reception with Sponsors	Mayfair / Endrooms – Conference Level
		Friday, October 15, 2010	
7:00 AM	5:00 PM	Registration	Mirrors
7:00 AM	8:30 AM	Breakfast with Sponsors	Mayfair / Endrooms – Conference Level
7:00 AM	8:30 AM	Essay Committee Meeting	Banff Room – Conference Level
8:30 AM	5:00 PM	Scientific Session	Britannia / Belaire – Conference Level
9:00 AM	4:00 PM	Partner's Program Kananaskis & Canmore	Meet in Lobby of Hotel 8:45 am
10:00 AM	10:30 AM	Break with Sponsors	Mayfair / Endrooms – Conference Level
12:00 PM	1:00 PM	Lunch with Sponsors	Mayfair / Endrooms – Conference Level
3:00 PM	3:30 PM	Break with Sponsors	Mayfair / Endrooms – Conference Level
6:00 PM	10:00 PM	Western Night @ Wainwright Hotel, Heritage Park	Meet in Lobby of Westin 5:45 pm
		Saturday, October 16, 2010	
7:00 AM	12:00 PM	Registration	Mirrors
7:00 AM	8:30 AM	Breakfast with Sponsors	Mayfair / Endrooms – Conference Level
7:00 AM	8:30 AM	CARDP Member Breakfast	Bonavista – Conference Level
8:30 AM	1:00 PM	Scientific Sessions	Britannia / Belaire – Conference Level
10:30 AM	11:00 AM	Break with Sponsors	Mayfair / Endrooms – Conference Level
1:00 PM	2:30 PM	CARDP Lunch	Bonavista – Conference Level
2:30 PM	5:30 PM	Table Clinics	Eau Claire / Bow Valley Rooms – Lower Level
6:30 PM	7:30 PM	President's Champagne Reception	South Foyer – Conference Level
7:30 PM	11:59 PM	President's Gala Dinner Dance	Britannia – Conference Level
		Sunday, October 17, 2010	
9:00 am	11:30 am	Clinic/Essay Executive Meeting	Banff Room – Conference Level

Calgary Westin Hotel Layout





Speakers

Friday, October 15th

Dr. David Garber, DMD

Topic: Real World Dentistry: 2010 and Beyond

Dr. David Garber is a member of the internationally recognized multidisciplinary group of educators known as "Team Atlanta." He is the recipient of the 2005 Gordon J. Christensen Lecturer Recognition Award, the American College of Prosthodontics Distinguished Lecturer Award, the Northeastern Periodontal Society Isador Hirschfeld Award for Clinical Excellence, the Greater New York Academy of Prosthodontics Distinguished Lecturer Award, and the David Serson Medal of Research.

He is a past President of the American Academy of Esthetic Dentistry and has served on the boards of both the AAED and the American Academy of Fixed Prosthodontics. Dr. Garber is clinician and professor in the Department of Periodontics as well as in the Department of Oral Rehabilitation at the Medical College of Georgia. He is a Clinical Professor in the Department of Prosthodontics at Louisiana State University as well as in the Department of Restorative Dentistry at the University of Texas in San Antonio. He is past Editor of the Journal of Esthetic Dentistry and co-author of Porcelain Laminate Veneers, Bleaching Teeth, Porcelain and Composite Inlays and Onlays, and Complete Dental Bleaching, and has published over 60 articles and textbook chapters.

Synopsis: Real World Dentistry 2010: Choices, Options and Alternatives: Today's changing world in dentistry involves innovative clinical techniques coupled with an ever-evolving group of new products. A return to "needs-based dentistry" from the era of elective care or "wants-based dentistry" requires that today's Dentist integrate innovative procedures with increased rapidity and predictability into their armamentarium. This program will address the following issues:

Learning Objectives:

Techniques

- Accelerated crown preparation
- Innovative porcelain veneer techniques
- Predictable bonding with today's new products
- Rapid esthetic temporization
- Simple esthetic soft tissue procedures for your generalist's practice
- Illusions of reality with "ovate pontics"
- Easy solving of esthetic dilemmas
- A simplified incisionless implant technique
- Bleaching—Practice maintenance!

New Products and Systems

- New ceramic systems—Procera, Emax, Lava. Problems and solutions
- Predictable bonding every time
- Creative crown systems — CAD cam / ceramometal?
- One-stage implants
- The new diamond burs
- Porcelain veneers by the numbers
- Composite solutions in 2010

This program will introduce you to new products and techniques that have already proven to be most effective in practice and will show you just **what to use, where to use it, and when**. It will address our need to meet the ever evolving public demand for **immediate dentistry** by integrating innovative restorative systems with implants and simplified basic periodontal procedures. It will update the generalist and specialist alike on state-of-the-art techniques and materials in restorative dentistry, esthetics, bonding, cosmetic and essential implants. This presentation includes a multi-media approach using computer simulation and video, which is designed for the **whole dental team including Dental Technicians.**

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E-Mail: dgarber@goldsteingarber.com

Speakers

Saturday, October 16th

Dr. Kevin E. Lung, BSc, DDS, MSc

Topic: "Implants: The Good, the Bad and the Ugly"

Dr. Kevin E. Lung is a certified specialist in Oral and Maxillofacial Surgery currently engaged in private practice at Kingsway Oral Surgery in Edmonton. He completed his Bachelor of Science at the University of Alberta in 1983 then entered the Dental School at the University of Alberta from which he graduated in 1987 with the Alberta Dental Association's Gold Medal. Dr. Lung was in general practice for three years in both St. Albert and Edson prior to returning to graduate school in Halifax. He undertook four years of postgraduate residency at Dalhousie University and graduated with a Master of Science in Oral and Maxillofacial Surgery. Following completion of this program, he secured additional fellowship training in Germany and Switzerland.

Dr. Lung has been engaged in an active oral and maxillofacial surgical practice in Edmonton since 1994. He obtained his Fellowship RCDC in 1995. He is currently Clinical Professor, Director of Implant Surgery Clinic, Faculty of Medicine and Dentistry at the University of Alberta. He is also serving as Section Head, Oral and Maxillofacial Surgery and Hospital Based Dentistry in the Edmonton Zone. In addition, he is the Chief, Pediatric Oral & Maxillofacial Surgery at the Stollery Children's/University of Alberta Hospital. He has been an Examiner in Oral & Maxillofacial Surgery for the Royal College of Dentists of Canada since 1998. He has an active involvement, as the Oral and Maxillofacial Surgeon, within the Northern Alberta Cleft Lip and Palate Clinic Team at the University of Alberta. He has also been an active fellow with COMPRU/IRSM at Misericordia Hospital since 2003.

Synopsis: Since the serendipitous discovery of Osseointegration, we as dental practitioners have been able to improve the quality of life for so many suffering and debilitated patients. The dental implant has been a vital and extremely successful treatment option in the reconstruction of these compromised masticatory systems. This modality has provided the dental profession with the technology to address many difficult challenges in both edentulous spaces and deformities. The majority of the patient outcomes, utilizing this technology, have provided patients with impressive esthetic and functional dental prosthetic treatment. These satisfying outcomes can only occur if the practitioner maintains the highest levels of understanding of the applications and the limitations of dental implants.

In this current health care environment the patient's elevated knowledge and awareness of dental implants is creating a significant demand for this treatment option. Therefore, more and more dentists are not only restoring but are completing the implant surgery. In addition, the expectations of the patients have also increased and that is why it is important that the application of proven implant dentistry principles must be maintained in order to avoid embarrassing and sometimes severely compromised outcomes. Hence, the dental profession cannot let the enthusiasm of implant reconstruction cloud good judgment or treatment. This presentation will review actual cases while attempting to demonstrate some important principles that will provide predictable and pleasurable outcomes (The Good) versus the compromised treatment outcomes (The Bad) or the esthetic disasters (The Ugly).

Learning Objectives:

- Understand that an implant is a foreign body that has treatment limitations
- Develop a structured assessment of the potential implant patient with the understanding of good implant surgery principles
- Recognize that complications do occur in implant dentistry and that predictable treatment strategies must be followed in order to avoid them
- Perceive possible treatment options to address implant complications

E-Mail: k.lung@kingswayos.com

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Speakers

Saturday, October 16th

Dr. Glen H. Johnson, DDS, MS

Topic: "New Dental Cements and Adhesives - What Should You Use and When?"

Dr. Johnson holds a Bachelor of Science degree in Mechanical Engineering (1968), a Master of Science in Bioengineering (1977), a DDS (1978), all from the University of Washington, as well as a Master of Science in Dental Materials from the University of Michigan (1983). Dr. Johnson is Professor, Director of the Division of Dental Materials Science, and served as Interim Chair of the Department of Restorative Dentistry at the University of Washington. His research focus remains with laboratory and clinical evaluation of new restorative dental materials and techniques. He has authored numerous articles in peer-reviewed journals, is a frequent presenter at scientific and professional meetings and has given continuing dental education courses in and outside North America.

Dr. Johnson is a member of the American Dental Association, the Academy of Operative Dentistry, International Association for Dental Research and the Pacific Coast Society for Prosthodontics. He is a past member and Chair of the ADA Council on Dental Materials, Instruments and Equipment. He served as the Biomaterials Consultant for the Journal of Prosthetic Dentistry and is a Consultant to the ADA Council on Scientific Affairs.

Synopsis: New products for dental bonding involving fewer steps are available. What does the evidence show? The various bonding systems will be discussed and recommendations will be given. There are a host of new luting agents on the market. What does the evidence show for selection and use of these cements and how does their crown retention compare to established luting agents? What cements can you use successfully with high-strength zirconium oxide crowns? How should one treat the internal surface of the zirconia crown for a most effective cementation? These topics will be addressed based on evidence from recent studies.

Learning Objectives:

- Understand the nature, advantages and limitations of new dental adhesives and luting agents and gain knowledge for the selection of products based on current objective evidence

E-mail: gjohnson@u.washington.edu

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Speakers

Saturday, October 16th

Dr. Robert Miller, DDS

Topic: "Laser Surgery: Re-Engineering the Biologic Response"

Dr. Miller received his B.A. from New York University and M.A. from Hofstra University, both in biology. He graduated with honors from New York University College of Dentistry where he received the International College of Dentists Award for clinical excellence. Following graduation, he completed a residency program at Flushing Hospital and Medical Center where he was involved in all phases of dentistry including facial trauma. Dr. Miller is a board certified Diplomat of the American Board of Oral Implantology/Implant Dentistry and Diplomat of the International Congress of Oral Implantologists. He is also a Master of the Implant Prosthetic Section of the ICOI and is a Fellow of the American College of Dentists.

Dr. Miller is Chairman of the Department of Oral Implantology at the Atlantic Coast Dental Research Clinic in Palm Beach and lectures on the surgical as well as reconstructive aspects of dental implants. He has lectured nationally on all phases of oral implantology and laser dentistry and founded The Center for Advanced Aesthetic and Implant Dentistry in Delray Beach, Florida.

Synopsis: Traditional resective surgical techniques may have unintended or undesirable effects on soft and hard tissue. As concepts move towards minimally invasive therapy, ablative laser techniques may have significant advantages over older resective procedures. Previous generations of dental lasers operate in vaporization mode. The high operating temperatures of these lasers results in charring of tissue and may alter the surface of dental implants. Erbium based lasers, using a photoacoustic process, may be used to sculpt soft tissue, contour bone and teeth, and treat the surface of implants to enhance healing and provide a more ideal tissue envelope for implant aesthetics. This new generation of lasers holds the promise of replacing much of the hand and rotary instrumentation currently used in surgery.

Learning Objectives:

- Understand the concept of minimally invasive surgical techniques
- Differentiate the multiple laser wavelengths and their indications/contraindications
- Identify the biologic response of hard and soft tissue when lasers are employed
- Develop a rationale for choosing a laser approach over traditional surgical instrumentation

E-Mail: DrRJMiller1@aol.com

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Speakers

Saturday, October 16th

Mr. Naoki Aiba, CDT, Oral Design

Topic: "DENTSCAPE: Dental Photography for Dentist-Laboratory Communications"

Born in Nagoya, Japan, Naoki Aiba graduated from the Dental Technology Program at the Dental School of Aichi Gakuin University in Nagoya in 1982 and completed the post-graduate ceramics course at the Tokai Dental Technicians School in 1986. He received the Young Speaker of the Year Award in 1989. In 1992, Mr. Willi Geller selected Naoki to be a member of Oral Design. He has lectured, conducted hands-on courses, published in more than thirty countries on ceramics, dental photography and dentist-laboratory communications.

He has published and exhibited his photographs around the world. He currently serves as a member of the Editorial Board for the QDT and is a Technical Advisory Board Member of the Monterey-Bay Salinas Study Club. He maintains his laboratory, Science Art, Inc. in Monterey, California, and offers hands-on seminars at his teaching facility, Oral Design Monterey.

Synopsis: Dental photography provides a means for bridging the gap between the patient and the technician. This lecture will discuss the method of overcoming three major esthetic challenges faced by the dental technician: shade matching, midline orientation and incisal edge position. An award-winning professional photographer and ceramist, Naoki Aiba will explain how he overcomes those challenges utilizing digital photography. He presents the fundamentals of dental photography, then addresses its practical uses in dentist-laboratory communication. In the latter half of the lecture, he will illustrate those applications in daily practice using clinical cases fabricated solely with photographic information, without seeing the patients. He will also discuss porcelain build-up and comment on the concepts of Transition Powder Technique™, Translucent Dentine Powder Technique™, Internal Staining Technique, as well as Pre-margin Correction Technique™ to improve marginal fit.

Learning Objectives:

- Read, map, and analyze the shade using “Shade View™”
- Learn photo protocol by case designs
- Learn camera and flash set-up of major Nikon and Canon systems for optimum exposure
- Apply esthetic information to advanced ceramic layering techniques and contouring using Willi Geller’s Creation Porcelain systems

E-Mail: naokiaiba@aol.com

ADA C·E·R·P Continuing Education Recognition Program

CARDP Exhibit Layout
October 14th - 16th, 2010
Westin Calgary Hotel, Mayfair Rooms

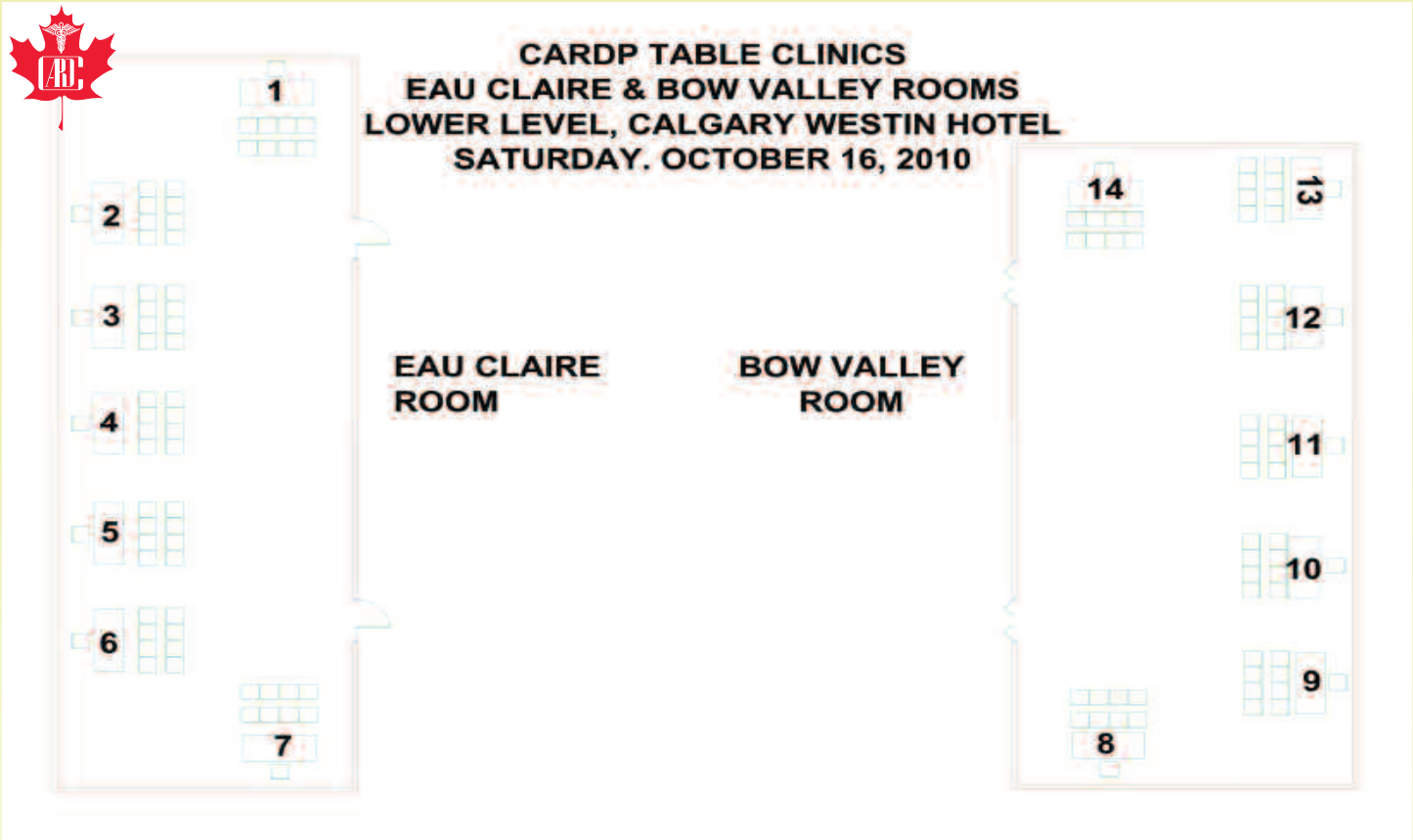

Table Clinic Presenters and Topics

1. **Bernard Guggisberg - "The ingenious stress free bar system on implant"**
2. **Anna Kajda -Simple steps on how to make bonding of indirect restorations predicatble and easy**
3. **Dr. Andrew Wasik - Emergence profile development with tempoization in highly aesthetic zone using Astra temporary abutment**
4. **Naoki Aiba - DENTSCAPE: Dental Photography for Dentist-Laboratory Communication**
5. **Dr. Matt Danchuk - Diagnostics and Treatment of Obstructive Sleep Apnea Therapy Ulilizing Oral Appliances**
6. **Dr. Robert Straga - Cone Beam Imaging for Surgical and Prosthetic Planning**
7. **Dr. Mark Sutherland - Digital Age in Dentistry**
8. **Dr. Terry Koltek - In Office Fabricated Appliances**
9. **Dr. Peter Walford - Treating Incisal Attrition, Fracture, and Augmentation with Composite Resin**
10. **Dr. Kerr Williamson - Dentistry in Afghanistan - Canadian Armed Forces**
11. **Don Kolotyluk - Implant impressions - Capturing True Tissue Emergence Profile**
12. **Dr. Nimet Adatia– Atlantis-Esthetic Abutment Selection Made Easy**
13. **Dr. David MacLean - Ending Confusion about Occlusion-the Bioesthetic Principles**
14. **Clarence Spring RDT, CDT - Temporize, Protect and Preserve with Drufomat Thermoforming**

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Past Presidents

Canadian Academy of Restorative Dentistry and Prosthodontics

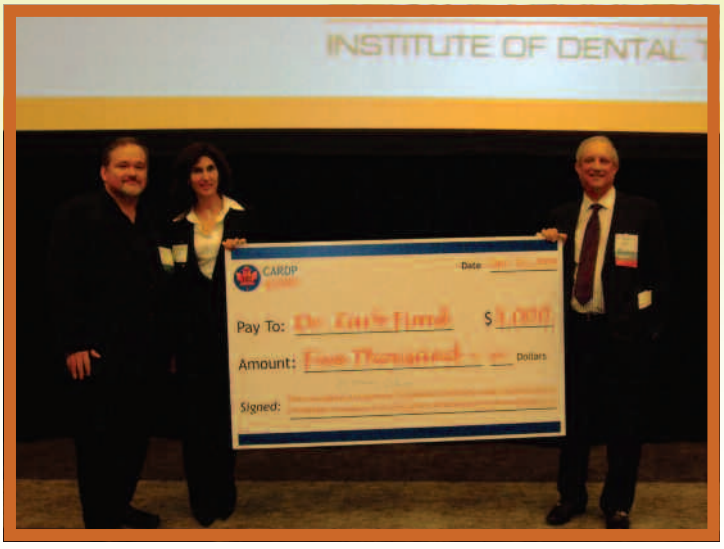
Stanley Blum	2009
Mike Racich	2008
Dennis Nimchuk	2007
Gorman Doyle	2006
Alan Osborn	2005
William H. Sehl	2004
Cary D.L. Letkemann	2003
Brian Friesen	2002
Hubert Gaucher	2001
Bernard Linke	2000
Robert J. David	1999
Michael R. Roda	1998
Edward McIntyre	1997
Allan R. Mills	1996
Graham G. Matheson	1995
Anthony H. Sneazwell	1994
George K. Scott	1993

Canadian Academy of Prosthodontics

Dennis P.A. Nimchuk	1992
Carl J. Osadetz	1991
David H. Charles	1990
Nasser Diabi	1989
Bruce M. Jackson	1988
Harry L. Gelfant	1987
Emmanuel J Rajczak	1986
Robert Hoar	1985
Andrew Tynio	1984
Michael W. Balanko	1983
Paul S. Sills	1982
Paul Jean	1981
Leon A. Richardson	1980
Arthur H. Irvine*	1979
Richard C. McLelland	1978
Francoise Michaud*	1977
Herbert Ptack	1976
Douglas V. Chaytor	1975
Georges A. Zarb	1974
W. Brock Love	1973
Jacques Fiset*	1972
A. Harris Crowson	1971
Donald Kepron	1970
Jean Nadeau	1969
Alan D. Fee	1968
William G. Woods	1967
Kenneth M. Kerr*	1966
James E. McCutheon*	1965
Wilfred D. Clark* (Charter Meeting)	1964
Charles H. Moses*	1963
R. Lawrence Twible*	1962

Canadian Academy of Restorative Dentistry

Craig Naylor	1992
Ernest R. Ambrose	1991
Leonard L. Kahane	1990
Andrew Tynio	1989
Stanley S. Kucey	1988
Vernon B. Shaffner	1987
Daniel C.T. MacIntosh	1986
Edward J. Abrahams	1985
Berl L. Mendelson	1984
J. Ivan Johnson	1983
B. Larry Pedlar	1982
Norman C. Ferguson	1981
E.S. Morrison	1980
Earl V. Gowda	1979
George K. Scott	1978
Owen J. Yule*	1977
Robert B. Telford	1976
Robert A. Clappison	1975
Emmanuel J. Rajczak	1974
Walter V. Grenkow*	1973
Douglas H. MacDougall	1972
D. Blake McAdam	1971
Sidney R. Katz*	1970
Jacques Fiset	1969
William R. Scott	1968
James D. Purves*	1967
J. Rod Fraser	1966
Harry Rosen	1965



ACDRP / CARDP Membership

Adams	Dr. Jonathan M.	Victoria	BC
Andrea	Dr. Maureen	Chester	NS
Akkad	Dr. Samer	Mississauga	ON
Anderson	Dr. Galia	Vancouver	BC
Arcache	Dr. Patrick	Montreal	QC
Balcom	Dr. Randy	Wolfville	NS
Band	Dr. Bruce M.	Scarborough	ON
Barzilay	Dr. Izchak	Toronto	ON
Beauchamp	Dr. Richard C.	Edmonton	AB
Beauchesne	Dr. Denis	Georgetown	ON
Bergen	Dr. David	St. Catharines	ON
Blair	Dr. David R.	St. Lambert	QC
Blomfield	Dr. John V.	Montreal	QC
Blum	Dr. Stanley S.	Montreal	QC
Boccia	Dr. Aldo	North York	ON
Boucher	Dr. Denis	Dieppe	NB
Brochu	Dr. Martin	Ottawa	ON
Busse	Dr. Richard	Vancouver	BC
Carr	Dr. Heather	Halifax	NS
Cleghorn	Dr. Blaine	Halifax	NS
Coburn	Dr. Andrew G.	Hamilton	ON
Coopersmith	Dr. Allan	Westmount	QC
Currie	Dr. Mary P.	Pointe-Claire	QC
Dabuleanu	Dr. Tudor	Toronto	ON
Dailyde	Dr. Arunas	Oakville	ON
Davidson	Dr. Thomas	London	ON
David	Dr. Robert J.	Montreal	QC
Donaldson	Dr. James	Thunder Bay	ON
Doyal	Dr. Gorman	Halifax	NS
Ellis	Dr. David	Kitchener	ON
Ennis	Dr. Leslie	White Rock	BC
Evans	Dr. Natalia	North Vancouver	BC
Farlow	Dr. Bruce	Peterborough	ON
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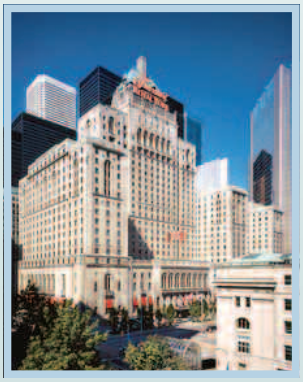

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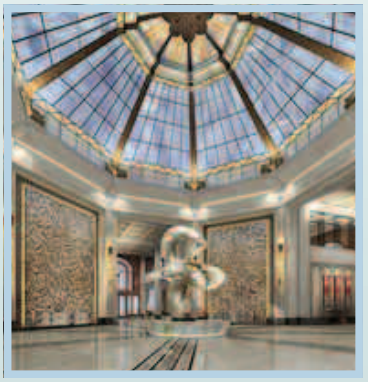

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Col NF, Eckman MH, Karas RH, et al. Patient specific decisions about hormone replacement therapy in postmenopausal women. JAMA 1997;277:1140-7.

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Galloway AC, Colvin SB, Grossi EA, et al. Acquired heart disease. In: Schwartz SI, Shires GT, Spencer FC, eds. Principles of Surgery, 6th edition. New York: McGraw-Hill; 1994:845-99.

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Le *journal canadien de dentisterie restauratrice et de prosthodontie* publie des articles revus par des pairs. Le *Journal* est principalement électronique ayant ses articles intégraux en ligne. De plus, une version papier des abstraits de chacun des articles est envoyée à tous les membres de l'ACDRP, aux souscripteurs à la version papier, ainsi qu'aux institutions et associations. Le *Journal* accepte les articles de recherche, les revues, les articles scientifiques, les rapports de cas, les résumés de livre, les anecdotes historiques, les trucs cliniques, les lignes directrices, les lettres à l'éditeur et ainsi de suite. Les conditions essentielles correspondent aux « Exigences uniformes pour les manuscrits soumis à des revues médicales » (http://www.icmje.org). Les politiques en matière d'éditorial pour la revue sont celles adoptées par le Conseil des éditeurs en sciences (http://www.councilscience editors.org/services/draft_approved.cfm). Le *Journal* sanctionne l'énoncé CONSORT (www.consort-statement.org) ayant trait aux normes pour l'amélioration de la qualité des rapports d'études sur les essais cliniques aléatoires.

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