Light Curing

A Guide from the Halifax Symposium

Page 19
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Some camps had portable dental equipment set up in trailers or under canvas, ready for visiting dental teams to use. Page 14

Look for CDA’s new practice support services website. Page 10

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Ebola toolkit for dentists
The Organization for Safety Asepsis and Prevention (OSAP) has updated its Ebola toolkit for dentists. osap.org/?page=Ebola
Drs. Nita Mazurat and Suham Alexander place this toolkit in a Canadian context on Oasis Discussions. oasisdiscussions.ca/2014/10/16/updated

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I recently returned from New Delhi, India, where I was privileged to lead the delegation that attended the FDI Annual World Dental Congress from September 8–13. Prior to this meeting, I had only imagined what life in India was like through books, photos and TV news clips. My stay in New Delhi, though brief, gave me a chance to glimpse daily life in India’s vibrant capital city where everything was exotic—the food, the animals, the traffic chaos! To say that New Delhi was unfamiliar compared to my home town of Mount Pearl, Newfoundland, would be an understatement.

Yet, when it came to the issues we discussed at the FDI meetings, I had the opposite realization: there is a commonality to the dental issues we care about in Canada and across the globe. FDI president, Dr. TC Wong, wrote in her message to FDI delegates: “FDI is heartened to see that factors such as water fluoridation, the use of fluoride toothpaste and a growing awareness of dental hygiene have translated into improvements in the oral health of Indians over the past two decades.”

Although her message was meant to highlight the oral health improvements in the Congress’ host country, it could equally apply to Canada or many of the countries represented at FDI. The global parallels in the issues facing the profession are many.

For example, consider 3 key issues discussed at FDI this year:

**Workforce distribution.** Of the 130 national dental associations represented at FDI, almost all countries—regardless of economic status—reported having an oversupply of dentists in urban areas or an undersupply in rural areas.

**Access to care for seniors.** This remains a challenge for all countries and is now a focus for future FDI projects.

**Sugar consumption.** There are calls for dentistry to join the fight against sugar consumption and reduce the public health challenges caused by obesity and dental caries. FDI supports the World Health Organization (WHO) recommendation that adults should consume no more than 10% of their daily calories from free sugars (p. 12).

Over the years, CDA has made a significant impact at FDI, “punching above its weight” through its participation in debates on these and other issues. This impact is shown through CDA’s input on FDI policy statements, which are used by the WHO, governments and dental associations around the world. By combining resources and efforts of its member countries, FDI provides a unique forum for influencing global policies on oral health.

I would encourage you to visit the FDI website (fdiworldental.org) to learn more about FDI initiatives such as new guidelines on restorative materials and the Minamata Convention on Mercury, and details about World Oral Health Day—set to take place on March 20, 2015.

CDA’s membership in FDI is important, as we gain a window to the state of dentistry worldwide through our participation. I am proud to be a part of CDA’s continued commitment to international dentistry and to bring a Canadian perspective to discussions on oral health issues.

**Gary MacDonald, DDS**

president@cda-adc.ca
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FIRST VISIT, FIRST TOOTH
Four Ways to Welcome Infants by Age One

An infant’s first tooth is an important milestone and should be celebrated not only by parents and family, but also by you and your dental team.

The first dental visit is a great opportunity to establish a relationship with the young patient’s family and create a “dental home” for years to come. It also allows you to bring the parents into a discussion about establishing good oral health habits for their child, while reinforcing the cornerstones of oral health: balanced diet, brushing, flossing, and seeing the dentist regularly.

Parents might not be aware that an infant’s first tooth signals the need for a visit to the dentist. Some parents may need to be reminded about the importance of scheduling a dental visit for their child every year, starting in infancy—just like their child’s regular appointments with a family doctor.

CDA recommends that children visit the dentist by age one or within 6 months of the eruption of the first tooth. Yet many dental offices have their own time frame for this first visit. If you want to adjust your office policy to closely follow CDA’s recommendation, your dental team may need some tips on how to best serve the needs of your youngest patients. Here are some ways to welcome infants to your practice:

1. Engage with parents.
   When new parents (or expectant parents) visit your practice, it’s a perfect opportunity to let them know why it’s important to see their child by age one or within 6 months of tooth eruption.

2. Get your team onside.
   Like any change in office policy, your entire team will need to be briefed so they understand why the change was made. Make sure the front office staff who book appointments understand the policy, and that your dental team reinforces your recommendation for a first visit.

3. Celebrate the occasion.
   Find your own unique way to make the first visit a warm and positive experience for both the infant and parents. Infants respond well to positive reinforcement, so a happy first appointment will bode well for future visits. Parents will also be more likely to schedule regular appointments if they see you have made an effort to make this a happy occasion.

4. Get the word out.
   Be clear to your patients and your team that parents should book their child’s first dental appointment by age one or within 6 months of first eruption. CDA has provided a ‘First Visit, First Tooth’ poster in the polybag of this edition of CDA Essentials to help convey this message. We invite you to display this in your practice to open a conversation about the first visit.
CMAJ Editorial Calls Attention to Oral Health of Seniors

An editorial in the September issue of the Canadian Medical Association Journal (CMAJ), co-authored by Dr. John O’Keefe, director of Knowledge Networks at CDA, and Dr. Diane Kelsall, deputy editor of CMAJ, focuses on the oral health of Canadian seniors. The authors underline the need for improved access to dental care for seniors with oral disease.

The joint editorial paints a discouraging picture of a vulnerable group: seniors with caries or periodontal disease who can’t afford to pay for the treatment they need.

“The Canadian Health Measures Survey showed that more than half of seniors in the community did not have any dental coverage, and about 39% were covered by private insurers. More than 1 in 10 older people reported avoiding dentists, and about 16% declined recommended dental treatment because of the expense. Severe periodontal disease was most prevalent in those without health insurance. In fact, a lack of health insurance was the only factor that appeared to influence the prevalence of severe disease.”

CDA is working to improve the oral health of seniors. Through the National Oral Health Action Plan, CDA initiated discussions about how to improve the oral health of seniors and other vulnerable groups. For seniors living in long-term care facilities, CDA is advocating for minimum standards of oral health care: an oral health screening on admission, an annual oral exam by a dentist, and a daily mouth care plan along with infrastructure to support the delivery of dental care within the facility.

In fact, a lack of health insurance was the only factor that appeared to influence the prevalence of severe disease.”

Alberta dentists can access CDA’s new practice support services website

The new website allows dentists to access and manage their CDAnet service subscriptions online instead of the current practice of faxing paper forms to CDA. The staged launch begins in Alberta this fall and will expand nationwide in early 2015.

Although some of the services available on the website will be familiar—like CDAnet, the ITRANS Claim Service, and eReferral—it introduces dentists to a new CDA service: CDA Digital IDs. These digital IDs replace the ITRANS certifi-cates dentists use for the ITRANS Claim Service and authenticate a dentist for online claims transactions. This capability, which minimizes the potential risk of identity theft, is only available in Canada through CDA.

Sign in information was mailed to Alberta dentists in October. After signing in, go to the Support link on the Practice Support section of the CDA website for more information or call the CDA Practice Support Services Help Desk at 1-866-788-1212.

CDA is launching a new website that will make claims-related services and e-Referral available to dentists through one central location.

4 reasons to use CDA’s practice support services website

1. To sign up for (or renew) your subscriptions to CDAnet, the ITRANS Claim Service, or eReferral.
2. To download the CDA Digital ID when your current ITRANS certificate expires.
3. To verify the information that is on file for your dental office, such as email and mailing addresses.
4. To add or delete a dentist from your CDAnet office profile.
CAHS Report URGES ACTION on care for vulnerable Canadians

In September, the Canadian Academy of Health Sciences (CAHS) released a report titled Improving Access to Oral Health Care for Vulnerable People Living in Canada. The report provides a comprehensive analysis of inequalities in oral health and access to dental care, highlights major problems contributing to these issues, and offers recommendations to help remedy the situation.

CAHS REPORT URGES ACTION on care for vulnerable Canadians

CDA: Why did the CAHS commission this report?
Dr. Paul Allison: It was commissioned because of the increasing body of evidence showing that there are problems of access to dental care for many vulnerable groups. CAHS itself acknowledges in its oral health strategy that this is an issue. There’s also a broad consensus across the Canadian dental community that this has to be addressed. The release of the 2007–09 Canadian Health Measures Survey was very timely; the survey provided us with quality data in terms of oral health and access to dental care, which we used to document and describe the problems of access to dental care in Canada.

From your perspective, what are the most important recommendations in the report?
First of all, we need to make sure everybody understands the issue. We need to raise awareness not only within the dental profession but also among other relevant health care professionals, the public, and decision-makers.

Another key element to focus on is the development of strategies to address the issue. Cost weighs heavily when it comes to oral care, but it’s not the only factor. We need to determine what we want to provide to vulnerable groups in terms of care—preventive, restorative and other forms—and come up with systems we can test out.

What do you hope will be the next steps?
I hope very much that people take it seriously and engage in this discussion, and that the dental profession seizes this opportunity to address problems of access. The report is in line with CDA’s National Oral Health Action Plan; there is common ground for CAHS, the Association of Canadian Faculties of Dentistry (ACFD) and many other national and regional dental organizations to work from.

The CAHS is not an organization that will itself get involved in the debate; its mandate is to produce reports related to health and health care in Canada. It’s up to those of us interested in this issue to move the recommendations forward. As a member of the dental profession, I’m trying to promote the debate. I’d like to get CDA and other dental and other health care professional organizations together to discuss how we can act upon the findings and recommendations.

Access to care is a complex issue, and there is no one way of tackling it. That said, I hope people acknowledge there is a problem and commit to moving forward in a concrete way. There are many ways of addressing the inequalities. We shouldn’t let any perceived obstacles stop us from starting the climb.

This interview has been condensed and edited.

To listen to the full interview visit oasisdiscussions.ca/2014/09/15/cahs

REPORT HIGHLIGHTS

Core problems with regards to access to oral health care
- Vulnerable groups living in Canada have both the highest level of oral health problems and the most difficulty accessing oral health care.
- The public and private oral health care systems in Canada are not effective in providing reasonable access to oral health care for all vulnerable people living in Canada.

Recommendations
1. Communicate with relevant stakeholders concerning the core problems raised in the report.
2. Establish appropriate standards of preventive and restorative oral health care to which all people in Canada should have reasonable access.
3. Identify the health care delivery systems and the personnel necessary to provide these standards of oral health care.
4. Identify how provision of these standards of preventive and restorative oral health care will be financed.
5. Identify the research and evaluation systems that monitor the effects of putting these recommendations into place.
The Foundation recommends a limit to the amount of sugar an individual consumes each day: 10% of total calorie intake and ideally less than 5%. For an average 2,000 calorie-a-day diet, 10% is equivalent to about 48 grams of sugar (12 teaspoons) and 5% is equivalent to about 24 grams of sugar (6 teaspoons).

The recommendation is based on consumption of “free sugars,” defined by the World Health Organization (WHO) as sugars and syrups added to foods during processing or preparation, plus sugars found in honey, syrups and fruit juices. The recommendation does not include sugars found in milk, vegetables, fruit, legumes, grains, seeds and nuts.

According to some estimates, free sugar consumption among Canadians exceeds 11-13% of total calorie intake. Sugary drinks, like soft drinks and sports drinks, are the largest single contributor of sugar in the diet, with one standard sized soft drink (355 mL) delivering up to 40 grams (10 teaspoons) of sugar.

The recommendation supports those of the WHO, which released its draft guideline on sugars in March.

Heart and Stroke position statement: heartandstroke.com/site/c.jkJQLcMWJTF/b.9201361/k.47CB/Sugar_heart_disease_and_stroke.htm

CDA’s suggestions for cutting down on sugar: cda-adc.ca/en/oral_health/cfytdental_care/nutrition.asp

CDA’s Position Statement on Junk Food and Child Health cautions against drinks with high sugar content: cda-adc.ca/_files/position_statements/junkFoodAndChildHealth.pdf

NEW LABELS FOR OPIOIDS
Encourage Safer Use

Health Canada has changed the labels on controlled-release opioid pain medicines to encourage their safer use. The new labels provide clearer guidance on patient selection and clarify the risks associated with their use.

The label changes apply to all classes of controlled and extended release non-generic opioids, although they will soon be implemented for generic opioids.

Changes on the new labels include:

• Removing approval for use with “moderate pain.”
• Clarifying that the prescription of controlled-release opioids are indicated for “management of pain severe enough to require daily, continuous, long-term opioid treatment that is opioid-responsive and for which alternative treatment options are not adequate.”
• Adding stronger warnings about the dangers of opioid addictions and clarifying the risks, including the risks to children accidentally exposed to opioids and to newborns exposed during pregnancy.

Dentists have an important role to play in preventing harms caused by the use, misuse, or abuse of prescription pain killers and other opioid drugs, through their prescribing practices and patient communications.

Heart and Stroke position statement:

For more information on Health Canada’s labelling change, visit healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2014/41157a-eng.php
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The Royal Canadian Dental Corps: DEPLOYMENTS IN THE GULF AND BALKAN CONFLICTS

In the lead-up to the 100th anniversary of the Royal Canadian Dental Corps (RCDC) in 2015, this article is the fifth in a series that brings to light the history of the RCDC over the last century, celebrating the heritage, accomplishments and dedication of the dental services personnel of the Canadian Armed Forces. During the time of the Gulf and the Balkan Wars, RCDC was known as the Canadian Forces Dental Services.

The Gulf War, 1990-91
In the early 1990s, Canada deployed three ships, a field hospital and a CF-18 fighter jet squadron with 4,000 personnel in response to the Iraqi invasion of Kuwait. HMCS Protecteur had a dental team on board that treated dental emergencies from all of the multinational coalition ships. Captain Margaret Cupples and Sergeant Chris Simpson were the first Canadian Forces dental team to sail in a war zone in many years.

The Canadian Forces Dental Services (CFDS) also deployed a military oral and maxillofacial surgeon and assistant to the Persian Gulf on board USNS Mercy, a 1000-bed US Navy hospital ship. The USNS Mercy and HMCS Protecteur operated in different geographic areas within the Persian Gulf. Both ship’s dental teams were rotated after several months on station.

A dental detachment was also deployed with 1 Canadian Field Hospital. Their original task was to provide dental care for hospital patients and prisoners-of-war, but due to a lack of patients they concentrated their efforts on treating allied personnel.

The Balkan Conflict, 1992-2004
Over 40 dental teams of the CFDS, consisting of a Captain Dental Officer and a Sergeant Dental Technician, were deployed on 6-month tours in the former republic of Yugoslavia. Up to three teams were present in theatre at any given time.

Dental personnel were located in various camps and would use mobile dental clinics to visit other camps. Some camps had portable dental equipment set up in trailers or under canvas, ready for visiting dental teams to use. For dental emergencies, patients were evacuated to the dental team’s location.

The summer of 1998 saw open hostilities between Federal Republic of Yugoslavia forces and the underground Kosovo Liberation Army. The dental team of Captain Jason Comeau and Sergeant Nora Larocque faced many challenges during the Kosovo operation, as their camp was located only four kilometres from the Macedonia/Kosovo border.
Captain Jason Comeau and Sergeant Nora Larocque faced many challenges during this operation, as their camp was located only four kilometres from the Macedonia/Kosovo border. When the NATO air campaign started in March 1999, the risk of the camp being hit with both enemy and friendly fire was very real.

A dental technician, Master Warrant Officer Leslie Burton, was chosen as the first Canadian to be named Squadron Sergeant-Major at the Role Three Multinational Integrated Medical Unit in Šipovo, a position traditionally filled by Dutch medical forces. She was also the first Dental Corps member of this rank level to deploy overseas since Korea.

CDA is playing a central role in commemorating the 100th anniversary of the RCDC in May 2015, reflecting CDA's role in establishing a military dental service in Canada and the close partnership between CDA and RCDC since that time.

---

1. Master Warrant Officer Leslie Burton (l.) with Allied colleagues in Šipovo.
2. A Canadian Navy auxiliary oil replenishment vessel conducts a simultaneous jack-stay transfer during the Gulf War.
3. Captain Jason Comeau and Sergeant Nora Larocque, in the former Yugoslav republic of Macedonia (Op GUARANTOR).
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SEXUALLY TRANSMITTED INFECTIONS AND DENTISTRY

Changes in the epidemiology of sexually transmitted infections (STIs) have influenced the oral complications of patients presenting for care in dental clinics. CDA spoke with Dr. Joel Epstein about the role of dentists in recognizing and managing oral manifestations of STIs.

CDA: What has changed in the epidemiology of STIs?
Changes in sexual behaviours over the last few decades, such as those related to the age of first sexual encounters, number of sexual partners or oral-genital contact, are linked to changes in the epidemiology of STIs. Some of the older diseases are making a comeback. For example, cases of gonorrhea and syphilis are dramatically increasing in North America. These STIs have oral manifestations and are potentially transmitted through direct oral contact.

Have there been related changes in the epidemiology of oral disease?
There’s been a change in the epidemiology of head and neck cancer related to STIs. Human immunodeficiency virus (HIV) leading to host immunosuppression may result in a number of oral manifestations, including oral squamous cell cancer and lymphoma.

Human papillomavirus (HPV) is also a sexually transmitted virus; in the head and neck it is responsible for causing many cases of oropharyngeal cancers, which are increasing in number, and also a portion of the oral cancers. As a result, the population with the greatest risk for cancers in the head and neck has changed. Traditionally, older individuals with a history of tobacco or alcohol use were at the greatest risk, but now HPV-induced cancers are seen in younger adults, sometimes in the absence of traditional risk factors.

For HPV-induced cancers, the response to current standard treatment is much better than tobacco and alcohol-induced disease and the prognosis is greatly improved. But this also means that there are oral complications of cancer therapy that require dental knowledge and management for the increasing numbers of long-term survivors.

What are the implications for dentistry?
Oral manifestations of STIs require that dentists play a role in detection, diagnosis, health education and ultimately management of oral complications. How do you present this information to patients? It’s important to know about potential transmission of STIs and the implications for oral care.

Is today’s dentist equipped with the knowledge and skills required to deal with this change in oral manifestations of sexual behaviours?
Dentists are in the best position to identify abnormalities in the oral cavity and oropharynx and broadly in the head and neck—and what they may represent. Recognizing differences or deviations from normal is the first step in diagnosis. But they also need to have a broader appreciation of STIs that they might identify. This will facilitate earlier detection and diagnosis and potentially better outcomes of patient management.

What is the best way to approach a conversation with your patient about STIs?
This can be a challenge because the curricula in dental schools do not prepare the dental provider for discussing negative medical news. So if a dentist diagnoses a cancer or a potential cancer, we are limited by teaching and experience in providing bad medical news to patients in the dental setting. We’re really not taught how to speak with patients about serious medical conditions. Similarly, how do you talk to patients in the dental setting?
office about past sexual activities, based upon an oral finding? But talking with patients about personal behaviours is an important part of providing comprehensive oral care; things like sexual habits and sexual history, as well as the other risk factors for various oral diseases like tobacco use, alcohol use and other drug use should be queried.

Discussing a challenging or stress-inducing suspected diagnosis requires preparation by the dentist. It is important to obtain background information on the condition, diagnostic procedures, and the anticipated therapy; this can be obtained by contacting the practitioner to whom referral is planned. Have a plan and present it as positively and directly as possible. Know who you might refer to and why, and the principles of the anticipated next steps in diagnosis or treatment.

For example, referral of early stage cancer has a positive effect on prognosis, and is often associated with less complex and aggressive treatments. The conversation should be held in the proper environment, like a private setting in the practice environment, not over the phone or in a waiting room.

Most of the time a dentist will have a positive message about early detection. Over the years, the dental community has done well in communicating messages about prevention and early detection—extending these messages to include sexual behaviour and oral and general health is part of a broadening role for dentists in health care.

Dr. Deborah Saunders is medical director at Health Sciences North (formerly Sudbury Regional Hospital) in the department of dental oncology in Sudbury, Ontario. For the 2014 Ontario Dental Association (ODA) spring meeting, Dr. Saunders coordinated a series of panel discussions on STIs and their implications for dental practice. The symposium aimed to highlight the role that dentists can play in the prevention, diagnosis and management of STIs and in bridging the gap between dentistry and medicine.

The ODA has kindly made 3 patient fact sheets available to Canadian dentists:
- Mouth Problems and HIV
- Herpes Simplex Virus Infection
- HPV-Positive Oropharyngeal Cancer

Don’t Miss the 35th Annual Dental Forum in Hawaii!
Maui January 31-February 7 &/or Kauai February 7-14

For details & registration, visit www.dentsem.com or call 952.922.1707
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Light Curing Guidelines for Practitioners

A Consensus Statement from the 2014 Symposium on Light Curing in Dentistry

Dalhousie University, Halifax, Canada
When properly performed, light curing of resin-based restorations produces better physical and chemical properties of the restoration, stronger bonds between the restoration and tooth, improved colour stability and a higher probability of a successful long-term clinical outcome. Light curing performed incorrectly can result in premature failure of the restoration and potentially more tooth decay, resulting in larger restorations that may require endodontic treatment, or other costly procedures. Undercuring resin-based fillings—by curing for an insufficient length of time, improperly positioning the light curing unit (LCU) over the restoration, or using the wrong type of LCU—is thought to contribute to the higher failure of resin-based restorations placed in general dental offices compared to the results from controlled clinical trials.

To discuss and address these concerns, an international symposium on light curing in dentistry was held at Dalhousie University in Halifax on May 29–30, 2014. The symposium was attended by 40 key opinion leaders from academia and industry who worked together to develop a Consensus Statement with advice on light curing for practitioners.


The support of Benco, BISCO, BlueLight Analytics, DENTSPLY, 3M-ESPE, Gigahertz-Optik, Henry Schein, Heraeus-Kulzer, Ivoclar Vivadent, Kerr, Patterson Dental, SDI, and Ultradent is gratefully acknowledged.

### Additional Resources on Oasis Discussions

- **BUYER BEWARE! NOT ALL CURING LIGHTS ARE EQUAL**
  oasisdiscussions.ca/2014/07/28/lc-3

- **AN ENLIGHTENING LOOK AT LIGHT SOURCES IN DENTISTRY**
  oasisdiscussions.ca/2014/07/17/cl-2

- **PRACTICAL HOW TO: HOW DO YOU CLEAN YOUR LIGHT CURING UNIT?**
  oasisdiscussions.ca/2014/07/03/htcl

- **EFFECTIVE USE OF DENTAL CURING LIGHTS: A GUIDE FOR THE DENTAL PRACTITIONER**
  oasisdiscussions.ca/2013/11/29/dcl

- Further resources on light curing will be posted on Oasis Discussions.
Light Curing Guidelines for Practitioners

A Consensus Statement from the 2014 Symposium on Light Curing in Dentistry, Dalhousie University, Halifax, Canada*

When selecting a light curing unit (LCU):

• Recognize that all lights are not created equal. Use a LCU from a manufacturer who provides contact information, a user manual, and service. Preferably the LCU should have received a favourable report or certification from a reputable independent 3rd party.

• Know the key performance parameters of your LCU, when new: (i) the light output (averaged irradiance over the beam incident area in mW/cm² and spectral output from the LCU), (ii) whether the beam has a uniform and effective output (profile) across the light tip, and (iii) the diameter of the light beam.

• Be cautious when using high (above 1,500 to 2,000 mW/cm²) output LCUs that advocate very short (e.g., 1 to 5 seconds) exposure times. When used for such short times, it is critical that the light tip is stabilized over the resin during exposure. Although some resin composites are matched to specific high output curing lights, high output LCUs may not adequately cure all of today’s resin-composites to the anticipated depth when used for short exposure times. Seek peer-reviewed literature validating the efficacy and safety of such lights and materials.

• When selecting a light curing unit (LCU):

Before you light cure, remember to:

• Regularly monitor and record the light output over time, with the same measurement device and light guide. Repair or replace the LCU when it no longer meets the manufacturer’s specifications.

• Inspect and clean the LCU before use to ensure it is on the correct setting, in good working order, and free of defects and debris.

• Consider that every resin-based material has a minimum amount of energy that must be provided at the correct wavelengths to achieve satisfactory results. [Energy (Joules/cm²) = output (W/cm²) x exposure time (seconds)]. However, minimum irradiation times are also required.

• Follow the light exposure times and increment thickness recommended by the resin manufacturer, making allowances if you use another manufacturer’s light. Increase your curing times for increased distances and darker or opaque shades.

• Select a LCU tip that delivers a uniform light output across the light tip and that covers as much of the restoration as possible. Cure each surface independently, using overlapping exposures if the light tip is smaller than the restoration.

• Position the light tip as close as possible (without touching) and parallel to the surface of the resin composite being cured.

• Stabilize and maintain the tip of the LCU over the resin composite throughout the exposure. Always use the appropriate “blue blocking” glasses or a shield to protect your eyes as you watch and control the position of the curing light.

Precautions:

• Avoid conditions that will reduce light delivery to the resin-composite, e.g.:
  – Holding the light tip several millimetres away.
  – Holding the light tip at an angle to the resin surface.
  – Dirty or damaged light-guide optics.

• Supplementary light exposures should be considered under circumstances that may limit ideal light access, such as shadows from matrix bands, intervening tooth structure, or from restorative material.

• Beware of potential thermal damage to the pulp and soft tissues when delivering high energy exposures or long exposure times.

• Air-cool the tooth when exposing for longer times, or when using high output LCUs.

• Never shine the LCU into the eyes, and avoid looking at the reflected light, except through an appropriate ‘blue-blocking’ filter.

• Testing surface hardness of the resin-composite in the tooth using a dental explorer provides NO information about adequacy of curing depth.

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HELPING LAC-MÉGANTIC RECOVER FROM DISASTER

O
n the eve of the first anniversary of the Lac-
Mégantic tragedy, the Journées dentaires interna-
tionales du Québec (JDIQ), with the help of the
provincial forensic sciences and pathology labora-
tory (LSJML), raised $20,000 to help the stricken community.

The LSJML came to the assistance of the coroner’s office
immediately following the train derailment that killed 47
people in Lac-Mégantic. “Our experts played a key role in
reconstructing the scene of the disaster and identifying the
victims,” says Dr. Sylvain Desranleau, a specialist in forensic
odontontology. “Among other things, we were responsible for
comparing the dental radiographs of missing persons with
those taken from human remains found in the rubble.”

Time passed, but the tragedy remained on Dr. Desranleau’s
mind. A few weeks after the derailment, he asked himself
what more he could do for the devastated community. “I felt
a personal connection; I wanted to do something to help the
victims recover,” he recalls. That’s where the idea came from to
hold a fundraising conference to explain the work performed
by the LSJML.

“I discussed the project with my dentist colleagues, and they
were all very enthusiastic about becoming involved once
again,” said Dr. Desranleau. Armed with this support, he met
with Dr. Denis Forest, JDIQ director, to present his idea of the
fundraiser. “Our discussion was very positive, and the Order of

“Everything changed for the citizens of Lac-Mégantic, Quebec, on July 6.
In the early morning hours, a train from
the Montreal, Maine & Atlantic Railway
Corporation derailed in the middle of downtown,
causing a convoy of tank cars full of crude oil to
explode. The resulting fire destroyed the very heart
of the small municipality, and killed 47 people.”


I felt a personal connection; I wanted to
do something to help the victims recover.

– Dr. Sylvain Desranleau
Dentists of Quebec was a valuable ally in promoting this event.” The project began to take shape. The funds raised would be donated to the Red Cross and earmarked for a program to help the victims of the tragedy.

Dr. Robert Dorion, a certified forensic odontologist, approached and recruited several LSJML experts to participate in the event. A meeting was then held with Pascal Mireault, LSJML director of forensic medicine and toxicology, and Yves “Bob” Dufour, LSJML director general, to discuss the organization of the conference. Among other things, they considered the legal implications of holding an event of this type.

The one-day conference was held on May 24, 2014, within the context of the JDIQ, and was an unqualified success. Dr. Desranleau is particularly grateful for the support and generosity shown by his colleagues: “I am very proud of the work accomplished by all those who contributed to this conference, especially the LSJML team, which—once again—devoted itself wholeheartedly to the cause of Lac-Mégantic.”

In all, 94 people signed up for the fundraising conference, enabling the organizers to raise $20,000. “I would be remiss if I did not thank the dentists and other professionals who attended the conference. Without them, we would not be in a position to support the community of Lac-Mégantic,” concludes Dr. Desranleau.

Lac-Mégantic Conference: Organizers and Participants
- Yves “Bob” Dufour (Session Chair)
- Pascal Mireault (Consultant)
Forensic odontologists
- Sylvain Desranleau
- Robert B. J. Dorion
- Sylvain Laforte
- André Ruest
Forensic pathologists
- Jean-Luc Laporte
- Caroline Tanguay
Forensic anthropologist
- Renée C. Kosalka
Specialists in forensic biology
- Josée Houde
- Sonia Roy

Dr. Renée C. Kosalka (shown above) discussed the role she played in reconstructing the scene at Lac-Mégantic.
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Dr. Werner Weisshaar,
The Avenue Dental Centre
To curb the growing epidemic of diabetes in the United States, the National Diabetes Education Program (NDEP) has taken the initiative of rallying pharmacy, podiatry, optometry and dentistry (PPOD) professionals. The NDEP was established in 1997 to promote early diagnosis of diabetes, improve management and outcomes, and prevent—or at least delay—the development of type 2 diabetes.

The initiative relies on a team approach to engage key health care providers and reinforce consistent diabetes messages across the four PPOD disciplines. “PPOD providers are often a primary point of contact for people with, or at risk of, type 2 diabetes,” the NDEP website explains. As such, those practitioners are well positioned to educate patients on diabetes control and prevention, discuss self-management, and refer to other health professionals to ensure appropriate care.

To help PPOD professionals in this endeavour, the NDEP has developed a comprehensive toolkit, called Working Together to Manage Diabetes, which includes:

- A guide with communication tips, information specific to each PPOD area, and information on other resources and related organizations;
- Presentation slides to help implement the PPOD approach;
- Fact sheets that health care providers can use to educate patients; and
- An education sheet and checklist document to help patients control their diabetes and for health care providers to communicate efficiently among themselves.

With an estimated 3.3 million Canadians suffering from diabetes and an additional 5.7 million showing signs of prediabetes,1 dentists can look outside the mouth to reinforce key messages and offer optimal care to their patients.

The NDEP is sponsored by the Centers for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH) and involves over 200 federal, state, and private sector agency partners.
Dr. Martin Gillis of Liverpool, Nova Scotia, registrar for the Provincial Dental Board of Nova Scotia and a past member of the consultative section on diabetes education at the International Diabetes Federation (IDF), served as chair of the PPOD update task group. “With this initiative, the NDEP wants to encourage health care providers to form local networks,” he says. “I think there’s an opportunity to do this in Canada, for actions to take place at the national and local levels. Through a concerted approach, we can not only ensure that our patients’ oral health care needs are met but also support our PPOD colleagues by encouraging foot care, eye care and medication reconciliation.”

Dr. Gillis emphasizes the importance of giving people the knowledge and tools they need to become active players in their own health management. “Health behaviour is an important aspect to focus on when meeting with patients.” Dentists can help their patients form and maintain healthy habits through motivational interviewing. “Discuss risk factors with them,” suggests Dr. Gillis. “Poor nutrition is a risk factor for obesity, type 2 diabetes and tooth decay. Help your patients understand those connections and help them identify reasonable changes they can implement in their day-to-day life.”

“General positive health behaviours and habits can translate into positive health behaviours in more complex scenarios like diabetes self-management. Building self-efficacy is key,” says Dr. Gillis.

**Reference**

**Figure:** In 2010, 2.7 million (7.6%) Canadians had diabetes and it is estimated that this number will grow by 1.5 million over this decade to 4.2 million (10.8%) by 2020.


---

**At the international level**

The IDF is an umbrella organization of over 230 national diabetes associations in 170 countries and territories. The FDI World Dental Federation and IDF first met in 2007 to discuss how they could cooperate to ensure quality oral care for those with diabetes. “We looked at some projects,” Dr. Gillis explains, “one of which was the creation of an oral health guideline for people with diabetes.” Dr. Gillis represented the IDF on the task force that lead to the release in 2009 of the **IDF oral health guideline**, which offers evidence-based recommendations for diabetes care providers on oral health care. Guideline available at: [idf.org/guidelines/diabetes-and-oral-health/guideline](http://idf.org/guidelines/diabetes-and-oral-health/guideline)

**Martin Gillis**

Poor nutrition is a risk factor for obesity, type 2 diabetes and tooth decay. Help your patients understand those connections and help them identify reasonable changes they can implement in their day-to-day life.
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CORPORATE INTERESTS VERSUS PATIENTS’ INTERESTS

There has been considerable discussion around ‘corporatization’ and the potential impact it will have on the profession in BC. But exactly what are we talking about and is it all bad? This is a worthwhile discussion but requires clarity around the issue to better understand both the pros and cons in order to see the forest for the trees.

F irst, the term ‘corporatization’ is too broad to be an accurate descriptor as most, if not all, practising dentists are incorporated. Rather the issue lies with ownership and/or financing arrangements that directly control or influence a dentist’s ability to meet their patients’ needs. In this case, the dentist’s ethical responsibility to the patient is superseded by the interests of the corporation.

Group practices and satellite practices have existed for years. These dentists have benefited from economies of scale through sharing of fixed costs among a larger number of dentists. The most common are clinics where several dentists operate their own practices with their own patients, or alternatively, associates working for a principal within a practice.

The concern arises when a business arrangement places the interest of the business entity over that of the patient. How would this look? The treating dentist’s ability to provide care is compromised by restrictions or limits placed by the corporation, such as:

- Corporate staff are responsible for billing, rather than the dentist;
- Aggressive production/patient quotas are placed on the dentist with financial penalties if they are not met;
- Finance arrangements where a corporate interest takes a share of the practice’s net income and has influence over the management of the practice.

Corporate ownership of dental offices is common in the US which provides Canadian dentistry the opportunity to learn what is good or bad. Many articles cite the positive benefits in terms of releasing the dentist from administrative burdens, decreasing the cost of practice, improving continuing education options, expanding emergency coverage and lowering advertising costs. It is when the agreement strays into the area of treatment that the switch to bad comes into play.

Good corporatization

Good corporatization exists where the relationship between the dentist and the patient is preserved with no external influences or restrictions linked to treatment.

Jocelyn Johnston

Jocelyn Johnston is executive director of the British Columbia Dental Association.

Good corporatization exists where the relationship between the dentist and the patient is preserved with no external influences or restrictions linked to treatment.
arrangement. It could also be a management contract in which services are provided based on fees that are not linked to treatment and/or production. In all cases, the clinical dentist providing treatment should always have unfettered decision-making authority.

Bad corporatization

Bad corporatization has been investigated by no less than the US Senate. Its recent investigation into the impact of “corporate-backed” dentistry on Medicare billings exposed how things can go terribly wrong. In its 2013 report on this issue it found that under the guise of a management services contract, dental corporations were eluding state regulations whereby only a dentist can own a dental practice. As well, it outlined the corporate policies that placed profit over patient care including overtreatment of children. The report is a sobering review of what can go wrong when professional ethics are subservient to the best interests of the corporate entity.

Could this happen in BC?

The College of Dental Surgeons of BC’s Code of Ethics and bylaws are clear on a dentist’s professional obligations with respect to patient care. Further, the Health Professions Act, Section 43.1 (c) states that only a registrant of the College can legally own voting shares of the corporation while family members can hold non-voting shares.

Management arrangements also exist, the most basic being a principal/associate arrangement. Any arrangement that seriously affects a dentist’s ability to meet their professional responsibilities to a patient is a concern. Recently, the College addressed limits placed on associates that it deems unacceptable in its 2013 complaint summary, noting that:

“Particular problems arose in practices where associate dentists (dentists who work in the practice as employees) had no involvement in fee discussions with patients. In some cases, the associate dentists said they were instructed not to discuss such matters with their patients. This is not appropriate: associate dentists must have autonomy to develop the treatment plan solely on the basis of the patient’s oral health needs. Associate dentists have an obligation to obtain the patient’s informed consent, which includes an understanding of all options and their associated costs.”

While the College has a role in setting the standards for the profession, the real onus rests on individual dentists to act ethically, irrespective of whether one is, or isn’t, ‘caught’. This is even more important as new corporate structures evolve over time.

Bad corporations cannot establish themselves if individual dentists are aware of the potential risks to their practice as well as their ethical responsibilities and ensure that they are able to practise dentistry unencumbered by undue restrictions on their practice. This is both your right as a professional and your obligation.

The opinions and/or perspectives raised in this article are not an official position of the BCDA.

References


A version of this article originally appeared in the July 2014 edition of the bridge — the member publication of the BCDA. CDA thanks the BCDA for granting permission to re-publish this article.

CDA would like to include a number of articles in CDA Essentials and posts on Oasis Discussions about this broad topic. We want to provide unbiased, solid advice to Canadian dentists about corporatization, group practices and investor-owned practices.

– Have you had any experience working as part of these groups?
– Have you been approached by an organization to purchase your practice?
– Are you a young dentist who has started working in one of these group practices?

We would like to hear from you and learn of your experiences. We also welcome any questions you may have about such arrangements.

Contact us at oasisdiscussions@cda-adc.ca or 1-855-716-2747. We promise you confidentiality.
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Dr. Richard Thain of Embrun, Ontario pocketed $262 in auto insurance savings!
Cone Beam Computed Tomography

HOW CAN CBCT ENHANCE PATIENT CARE?

Since its initial application as a convenient and less expensive alternative to medical computed tomography (CT) for osseointegrated implants, the uses for cone beam computed tomography (CBCT) technology in dentistry have grown. CDA spoke with Dr. David MacDonald, fellow of the Royal College of Dentists of Canada and chair in oral and maxillofacial radiology at the University of British Columbia, to get his perspectives on the benefits and risks associated with CBCT.

How is CBCT used in dental offices?
If you are involved in implants, then CBCT is very relevant to your practice. CBCT’s superior spatial resolution in three dimensions also makes it useful in diagnosis and treatment planning for endodontics, complex unerupted teeth, and examination of potentially serious lesions, such as benign neoplasms affecting the anatomically complex maxilla. To understand how CBCT can enhance your patient care, you need to know its clinical indications to ensure you avoid unnecessary exposure.

What are the benefits of using CBCT for implants?
There are skilled surgeons and implantologists with tremendous experience who can safely place implants without CBCT, at least for some of their patients. But if you lack that skill or experience, the safest option for you and your patient is to use CBCT as part of your pre-implant planning.

Without CBCT, there is an increased risk of inadvertently placing the implant into the mandibular canal, submandibular fossa or maxillary sinus, and also the canals running to the lingual foramen at the midline, where the branches from the lingual artery are found. A sublingual hemorrhage is potentially life-threatening, as documented in 2 dozen reports so far.

How does the radiation risk associated with CBCT compare to other types of dental imaging?
It goes without saying that every radiographic exposure should have at least one clear clinical indication. CBCT imparts a significantly greater radiation dose to the patient’s head than conventional radiography—and more than just 1 or 2 panoramic radiographs, more like at least 10. Because there is no safe radiation dose and the effects of radiation are cumulative, dentists need to continue to observe ALARA (As Low as Reasonably Achievable)—particularly for children, our most vulnerable patients. At UBC Dentistry, we infrequently use CBCT on children.

Also, CBCT has an initial steep learning curve—and with this, an increased likelihood of retakes. Therefore, the dental team must ensure its technical competence by prior practice with appropriate phantoms before exposing the patient. Given the potential risks associated with repeated scans, practitioners will need to weigh the benefits to justify each decision to scan.

What impact will regulatory and other dental professional bodies have on CBCT use?
The reduction in risk of radiation-induced harm is a major interest of our regulatory bodies. In 2011, the Royal College of Dental Surgeons of Ontario produced regulations on CBCT. The regulations stipulate that dentists who are not credentialed oral and maxillofacial specialists must take a course on CBCT before operating a CBCT unit, and can use a field of view of 8 cm or less, confined to the jaws. This excludes the temporomandibular joints.

The European guidelines, originally named SEDENTEXCT, were published in May 2012. These guidelines have been adopted by the British Columbia Dental Association as the basis of its CBCT courses for its members.
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Jeff Brucia - Materials/Techniques
Bethany Valachi - Ergonomics
Scott Benjamin - Lasers
Lee Ann Brady - Restorative
Jim Grisdale - Periodontics
Carla Cohn - Pediatrics
Diane Millar - Hygiene
Elliot Mechanic - Aesthetics
Michael R. Norton - Implants
Cliff Ruddle - Endodontics
Samson Ng - Oral Medicine/Pathology
Rick Cardoza - Forensics

Check our website for the complete speaker roster
How to Manage a Patient with Peri-implantitis

Peri-implantitis
Infectious disease that causes an inflammatory process in the soft and hard tissues surrounding an osseointegrated implant, leading to the loss of supporting bone.

Presentation

Population
Patients with implants

Risk Factors
- Tobacco use
- Poorly controlled systemic conditions (e.g., diabetes mellitus, osteoporosis, post-irradiated jaws)
- History of periodontitis and noncompliance to treatment
- Poor oral hygiene
- Parafunctional habits (e.g., bruxism)
- Iatrogenic factors (e.g., lack of primary stability and premature loading during the healing period)

Signs
- Progressive increase in probing depth
- Suppurations and exudation from peri-implant space
- Bleeding on probing
- Clinical appearance of inflamed tissue (bleeding, swelling, colour change, suppuration, and plaque/calculus accumulation)
- Progressive loss of supporting bone on follow-up radiographs (see Figs. 1 and 2): loss of supporting bone beyond 0.2 mm annually, after the expected physiologic remodelling.

Symptoms
- Not always symptomatic
- Pain severity: typically none
- May have dull aches, tenderness on brushing or palpation
- Bad taste: potentially noticeable if there are purulent exudates
- Increasing mobility (in cases of a failed implant)
- Lymphadenopathy

Dental Emergency Scenario
This article was originally created for the JCDA Oasis searchable database. Visit Oasis Help at jcdaoasis.ca to access this and other point of care clinical consults.
etiology of the problem, a specific treatment is selected. Appropriate management of peri-implantitis often requires referral to a periodontist.

**Etiology: Bacterial Infection**

- Control the acute bacterial infection and reduce the inflammation in the tissues through:
  - Mechanical debridement
  - Localized and/or systemic antimicrobial therapy
  - Improved patient compliance with oral hygiene until a healthy peri-implant site is established
- At the re-evaluation, if the patient does not have a satisfactory response to the nonsurgical therapy, surgery should be considered. Assess the presence of retained cement and its subsequent removal (Figs. 3 and 4). It is important to assess for possible cement entrapment, as new data shows an increasing number of failures from this etiology.
  - Detoxify the implant surface by using mechanical devices (e.g., high pressure air powder abrasive, laser decontamination) and/or by applying chemotherapeutic agents (e.g., supersaturated citric acid or tetracycline applied with cotton pellets or a brush).
  - Perform flap management with either (or both) resective and regenerative approaches, depending on the morphology and size of the bone destruction.
  - Systemic antibiotics are suggested postoperatively.

**Etiology: Biomechanical Forces**

- Perform:
  - An analysis of the fit of the prosthesis
  - A verification of the number and position of the implants
  - An occlusal evaluation

Prostheses design changes, replacing defective restorative components, and correcting occlusal overload (through improve-
ment of implant number and position, occlusal equilibration, and occlusal splint for patients with parafunction) can arrest the progression of peri-implant tissue breakdown.

- Perform the surgical procedure, if necessary.
  - Detoxify the implant surface by using mechanical devices (e.g., high pressure air powder abrasive, laser decontamination) and/or by applying chemotherapeutic agents (e.g., supersaturated citric acid or tetracycline applied with cotton pellets or a brush)
  - Perform flap management with either or both resective and regenerative approaches, depending on the morphology and size of the bone destruction.
  - Systemic antibiotics are suggested postoperatively.

Etiologies Acting as Co-Factors

Other etiologic factors may act as co-factors in the development of peri-implantitis. Nonetheless, treatment still consists of removing the bacterial infection or correcting the biomechanical forces.

Possible Co-Factors

- Anatomical limitations: inadequate amount of bone in recipient site at the time of the implant placement
- Surgical trauma: overheating of bone during implant placement
- Compromised host response

Addressing Potential Risk Factors

- Treatment of active periodontal disease and improvement of oral hygiene
- Counseling the patient on tobacco cessation

Notes

- There is no consensus regarding the best regenerative material and no long-term data regarding success of regenerative treatment.
- It is important for patients to understand that regenerations are neither predictable nor reliable on an integrated and restored implant. Patients must be involved in the decision to save or replace the implant.
- Many techniques for implant surface detoxification have been used but there is not yet a defined standard protocol.

Treatment of Failed Implants

In the presence of extensive bone loss or implant mobility, the implant may be removed and alternative options to replace the missing tooth should be discussed (replacement of failed implant, fixed partial denture, removable partial denture, etc.).

Suggested Resources

Orders and Enquiries to:  
John Reid, ext. 23  
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c/o Keith Communications Inc.,  
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ALBERTA - Red Deer: Wishing to hire an associate for a long-term relationship leading to a buy-in opportunity. Well-established family practice in Red Deer offers some unique mentoring possibilities in progressive dental care. See what our team can offer you by replying to: kerri@52streetdental.ca. D18376

BRITISH COLUMBIA - Burns Lake: Full-time/Part time associate needed immediately for established, busy family practice with high income potential. The clinic provides full-time assistants, hygienists, high-tech equipment, Cerec and friendly, hard working staff. Location provides some of the most exquisite outdoor recreation areas in BC. Contact David at: (435) 767-8375 or email: drdwy45@gmail.com. D18807

MANITOBA - Thompson: Full-time, energetic, detail-oriented associate needed immediately for established, busy family practice with income potential up to $30,000 per month. Enjoy a fully booked schedule and ability to reach your goals as a dental professional. Experience preferred. Excellent opportunity. New grads welcome. Living and travel accommodations provided. Email CV to: thompsondent@gmail.com fax: (204) 677-4072, ph.: (204) 939-0083. D9971

ONTARIO - 26 Locations: Experienced Associate required for our well-established, busy practices. Enjoy a small town or a large city atmosphere. For more information visit our website at www.altima.ca or email us at dentist@altima.ca. D9513

ONTARIO - Kenora: Full-time associate required for enjoyable three-dentist practice. No evenings or weekends. Accommodation available. Earn 40 - 45% with buy-in potential. Kenora is cottage country 2 hours from Winnipeg. Email: kenoradent@hotmail.com. D18548


ONTARIO - Muskoka: Are you professionally fulfilled? Are you practicing dentistry in fertile soil and at the level you desire? Fantastic career and lifestyle opportunity! Don’t hope any longer. Come share your passion and enthusiasm for dentistry with a connected, like-minded, highly-trained team! We are looking for an associate who enjoys people and loves dentistry. Our thriving, modern, high-tech family practice requires a GP who is confident with professional goals while enjoying a lifestyle desired by many. If you are growth-minded come and interview us and help us move to the next level. Future buy-in opportunity. Please leave a detailed message about yourself, your experience and your desires. Phone: (705) 789-6070. D18521

ONTARIO - Ottawa Valley: Immediate position available for our very busy and well-established office. Our current associate is relocating, we have a full patient schedule available. Please email resume to: dentalvisiondental@outlook.com. D18457

ONTARIO - Rockland: 20 minutes east of Ottawa. Very busy recently expanded dental clinic seeking dentist for long term, full-time position. Multidisciplinary practice with the latest high tech equipment (2D & 3D x-ray). Mentoring available. Above average remuneration. Tel: (613) 446-3368 Fax: (613) 446-5006 Email: laurierdental@videotron.ca. www.laurierdentalclinic.ca. D18529

PRINCE EDWARD ISLAND: Associate position available in a busy rural family practice. Seeking a quality dentist who is compassionate and enjoys working in a team environment. Enjoy a full schedule while working in a newly-constructed, bright and spacious clinic of 6 operatories with 2 full-time hygienists. Perfect opportunity for a new grad or a seasoned practitioner. To inquire, please contact: dr.r.ramsay@gmail.com. D9885

FOR SALE: G7881W dental disinfector. Brand new, never used. Asking $10,000. Contact Paula Hewlin at: (780) 743-4111 or: office@maxxdental.com. D18289

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CDSPI Funds Performance

Period ending September 30, 2014

CDSPI Funds can be used in your Canadian Dentists’ Investment Program RSP, TFSA, RIF, Investment Account, RESP and IPP.

### Canadian Growth Funds

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>MER</th>
<th>1 YEAR</th>
<th>3 YEARS</th>
<th>5 YEARS</th>
<th>10 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive Equity Fund (Fiera Capital)</td>
<td>1.00%</td>
<td>29.5%</td>
<td>20.1%</td>
<td>13.8%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Canadian Equity Fund (Trimark)</td>
<td>1.50%</td>
<td>13.0%</td>
<td>15.5%</td>
<td>9.4%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Common Stock Fund (Fiera Capital)</td>
<td>0.99%</td>
<td>20.4%</td>
<td>10.4%</td>
<td>6.0%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Dividend Fund (PH&amp;N)</td>
<td>1.20%</td>
<td>18.4%</td>
<td>13.9%</td>
<td>9.6%</td>
<td>6.7%</td>
</tr>
<tr>
<td>High Income Fund (Fiera Capital)</td>
<td>1.45%</td>
<td>17.8%</td>
<td>14.4%</td>
<td>11.8%</td>
<td>n/a</td>
</tr>
<tr>
<td>TSX Composite Index Fund (BlackRock®)††</td>
<td>0.67%</td>
<td>19.5%</td>
<td>11.2%</td>
<td>7.8%</td>
<td>7.8%</td>
</tr>
</tbody>
</table>

### International Growth Funds

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>MER</th>
<th>1 YEAR</th>
<th>3 YEARS</th>
<th>5 YEARS</th>
<th>10 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerging Markets Fund (Brandes)</td>
<td>1.77%</td>
<td>16.9%</td>
<td>12.1%</td>
<td>6.3%</td>
<td>9.1%</td>
</tr>
<tr>
<td>European Fund (Trimark)†</td>
<td>1.45%</td>
<td>10.9%</td>
<td>19.5%</td>
<td>12.5%</td>
<td>6.3%</td>
</tr>
<tr>
<td>Global Fund (Trimark)</td>
<td>1.50%</td>
<td>18.0%</td>
<td>17.4%</td>
<td>11.5%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Global Growth Fund (Capital Intl)†</td>
<td>1.77%</td>
<td>18.7%</td>
<td>19.7%</td>
<td>11.9%</td>
<td>7.3%</td>
</tr>
<tr>
<td>Global Real Estate Fund (Invesco)†</td>
<td>1.75%</td>
<td>14.0%</td>
<td>16.7%</td>
<td>10.1%</td>
<td>n/a</td>
</tr>
<tr>
<td>International Equity Fund (CC&amp;L)</td>
<td>1.30%</td>
<td>10.3%</td>
<td>16.3%</td>
<td>7.8%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Pacific Basin Fund (CI)</td>
<td>1.77%</td>
<td>12.0%</td>
<td>10.0%</td>
<td>4.8%</td>
<td>4.1%</td>
</tr>
<tr>
<td>S&amp;P 500 Index Fund (BlackRock®)††</td>
<td>0.67%</td>
<td>28.7%</td>
<td>24.5%</td>
<td>15.4%</td>
<td>5.6%</td>
</tr>
<tr>
<td>US Large Cap Fund (Capital Intl)†</td>
<td>1.46%</td>
<td>27.3%</td>
<td>21.9%</td>
<td>12.8%</td>
<td>n/a</td>
</tr>
<tr>
<td>US Small Cap Fund (Trimark)</td>
<td>1.25%</td>
<td>18.4%</td>
<td>21.6%</td>
<td>18.4%</td>
<td>8.0%</td>
</tr>
</tbody>
</table>

### Income Funds

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>MER</th>
<th>1 YEAR</th>
<th>3 YEARS</th>
<th>5 YEARS</th>
<th>10 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond and Mortgage Fund (Fiera Capital)</td>
<td>0.99%</td>
<td>1.8%</td>
<td>1.2%</td>
<td>1.8%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Bond Fund (PH&amp;N)†</td>
<td>0.65%</td>
<td>6.0%</td>
<td>3.2%</td>
<td>4.4%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Fixed Income Fund (MFS)†</td>
<td>0.97%</td>
<td>6.0%</td>
<td>2.8%</td>
<td>3.9%</td>
<td>4.4%</td>
</tr>
</tbody>
</table>

### Cash and Equivalent Fund

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>MER</th>
<th>1 YEAR</th>
<th>3 YEARS</th>
<th>5 YEARS</th>
<th>10 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Market Fund (Fiera Capital)</td>
<td>0.67%</td>
<td>0.4%</td>
<td>0.5%</td>
<td>0.3%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

### Growth and Income Funds

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>MER</th>
<th>1 YEAR</th>
<th>3 YEARS</th>
<th>5 YEARS</th>
<th>10 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balanced Fund (PH&amp;N)</td>
<td>1.20%</td>
<td>15.1%</td>
<td>10.7%</td>
<td>6.8%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Balanced Value Fund (MFS)†</td>
<td>0.95%</td>
<td>14.8%</td>
<td>12.1%</td>
<td>7.5%</td>
<td>5.7%</td>
</tr>
</tbody>
</table>

### Corporate Class Funds

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>MER</th>
<th>1 YEAR</th>
<th>3 YEARS</th>
<th>5 YEARS</th>
<th>10 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canadian Bond Fund Corporate Class (CI)†</td>
<td>1.10%</td>
<td>5.8%</td>
<td>3.0%</td>
<td>4.2%</td>
<td>n/a</td>
</tr>
<tr>
<td>Canadian Equity Fund Corporate Class (CI)†</td>
<td>1.65%</td>
<td>19.9%</td>
<td>15.4%</td>
<td>9.1%</td>
<td>n/a</td>
</tr>
<tr>
<td>Corporate Bond Fund Corporate Class (CI)†</td>
<td>1.25%</td>
<td>8.1%</td>
<td>8.1%</td>
<td>7.4%</td>
<td>n/a</td>
</tr>
<tr>
<td>Income and Growth Fund Corporate Class (CI)†</td>
<td>1.45%</td>
<td>15.1%</td>
<td>12.8%</td>
<td>9.0%</td>
<td>n/a</td>
</tr>
<tr>
<td>Short-Term Fund Corporate Class (CI)†</td>
<td>0.75%</td>
<td>0.6%</td>
<td>0.7%</td>
<td>0.6%</td>
<td>n/a</td>
</tr>
</tbody>
</table>

### Managed Risk Portfolios (WRAP Funds)

#### Index Fund Portfolios

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>MER</th>
<th>1 YEAR</th>
<th>3 YEARS</th>
<th>5 YEARS</th>
<th>10 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive Index Portfolio (BlackRock®)†</td>
<td>0.85%</td>
<td>16.6%</td>
<td>12.7%</td>
<td>8.4%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Conservative Index Portfolio (BlackRock®)†</td>
<td>0.85%</td>
<td>11.2%</td>
<td>7.6%</td>
<td>6.6%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Moderate Index Portfolio (BlackRock®)†</td>
<td>0.85%</td>
<td>13.9%</td>
<td>10.1%</td>
<td>7.5%</td>
<td>6.0%</td>
</tr>
</tbody>
</table>

#### Income/Equity Fund Portfolios

<table>
<thead>
<tr>
<th>Fund Name</th>
<th>MER</th>
<th>1 YEAR</th>
<th>3 YEARS</th>
<th>5 YEARS</th>
<th>10 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive Growth Portfolio (CI)†</td>
<td>1.65%</td>
<td>16.6%</td>
<td>16.8%</td>
<td>9.8%</td>
<td>6.3%</td>
</tr>
<tr>
<td>Balanced Portfolio (CI)†</td>
<td>1.65%</td>
<td>13.0%</td>
<td>12.1%</td>
<td>8.3%</td>
<td>6.6%</td>
</tr>
<tr>
<td>Conservative Growth Portfolio (CI)†</td>
<td>1.65%</td>
<td>13.9%</td>
<td>13.3%</td>
<td>8.8%</td>
<td>6.3%</td>
</tr>
<tr>
<td>Income Portfolio (CI)†</td>
<td>1.65%</td>
<td>9.8%</td>
<td>8.0%</td>
<td>7.4%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Income Plus Portfolio (CI)†</td>
<td>1.65%</td>
<td>11.3%</td>
<td>9.6%</td>
<td>7.5%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Moderate Growth Portfolio (CI)†</td>
<td>1.65%</td>
<td>14.8%</td>
<td>14.8%</td>
<td>9.3%</td>
<td>6.3%</td>
</tr>
</tbody>
</table>

Figures indicate annual compound rate of return. All fees have been deducted.
As a result, performance results may differ from those published by the fund managers.
Figures are historical rates based on past performance and are not necessarily indicative of future performance.
MERs are subject to applicable taxes. BlackRock is a registered trade-mark of BlackRock, Inc.
† Returns shown are for the underlying funds in which CDSPI funds invest.
†† Returns shown are the total net returns for the funds which track the indices.
To speak with a representative, call CDSPI toll-free at 1-800-561-9401.
For online fund data or more recent performance figures, visit www.cdspi.com/invest.
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