JCDA
Journal of the Canadian Dental Association

Vol. 70, No. 10 November 2004

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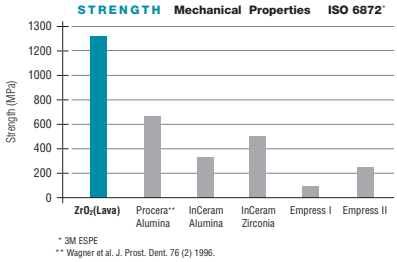

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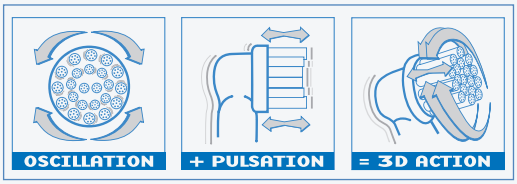

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1 Heanue et al. Manual versus powered toothbrushing for oral health (Cochrane Review). In: The Cochrane Library, Issue 1, 2003, Oxford: Update Software.
Full report online at www.update-software.com/toothbrush. BRAA32111

Editorial

PROFESSION AND INDUSTRY CAN SHARE INTERESTS

Dr. John P. O'Keefe

Have you ever wondered why the prices charged by some Canadian dental suppliers are lower than those charged by others? I did recently while reading a glossy flyer from a distributor I had never heard of. I then went online and compared the prices of materials advertised in the flyer with those listed by well-known suppliers.

The listed prices differed substantially between the big and small companies for many items. However, low prices do not always connote good value. Low overhead providers can actually produce poor value if they don't offer after-sales service or if low inventories lead to delays in delivery. I know that good value for money for dental supplies is important to readers because of the many phone calls I received this summer about the unsavoury business practices of one supply company.

Some of these calls were particularly provocative. One caller asked why there is a "large mark-up on dental supplies in Canada." Another asked me how he could find out if a particular supply house was a legitimate operator. Yet another caller expressed concern about the safety of some materials being distributed in Canada by dealers who may have low prices rather than quality as their primary business goal.

Looking closer at the dental supplies business, I found that outside of the legitimate channels, there are black and grey markets for these products. A black market exists when there are clearly illegal actions being perpetrated, such as a supplier passing off counterfeit or stolen materials as a legitimate offering. A grey market exists when legitimate goods made by bona fide manufacturers, destined for sale in a developing country, find their way onto the Canadian market at deeply discounted prices.

The grey market is particularly upsetting for manufacturers and their authorized dealers when they see these products coming into Canada advertised as bargains. The conditions for this grey market exist because manufacturers need to sell materials at considerably discounted prices to low-income countries, where the fees commanded by dentists are much lower than in Canada.

"Cherish the creativity generated by free enterprise" you might respond as you celebrate the savings to your overhead, courtesy of the grey market. Of course, the overall impact of those savings may be quite small if we assume that consumable supplies represent just 7% of office overhead.

You have no guarantee that grey market products have been transported and stored according to the manufacturer's instructions. If you have a problem with the materials, the manufacturer may not offer warranty protection (even though some grey market distributors claim they will assume this responsibility). There is also no guarantee that products destined for other countries have undergone the rigorous testing required of products for sale in Canada.

The probability of problems occurring with these materials may be small. However, we can minimize their occurrence by adhering to consistently high standards in all aspects of oral health care provision. It is hard for us to argue that high standards are required for the licensing of dentists in Canada, but that less than optimal standards are acceptable for the materials that we place in patients' mouths.

Wherever you choose to purchase your materials and devices, be sure to consult the Health Canada databases of legally registered manufacturers and distributors in Canada. You can also identify whether or not the products they sell meet the standards required by the Therapeutic Products Directorate of the regulatory agency. Links to these searchable databases are available at http://www.cda-adc.ca/jcda/vol-70/issue-10/659.html.

If there are matters of common concern that need to be discussed by the profession and industry (e.g., how to enhance access to dental care and to lobby for increased regulatory efficiency), perhaps now is the time to establish an ongoing dialogue between CDA and the Dental Industry Association of Canada. It is in the best interests of the people represented by both national organizations to ensure that the highest quality oral health care is available to all Canadians.

John O'Keefe
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1. Volpe AR, et al. J Clin Dent. 1996; 7 (suppl): S1-S14. 2. Data on file, Colgate-Palmolive Company. 3. Ayad f, et al. Clinical efficacy of a new tooth whitening dentifrice. J Clin Dent. 2002; 13:82-85. 4. Singh S, et al. The clinical efficacy of a new tooth whitening dentifrice formulation: A six-month study in adults. J Clin Dent. 2002; 13:86-90.
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President's Column

LOOKING BEYOND OUR BORDERS

Dr. Alfred Dean

It is always difficult to decide what programs and issues CDA should be involved in. One topic that provokes debate is CDA's involvement in the FDI World Dental Federation. With all the national-level issues and responsibilities CDA focuses on to meet our members' needs, it is difficult to remain compassionate about oral health issues in the international domain. Why is CDA actively involved in FDI? Well, let me try to explain.

I have just returned from the FDI World Dental Congress meetings in New Delhi, India. India is a beautiful country, yet what a land of contrasts. It has the most awe-inspiring cultural monuments, yet there is poverty everywhere. There are people talking on their cell phones, yet there are beggars on the street corners. India has a population of nearly 1 billion, yet monumental health care issues continue to affect its people.

Oral cancer is the second largest killer of men and women in the Indian subcontinent, and almost 1 million new cases are diagnosed each year. Despite these statistics, the use of chewing tobacco and other forms of smokeless tobacco is widespread. Smokers abound, including those who practise the dangerous act of "reverse smoking." This entails smoking with the hot end of the cigarette in your mouth. Tobacco use is deeply woven into the Indian cultural fabric, which makes bringing the message of tobacco control to countries like India a massive, but necessary, undertaking.

This is where FDI comes in. Working in conjunction with other international organizations, FDI's various committees and councils aim to improve the oral health of people around the world. For example, the World Health Organization (WHO) Framework Convention on Tobacco Control is an international agreement, where the signatory countries commit to working towards tobacco reduction. FDI is perfectly suited to spread this message to the undeveloped world through its Statements on Oral Health and its continuing education programs.

FDI also collaborated with WHO this year to organize the Planning Conference for Oral Health in the African Region, held in Nairobi, Kenya. This most successful event saw all African countries come together to discuss common oral health issues for the very first time. The resulting Nairobi Declaration was a landmark achievement, with its key principle being to increase access to basic dental care — something that is far from a reality for the majority of the world's population.

In a speech delivered to the American Dental Association in Orlando, former British prime minister John Major talked about the growing disparities between the developed and the undeveloped world. His treatise is that the developed world must be mindful of its obligation to help the undeveloped world reach its potential. According to Mr. Major, if this goal is not prioritized, the Western nations will bear the social and economic consequences.

FDI has 118 regular member associations and few have a greater ability to influence decision-making as much as Canada. Our opinion is very well received and considered. As an example, I was able to give a Canadian perspective to the FDI Oral Health Statement on lifelong learning in dentistry, which resulted in significant changes to the original document. Apart from the professional knowledge we offer, we also provide organizational expertise. The new FDI governance model was recently approved by FDI Council, due in large part to the hard work of Dr. Burton Conrod, a recent past-president of CDA.

Next August, Montreal will host the FDI World Dental Congress. There is incredible excitement and anticipation around the world in advance of these meetings. While it is dangerous to predict numbers, this Congress is shaping up to have the greatest attendance in the last several years, as we fully expect 20,000 people to come to Montreal for the event.

I would encourage you to make plans to attend the 2005 Congress. It will be a great opportunity to have a rewarding professional and educational experience, while tapping into the global network of dentistry. By attending the Congress, not only do you contribute to the advancement of your profession, you also help FDI deliver its message of optimal oral health to people worldwide.

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Alfred Dean, DDS
president@cda-adc.ca

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1. Harris M, Mackay H, *et al.*, Effectiveness of Johnson & Johnson REACH® Clean Burst™ vs. GLIDE® Mint Floss in Reducing Plaque, Journal of Dental Research, Vol. 82, Special Issue B, June 2003.
2. Harris M, Hardie-Muncy D, *et al.*, Effectiveness of Johnson & Johnson REACH® Clean Burst™ vs. Oral-B® SATIN FLOSS™ in Reducing Plaque, Data on file, Johnson & Johnson Inc., 2003.

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Letters

Editor's Comment

The *Journal* welcomes letters from readers about topics that are relevant to the dental profession. The views expressed are those of the author and do not necessarily reflect the opinions or official policies of the Canadian Dental Association. Letters should ideally be no longer than 300 words. If what you want to say can't fit into 300 words, please consider writing a piece for our Debate section.

QDSA's Withdrawal from CDA

Upon reading the *President's Column*[1] in the September issue of *JCDA*, I realize with regret that there is a persistent misunderstanding of the fundamental reasons for the withdrawal of the Quebec Dental Surgeons Association (QDSA) from the Canadian Dental Association (CDA). Therefore, I feel it is important to once again explain the real justification for the QDSA decision.

The representation of dentists by an association, in whatever forum it operates, must be based on an accurate understanding of their concerns and views on various subjects. An association whose mission is to represent its members must therefore make sure to use all of its resources to accurately reflect the views of its members. This is the source of the divergence between QDSA and CDA.

As we wrote in a letter to the CDA president in June 2003, our withdrawal results directly from the model of governance chosen by the CDA Board of Governors. This model dictates that directors, no matter what province they hail from, do not have the right to represent their home provincial association and must exclusively serve the greater interests of CDA.

In fact, the mission of the QDSA is precisely to defend and promote the economic, social and moral interests of its members. For that purpose, it has adopted structures that ensure that its members are adequately represented: a Board of Directors comprised of 25 dentists elected by dentists practising in the 13 regions, an executive bureau and numerous advisory committees. Moreover, QDSA executives regularly take part in the activities of the dental societies to which all Quebec dentists belong. Accordingly, QDSA rightfully claims to be the only organization to adequately represent Quebec dentists and it cannot grant CDA the same right to speak on behalf of Quebec dentists simply because it has appointed 1 or 2 Quebec dentists.

When 2 missions become contradictory, when a national or other type of association flouts a right that belongs to QDSA, we have no choice but to react. And that is what we did. That is the reason, the only reason, for our withdrawal.

In that same letter of June 2003, we assured CDA, as well as our colleagues in other provincial associations, of our willingness to continue to collaborate and participate in any group debate on national issues affecting our profession. We pointed out that our resources and commitment are entirely at their disposal so that we can share our skills to determine an appropriate course of action and thus guarantee Quebec and Canadian dentists a brighter and more prosperous future. We concluded by stating our hopes that QDSA and CDA would maintain a calm and constructive dialogue about future relations.

We matched these words with deeds, as QDSA, CDA and the Order of Dentists of Quebec are partners in the organization of the 2005 FDI World Dental Congress. This collaboration is proof of our commitment. It will enable us to give a fitting reception to our international guests and be a credit to our profession.

Dr. Chantal Charest
President
Quebec Dental Surgeons Association

Reference

1. Dean A. On travel and other thoughts. *J Can Dent Assoc* 2004; 70(8):509.

Who Should Represent Dentists?

I applaud Dr. Dean for his view of the value of provincial and national dental associations representing dentists.[1] Dr. Dean also states there is growing belief in some circles that regulatory bodies could somehow better represent the interests of dentists. I find this tendency alarming. Having witnessed and participated in the process of change that saw the re-establishment of a member services association in British Columbia, I can only hope that our experience will help prevent history repeating itself in other areas of the country.

A brief historical perspective of organized dentistry in B.C. should help illustrate Dr. Dean's point about the real and perceived conflict of interest that exists under a model with a dual mandate. Before 1970, there were 2 dental organizations in B.C., the original British Columbia Dental Association and the College of Dental Surgeons of B.C. The association provided membership services to dentists, while the college was responsible for licensure and discipline. Due to financial constraints faced by the voluntary association, the dentists were advised to wind up the operations of the association and incorporate member services into the college. At the time, this seemed a reasonable course of action, as the cost to fund the expanded college would be borne by every dentist through the licence fee. The college would wear 2 hats by

continuing to fulfill its regulatory function while representing the interests of dentists through its member services division.

In the ensuing years, however, many members became increasingly skeptical of the college's ability to carry out its dual function. Cases of colleagues seeking advice from the member services division about problems they may have had with patients were sometimes turned over to the regulatory division for disciplinary action, and this contributed to a growing "fear factor" amongst the membership. The trend toward diverting revenues from member services to cover ever-increasing regulatory costs caused further angst. The conclusion drawn by many was that the college's dual role of protecting the public and representing dentists was seen to be in conflict.

In 1991, the provincial government, through the Seaton Commission, recommended to the health professions that 2 separate bodies be created for all regulated professions, thus ensuring unequivocal separation of membership functions and licensing and discipline functions. In October 1998, the Association of Dental Surgeons of B.C. (renamed the British Columbia Dental Association as of October 2004) was formed, taking over all member services in the province. Further, the funding model used in B.C. is mandatory through the licence fee; like other provinces, one licence fee includes college dues, association dues and CDA dues. This funding model eliminates the necessity of costly membership drives and the possibility of dentists benefiting from services without paying for them. It also ensures representation of all dues-paying members.

One could argue that it is in the public's best interest that all dentists belong to their member association, as it permits access to services and programs such as continuing education and professional counselling. Furthermore, all paying dentists are represented by their association, unencumbered by regulatory bodies and, by extension, provincial governments. By all accounts the dentists of B.C. are pleased with the re-establishment of the provincial association and value its programs and services. A clear separation of membership functions from the regulatory role of the college has certainly provided comfort from the public's perspective as well. Merging the member functions of the association with the college ultimately failed in B.C. I would strongly caution against any similar initiative elsewhere in Canada.

Dr. Richard Busse
Past president
Association of Dental Surgeons of B.C.

Reference

1. Dean A. Who represents you? *J Can Dent Assoc* 2004; 70(7):437.

In the July/August *President's Column*,[1] Dr. Dean indicates that a few provinces have an "inherent conflict" in situations where regulators and provincial dental associations are one and the same, and he questions "whether it is only a matter of time before these organizations are separated into 2 distinct bodies in every province."

To not respond to Dr. Dean's article would imply agreement. As president of the New Brunswick Dental Society, a dual function province, we find his comments ill-advised and unfortunate. We are proud of our successes in fulfilling both the public and member interest mandates.

With less than 20,000 dentists in Canada, we are a very small subset of the population. The profession needs cohesion to optimize our collective work towards the betterment of the profession and the public it serves. We would encourage CDA at this time, more than ever, to be inclusive in its messaging; divisive statements such as those made in Dr. Dean's column serve no one's best interest.

Dr. Ron Buckley
President, New Brunswick Dental Society

Reference

1. Dean A. Who represents you? *J Can Dent Assoc* 2004; 70(7):437.

Response from the President

Let me express my appreciation for having the opportunity to acknowledge these insightful and well-crafted letters. The July/August *President's Column* provoked debate from colleagues across Canada, and the divergent views expressed by Drs. Busse and Buckley prove the adage that there are indeed 2 sides to every argument. The complex web of issues surrounding self-regulation, provincial dental associations and regulators continues to inflame passion from both sides. I hope that my column fosters further discussion on these and other vital issues that affect the Canadian dental profession now and in the future.

Dr. Alf Dean

Professional Mobility: Truly a Global Issue

I applaud your October editorial[1] for raising the issues of dentist mobility and the problems and challenges which ensue. Maintaining standards is a great challenge in Australia as shortages of dentists lead to calls to lower or remove "barriers" to entry and practice. There are loopholes in our system in Australia which, if we are not careful, have the potential to lead to limited requirements for overseas trained dentists (OTDs) to achieve a suitable level of knowledge or clinical standard.

At present, for most OTDs, we have the Australian Dental Council examinations (consisting of an English test, theory exam and a clinical exam) which require applicants from overseas to be of a standard equivalent to an Australian graduate. Shortages in rural and regional areas

Continued on page 726

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News

Record Number of DAT Applicants

If recent registration figures for the Dental Aptitude Test (DAT) are any indication, demand is higher than ever amongst prospective Canadian dental students.

The November 2004 DAT registration numbers were the highest in the almost 40-year history of the test — 1,335 registered applicants will write the next DAT at centres across Canada. Of these applicants, 1,141 requested to have the test administered in English and 194 in French.

The DAT registration process is now available online in its entirety on the CDA Web site. The popularity of this online registration is evident, as almost 95% of November 2004 applicants used this method. Online registration could also be a contributing factor towards seeing the total number of applicants tested in 2003/2004 edging over the 2,000 mark for the first time since the early 1970s.

The DAT is conducted by CDA to help students assess their aptitude for a career in dentistry and to assist dental schools in selecting its students.

The DAT is conducted twice each academic year, in November and the following February. Past registration statistics show that demand for the November session is substantially higher than February.

The deadline for completing the online registration for the next DAT in February 2005 is January 15, 2005. ➧

Favourable Ruling for Foreign-Trained Dentists in Newfoundland

The Newfoundland Human Rights Commission released a decision on October 19, stating that 9 foreign-trained dentists had been discriminated against by the Newfoundland Dental Board.

The ruling stems from a complaint made by the 9 dentists that the provincial dental board's failure to convert their provisional licence to a general licence denied them the right of professional mobility.

The 9 dentists came to Newfoundland over 20 years ago and were granted provisional licences by the dental board to practise in specific geographic locations. However, the dental board negotiated a Mutual Recognition Agreement with other governing dental bodies across Canada, which provided national mobility for dentists who held general licences on or before July 1, 2001.

When the 9 dentists asked the dental board to convert their licences, the board asked that the dentists enlist in a costly professional development series to qualify for licence conversion.

This recent ruling noted that the dental board's failure to exercise its discretion to grant the dentists a general licence prior to July 1, 2001, had an adverse effect (lack of national mobility) on the 9 dentists because of their national origin. This ruling applied despite the fact that the dental board may not have intended to discriminate against the dentists.

According to Barry Fleming, the executive director of the Newfoundland and Labrador Human Rights Commission who represented the 9 dentists in this matter, this decision could have far-reaching ramifications: "I'm sure there are a lot of people looking at this case with interest. All professions, under international trade agreements, have mutual recognition agreements in place, so the principles negotiated in this decision will affect all those other recognition agreements."

The registrar of the Newfoundland Dental Board, Dr. Paul O'Brien, expressed disappointment with the

COVER ARTIST

The cover art for this issue is a painting by **Dr. Kris Row**, a Winnipeg-based orthodontist and artist. Dr. Row's love of painting is a lifelong passion that was reignited when his wife found his original portfolio in university and offered him new art supplies for Father's Day. His favourite medium is acrylic or oil on panel and when he travels he usually brings his watercolours with him.

The painting on the cover, number 4 in a series of 13, is titled *Full Mouth Reconstruction* (18" × 22" oil on canvas). The series is based on Dante's *Divine Comedy*, which tells the tale of Virgil's journey through Hell, Purgatory and Heaven. In Dr. Row's series, Virgil is replaced by a dentist.

Dr. Row initially trained at Queen's University (BA 1976), then at the Universities of Toronto (DDS 1979) and Manitoba (MSc 1987). He currently maintains an orthodontic practice in Winnipeg. ➧

ruling and noted the board's intention to appeal the decision to a higher court.

Complete details of the Commission's decision can be found at http://www.gov.nl.ca/releases/2004/just/1025n04.htm.

International Declaration on Oral Health for Patients with HIV/AIDS

Following the 5th World Workshop on Oral Health and Disease in AIDS, held in Phuket, Thailand, from July 6–10, representatives of 27 countries unanimously issued the Phuket Declaration, which calls on national and international health authorities, dental associations and research institutions to strenghten their efforts for the effective control of HIV/AIDS-related oral disease.

The workshop was co-sponsored by the World Health Organization (WHO), whose Global Oral Health Programme aims to facilitate intercountry exchange of information and experiences in health promotion and prevention of oral lesions related to HIV infection. The workshop brought together more than 150 researchers and public health administrators for discussions on topics such as epidemiology and management of HIV disease, pathogenesis of HIV and vaccine research, and collaborative research and funding mechanisms.

WHO estimates that approximately 40 million people were infected by HIV/AIDS in 2001. Oral manifestations of HIV infection are a growing disease burden in several regions of the world. The WHO Oral Health Programme gives priority to initiatives that will help to reduce this disease burden. For more information on the WHO Oral Health Programme, go to http://www.who.int/oral_health/en/.

The full text of the *Phuket Declaration on Oral Health and Disease in HIV/AIDS*, can be viewed at http://www.who.int/oral_health/media/en/orh_puket_declaration_en.pdf.

FDI Statements on Oral Health

The FDI World Dental Federation adopted 4 new statements at its 92nd Annual World Dental Congress held in India in September. The statements dealt with continuing dental education, endorsement of ISO standards, quality of dental implants, and code of practice on tobacco control for oral health organizations. The statements are reprinted in this edition of *JCDA* on pages 670–1.

Novartis Changes Warnings on Bisphosphonate Drugs

Novartis has updated the U.S. package insert that accompanies its Aredia (pamidronate disodium) Injection and Zometa (zoledronic acid) Injection bisphosphonate brands.

Bisphosphonates are medications used in the management of hypercalcemia, osteolytic diseases due to malignancy involving bone such as multiple myeloma and metastatic disease and Paget's disease of bone.

The changes to the prescribing information were prompted by spontaneous reports of osteonecrosis of the jaw (ONJ). This reaction occurred mainly in cancer patients receiving treatment regimens that include bisphosphonates for management of bone involvement due to disease. ONJ presents in a manner similar to that of radiation-induced osteonecrosis. Findings include pain, bad taste and bone exposure.

Of particular interest to dentists, most reported cases of radiation osteonecrosis and ONJ have been associated with dental procedures such as tooth extraction and may occur following incidental trauma. The best management is prevention, as current treatment involves the same approaches as post-radiation osteonecrosis.

Novartis has revised the Precautions and Post-Marketing Experience sections on both bisphosphonate products. Complete details can be found in the FDA Medwatch bulletin at http://www.fda.gov/medwatch/SAFETY/2004/ZometaHCP.pdf.

APPOINTMENT

CAO Elects New President

Dr. Amanda Maplethorpe

The new president of the Canadian Association of Orthodontists (CAO) is Dr. Amanda Maplethorpe, an orthodontist from Maple Ridge, British Columbia. Dr. Maplethorpe has served on several CAO committees, including By-laws and Policy & Procedures. She is a past president of the British Columbia Society of Orthodontists.

Dr. Maplethorpe obtained her DMD from the University of British Columbia in 1978 and her Certificate in Orthodontics from the Oregon Health and Science University in 1981.

For direct access to the Web sites mentioned in the News section, go to the November *JCDA* bookmarks at http://www.cda-adc.ca/jcda/vol-70/issue-10/index.html.

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The FDI Annual World Dental Congress will provide delegates with international and regional speakers to share their latest knowledge covering a wide range of dental methods and products. A host of limited attendance courses will be available to choose from along with the opportunity to present your own Free Communication or Poster. All sessions of the Scientific Programme and World Dental Exhibition will be held at the Palais des Congrès in the heart of downtown Montréal.

A visit to Montréal would not be complete without gazing across the city from one of the many belvederes that grace Mont Royal. Amongst the modern architecture you will find Victorian manors, great shopping centres, cafes with city parks and many green spaces. And no visitor should miss the internationally renowned botanical gardens and its remarkable Insectarium.

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CANADIAN DENTAL ASSOCIATION

LES JOURNÉES DENTAIRES INTERNATIONALES DU QUÉBEC

Statements by the fdi

Endorsement of ISO Standards

The International Organization for Standardization (ISO) is a network of national standards bodies ('Member Bodies') working in partnership with international organizations, governments, industry, business and consumer representatives. It is a bridge between public and private sectors.

Standards and associated documents are developed through 188 Technical Committees (TC), each representing a specific sector of activity. The technical work of developing standards within each TC is carried out by a Sub-committee (SC) and Working Group (WG) structure. The WGs are made up of experts nominated by Member Bodies, and the role of the WG is to produce, by consensus, a draft standard for eventual publication by ISO following a defined approval and voting process. Standards are voluntary documents, but are frequently adopted in legislation by individual countries or groups of countries.

A major sector in ISO is health care technology, and there are about 20 TCs dealing directly or indirectly with health care topics. The principal TC for dentistry is 'ISO/TC106 (Dentistry)'. Its formal scope is 'Standardization of terminology, methods of test and specifications applicable to materials, instruments, appliances and equipment used in all branches of dentistry'. Within TC106 are 8 SCs and 47 WGs, with a total membership of about 300 experts from 24 participating countries and 21 observer countries.

There is a strong relationship between the FDI World Dental Federation and TC106: FDI is a liaison member of TC106, and is represented at TC106 meetings; TC106 is represented in the formal structure of FDI by membership of the Science Committee.

The FDI World Dental Federation recognises the work of ISO TC106 (Dentistry) as important to dentistry and recommends, where possible, the use of TC106 and other ISO standards in dental practice as a basis for the clinical practice of dentistry.

Adopted by the FDI General Assembly
12th September 2004 – New Delhi

Continuing Dental Education

Continuing dental education (CDE) is a professional obligation. It is the responsibility of the practicing dentist to be a continuous learner by participating in appropriate educational experiences. The requirement of career long CDE provides awareness to the public that the dental profession is dedicated to the maintenance of high evidence-based education and training standards.

Continuing dental education:

- Applies to general dentists and specialists.
- Should include not only the refinement of existing knowledge and skills but the consideration and application of new developments within the scope of dentistry.
- Assists the dentist to recognize not only areas of interest but also limitations and the need to refer patients for advice and/or treatment.
- Is not concerned with specialist training or the immediate post-graduate training period such as advanced education in general dentistry.

Obligation of the dental profession:

- Ensure the availability of a structured educational system for all dentists.
- Has the responsibility to define the nature and to determine the amount of continuing dental education that is reasonable and attainable by the dentist.
- Assist the appropriate regulatory agencies in determining voluntary or mandatory requirements of continuing dental education.
- Recommend a system that is capable of evaluation for course quality, content and attendance by an audit on a regular basis.

This statement should be read in conjunction with the FDI statement "Basic Dental Education" and the supportive appendices.

Adopted by the FDI General Assembly
12th September 2004 - New Delhi

Code of Practice on Tobacco Control for Oral Health Organisations

In order to contribute actively to the reduction of tobacco consumption and include tobacco control in the public health agenda at national, regional and global levels, it is recommended that oral health organisations will:

1. Encourage and support their members to be role models by not using tobacco and by promoting a tobacco-free culture.
2. Assess and address the tobacco consumption patterns and tobacco-control attitudes of their members through surveys and the introduction of appropriate policies.
3. Make their own organisations' premises and events tobacco-free and encourage their members to do the same.
4. Include tobacco control in the agenda of all relevant health-related congresses and conferences.
5. Advise their members to routinely ask patients and clients about tobacco consumption and exposure to tobacco smoke — using evidence-based approaches and best practices—, give advice on how to quit smoking and ensure appropriate follow-up of their cessation goals.
6. Influence health institutions and educational centres to include tobacco control in their health professionals' curricula, through continued education and other training programmes.
7. Actively participate in *World No Tobacco Day* every 31 May.
8. Refrain from accepting any kind of tobacco industry support — financial or otherwise —, and from investing in the tobacco industry, and encourage their members to do the same.
9. Whenever possible, organisations will give preference to partners who have a policy indicating that they refrain from accepting any kind of tobacco industry support — financial or otherwise — from investing in the tobacco industry and encourage their members to do the same.
10. Prohibit the sale or promotion of tobacco products on their premises, and encourage their members to do the same.
11. Actively support governments in the process leading to signature, ratification and implementation of the WHO Framework Convention on Tobacco Control.
12. Dedicate financial and/or other resources to tobacco control — including dedicating resources to the implementation of this code of practice.
13. Participate in the tobacco-control activities of health professional networks.
14. Support campaigns for tobacco-free public places.

Adopted by the FDI General Assembly
12th September 2004 – New Delhi

Quality of Dental Implants

Background

More than 220 implant brands produced by about 80 manufacturers are commercially available worldwide. These are made from different materials, undergo different surface treatments and manifest in different shapes, lengths, widths and forms. The clinician can in theory choose among more than 2000 implants.

FDI recognizes that:

- Implants made from titanium and titanium alloys appear to perform well clinically in properly surgically prepared bone, regardless of small variations in design.
- The scientific evidence of the influence of dental implant material, geometry and surface topography on their clinical performance is limited and the study methodology is not strong. Hence there is inconclusive evidence for promoting specific implants or implant systems over others.
- Implants are manufactured and sold in some parts of the world without compliance to international standards. It would seem prudent to only use dental implants supported by sound clinical research documentation and which conform to the general principles of good manufacturing practice in compliance with the ISO Standards or FDA (Food and Drug Administration) and other regulatory bodies.
- Most clinical trials on dental implants focus on criteria relative to peri-implant aspects over relatively short observation periods. Such criteria are only surrogate measures for treatment outcome from the patient and general public perspectives.

Submitted by: FDI Science Committee

Reference: FDI Science Committee Project 5-98: Jokstad A, Brägger U, Brunski JB, Carr AB, Naert I, Wennerberg A. Quality of Dental Implants. *International Dental Journal*, 2003; 53: Suppl 3:409-443.

Adopted by the FDI General Assembly
12th September 2004 – New Delhi

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Gloves

Q ***What are some advantages and disadvantages of natural rubber latex (NRL) gloves?***

A NRL gloves are the standard of care with excellent tactility, elasticity and resistance to tearing but are not the preferred gloves for latex-sensitive people. The prevalence of NRL allergy is about 1-6% in the general population and 7-10% in healthcare workers. Improved NRL gloves and other materials are available today. Powderless NRL gloves reduce airborne allergens. Synthetic gloves (vinyl, nitrile, chloroprene, neoprene) are virtually non-allergenic.

Characteristics

Tactility – Most important for the discerning clinician.

Puncture Resistance – Increases with thickness. In general, nitrile > latex > vinyl.

Fit – Gloves may be extra-small, small, medium, large, or extra-large. Fitted (procedure) gloves offer half-sizes from 5.5 to 8.5 and include right- and left-handed shapes and anatomical contours.

Donning and Removal – Powder (usually cornstarch) or chlorination reduces stickiness. Powder aerosols from NRL gloves are potentially harmful, but not from synthetic gloves. Disposal of chlorinated gloves is an environmental concern.

Allergenicity – Allergen levels in NRL gloves can be reduced in manufacturing. Powderless NRL gloves have reduced airborne particulates.

Defects – New gloves have leakage rates of 2% or less. Non-sterile vinyl gloves have less barrier protection than latex gloves. Most gloves leak more after use.

Effect of Chemicals – Disinfectants, hand lotions and methacrylate monomers can compromise glove integrity.

Shelf-life – 3 months.

Cost – A low- or non-allergenic glove is inexpensive compared to the cost of losing one's career due to latex hypersensitivity. The compatibility of a fitted, properly sized glove during longer procedures is invaluable. ■

Rating Gloves

Product	Company	Material	Type*	TDA Issue	Cost/Pair, $†	Rating
BLOSSOM GLOVES	BLOSSOM DISPOSABLE PRODUCTS - MEXPO	Latex	A,PFA	17-10	0.12	96%
BLOSSOM LATEX EXAMINATION GLOVES	BLOSSOM DISPOSABLE PRODUCTS - MEXPO	Latex	F,PF	20-5	0.14	79%
BLOSSOM WHITE SYNTHETIC VINYL GLOVES	BLOSSOM DISPOSABLE PRODUCTS - MEXPO	Vinyl	F,PF	20-1	0.11	93%
DIAMOND GRIP PLUS	MICROFLEX	Latex	A,PF	17-10	0.13	96%
FREEFORM SE	MICROFLEX	Nitrile	A,PF	–	0.20	ce
HONEYCOMB TEXTURED AURELIA GLOVES	SUPERMAX	Latex	A,PF	20-1	0.13	92%
NEOPRO	MICROFLEX	Chloroprene	A,PF	17-10	0.20	91%

*A=ambidextrous, F=fitted, P=powder, PF=powder-free, PFA=powder-free with aloe, ce=currently evaluating
†Costs are listed for comparison only and are not used to calculate the ratings. All costs are listed in U.S. dollars.

THE DENTAL ADVISOR Recommends:
Blossom Gloves, Diamond Grip Plus, Blossom White Synthetic Vinyl Gloves

96%

Blossom Gloves
(Blossom Disposable Products – Mexpo)

93%

Blossom White Synthetic Vinyl Gloves
(Blossom Disposable Products – Mexpo)

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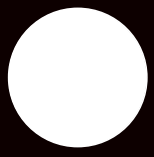
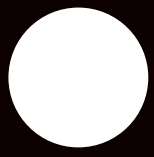
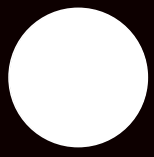


Patient Charting



Scheduling



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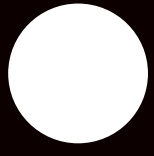
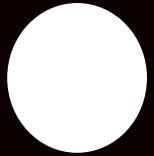
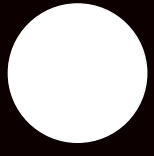


Digital Imaging



Support



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Is Dentistry a Profession? Part 3. Future Challenges

• **Jos V.M. Welie,** MMedS, JD, PhD •

Abstract

In 2 earlier articles a definition of professionalism was developed, and several specific professional responsibilities were deduced. This third and final article in the series examines whether dentistry qualifies as a profession. On various levels, the professionalism of dentistry is found wanting. However, attaining the status of a profession is a work in progress, which means that each profession will always have some deficiencies. The author concludes that dentistry qualifies as a profession but that it is also exhibiting a trend toward once again becoming a business (as it was before the 19th century). For the sake of honesty with the public, dentistry must make a choice between these 2 models.

MeSH Key Words: *dental care/standards; dentist-patient relations; ethics, dental; professional practice/trends*

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This article has been peer reviewed.

Without exception, dentists claim to be professionals, but their justification for this claim appears arbitrary. For example, both the American College of Dentists (ACD)[1] and the Canadian Dental Association (CDA)[2] consider dentists' distinctive expertise to be an important token of their professional status. Indeed, CDA considers expertise the primary foundation of dentistry's professional status.[2] However, in the first article of this series[3] I showed that there is no necessary connection between expertise and professionalism. Educating 6-year-old children does not require a doctoral degree, yet elementary school teachers *are* professionals because they have committed themselves to the care of children. In turn, parents entrust their vulnerable children to these teachers, whose pedagogical competence fulfills a significant existential need.

CDA states that "dentistry is a profession, in part, because the decisions of its members involve moral choices."[4] The ACD, on the other hand, claims no such relationship between the need to make moral choices and one's status as a professional.[1] Instead, it lists responsibility to the larger community as a decisive criterion, one that, conversely, is not listed by CDA.

Finally, both CDA and ACD agree that autonomy or self-regulation is a hallmark of dentistry's professional status, but both organizations seem to imply that professional autonomy is a right — CDA uses the term "privilege"[5] — rather than an obligation. Although no analogy is made with the patient's right to autonomy, use of the term "autonomy" suggests that they are comparable. Patient autonomy is the patient's right to self-determination, the freedom to accept or reject medical treatment even if such a decision is, by objective assessment, harmful to the patient. However, professionals are not free to decide whether, how and whom they will treat. Rather, the profession's autonomy is akin to that of the steward of a financial trust. The steward is free to manage the funds as he or she sees fit, but only if he or she actually manages the money well. If the steward fails, his or her freedom will be restricted or completely withdrawn by the capital's owners. Likewise, the public has entrusted the professions with the management of specific public goods. To that end, the professions have also been granted the necessary freedom of practice. But this autonomy should be understood as a responsibility rather than as a right or privilege.

This article assesses dentistry's claim to professional status in a more systematic manner, using the criteria developed in the 2 earlier articles in the series.[3,6] First, I will examine whether the relationship between dentistry and the public at large qualifies as the kind of social contract that characterizes professions. If it does, the question arises

whether dentistry acknowledges and abides by the various obligations that are implied by the status of a profession.

The Social Contract between Dentistry and the Public

The many codes of ethics that have been written and rewritten by dental associations since the mid 19th century do not themselves prove the professional status of dentistry. After all, there are many examples of statements in codes that are quite trivial (e.g., "The professional dentist … must deal ethically in all aspects of professional life and adhere to rules of professional law") or border on the self-serving (e.g., "The professional dentist … should act in a manner which will enhance the prestige ... of the profession").[7]

A toothache can be a serious source of suffering and disability, resulting in an existential need. More generally, dental needs are serious because they affect people's health. Because effective relief requires a dentist's expertise, from the public's point of view there is every reason to enter into a social contract with dentists. In turn, organized dentistry has professed to assume responsibility for meeting oral health care needs in an altruistic manner, at least since the mid 19th century.

Although oral health care needs are existential and demand expert treatment by dentists, the reverse is not true. Not every treatment performed by dentists is aimed at relieving serious pain or threat to the patient's health. Indeed, more and more of the treatments now performed by dentists are elective, most notably orthodontic and cosmetic interventions. However, ugliness is not a medical indication; it does not necessitate medical treatment in the same way that a toothache, gingivitis or oral cancer does.[8] By definition, dentistry does not qualify as a profession when and to the extent that the interventions performed are purely elective instead of medically indicated. It therefore behooves dentists who focus their practices on esthetic interventions to clearly state that they are not professionals. Doing so does not mean they are incompetent, dishonest or otherwise immoral. It simply means that the ethical structure of their practices differs from that of professional dentists. This is not the place to examine that alternative ethical structure, but it is akin to that of an interior designer rather than an oncologist.

In summary, then, the dental profession can be defined as the collective of oral health care experts who have jointly and publicly committed to altruistically provide their expertise in the service of all patients with important oral health needs and are in turn trusted by the public to do so. The social contract that arises out of the profession's profession and the public's entrusting itself to the profession shares with all other such social contracts the characteristic of there being no tangible evidence of its existence.

The remainder of this article examines whether and how this social contract between dentistry and the public has been operationalized, according to the 3 questions raised in the second article in this series[6]: Who serves? What kind of service is provided? and Who is served?

Who Serves?

Competence of Providers

There can be no question that dentists nowadays have high levels of knowledge, skill and experience. From a historical perspective, the scientific achievements of the past century, including advances in dentistry, are unprecedented. More important, the standardization of dental education ensures that each dental school graduate is competent to practise.

The ever-greater pace with which scientific knowledge and techniques become outdated places graduates at risk of becoming incompetent sooner.

Still, dental educators ought not to become complacent. Even if organized dentistry can now vouch that all dentists are competent at graduation, the ever-greater pace with which scientific knowledge and techniques become outdated places graduates at risk of becoming incompetent sooner. Rather than teaching students to memorize scientific facts, dental schools must foster students' ability to independently gain new knowledge.

Peer Review

Because patients lack the appropriate knowledge, they are usually not in a position to review their dentists. Even if they acquire the necessary knowledge, they cannot always observe what the dentist does, and, once treatment is complete, mishaps may remain hidden for a long time. Hence, it is up to the profession to undertake such review. This is not a pleasant task, but then again, professional autonomy is not a right — it is an obligation.

Most dentists are sole proprietors, and as such they do not benefit from informal peer review such as that occurring in medical clinics, where physicians routinely treat one another's patients, become consultants on each other's cases or, as members of care teams, see the records of a colleague's patients. Fortunately, dental peer review committees now exist in most locales. Unfortunately, most of these committees are only used retroactively for mediating between a disgruntled patient and his or her dentist. Few provide a forum for internal and constructive review by and among dentists. Yet there is much to learn from one's own mistakes and those of one's colleagues. To err is only human, but to not learn from errors is simply unprofessional, even more so given that iatrogenic harm is one of the leading causes of morbidity and mortality.[9]

Internal Discipline

Prospective and constructive peer review can significantly reduce the need for corrective and punitive action. Nevertheless, there will always be a few rotten apples in the basket, and it is the unpleasant duty of the profession to find those rotten apples. The CDA Code of Ethics clearly states that "a dentist has an obligation to report to the appropriate review body, unprofessional conduct or failure to provide treatment in accordance with currently accepted professional standards."[10]

Unfortunately, not all codes of dental ethics are as direct. The Code of Ethics of the American Dental Association (ADA) stipulates that a dentist must report a fellow dentist who appears to be harming his or her patients,[11] but the threshold for doing so is much higher than in the CDA Code of Ethics. The ADA code states only that "gross or continual faulty treatment" should be reported. This suggests that moderately faulty treatment need not be reported as long as it does not happen all the time. Moreover, the remainder of section 4.C and the associated advisory opinion instruct dentists to abstain from unjustified criticism of colleagues and to not make disparaging comments to the patient about the dentist concerned. No advice is given as to when and how best to report.

Noncompetition

Members of a profession should not compete with one another, but the yellow pages, radio commercials and billboards reveal that many dentists engage in competition. The ADA Code of Ethics specifically states that dentists are allowed to advertise.[12] Granted, the advertisements may not be false and misleading, but this restriction is a matter of business ethics rather than professional ethics. American dentists can rightfully lay the blame for this incursion of competition into the practice of dentistry elsewhere. It was the U.S. Federal Trade Commission (FTC) and the Supreme Court which in the late 1970s began to interpret the existing ban on advertising by various professional organizations as unfairly restricting competition.[13] The charge could not have been more ironic. Of course these organizations were trying to prevent competition, for noncompetition is a hallmark of professionalism. The issue therefore is not whether the FTC's charge was correct — for it evidently was — but why the FTC decided to level it against these professional organizations.

This is a most serious question. What made the public, through the FTC, decide to revisit the social contract with law, medicine and dentistry and to curb their professional standing? Was the public simply gambling that it could get a better deal out of dentists by adopting a business rather than a professional relationship? Or had dentistry in fact begun to look more like a business than a profession?

What Kind of Service Is Provided?

It was previously argued[6] that professionals are expected to provide treatments that are, by objective assessment, in the interest of those served. If this tenet is accepted, how should we assess the many cosmetic treatments currently provided by dentists (though rarely medically indicated)? In this regard, it may be instructive to contrast these 2 types of therapy. In the case of procedures with medical indications, such as a root canal, the dentist may tell the patient that he or she really does not need the procedure; if the patient insists that the procedure is required, the dentist can simply refuse to perform it. In the case of a cosmetic procedure, a refusal to perform the procedure makes less sense; few dentists would argue with a patient who is concerned about the appearance of his or her smile and requests veneers, for example. After all, there are no scientific standards by which to judge oral beauty; it is foremost a matter of personal taste or social fashion.

However, even in the area of standard, medically indicated treatments, dentistry still has a long way to go to ensure that all patients receive objectively beneficial treatment. The much-cherished freedom of individual dentists has led to so much variation in treatment that the public has come to believe it is being "ripped off" by dentists.[14] Unlike oncologists, for example, many dentists have continued to resist standardization of treatment even if the available clinical guidelines are based on the best scientific evidence.

Who Is Being Served?

The various codes of dental ethics leave little doubt that dentists are not to discriminate against certain patients, even if a patient is HIV-seropositive or has some other highly communicable disease. Many dentists provide charitable care to indigent patients, and similar initiatives are occurring at the level of organized dentistry. However, here too there is room for improvement. Many dentists claim the right to choose their patients and to dismiss noncompliant patients. Both the ADA and the CDA codes of ethics emphasize the dentist's right to choose who will be served, but such choices raise questions about the profession's commitment to the social contract.

Clearly a dentist should not treat a patient whose needs require some specialized competence that the dentist has not achieved; in that situation, the dentist should refer to another dental practitioner. But a serious problem arises if there are no specialists to whom the patient can be referred because the profession has neglected to develop expertise and train specialists in that area. For example, if it is discovered that patients with Alzheimer's disease — an ever-increasing segment of the population — lack basic oral health care because dentists are not trained to meet their

specific needs, the professional collective must respond. Either the undergraduate dental curriculum must be adjusted, or a geriatric specialty must be created.

Likewise, if oral health care services are beyond the financial means of many people in need, the social contract is violated. Why should the public abide by a contract with a group of service providers who have collectively promised to be altruistic but who charge so much that few members of the public can afford the services? If large numbers of dentists, in an attempt to acquire more wealth, refuse to participate in dental insurance programs, leaving fewer dentists to care for patients of modest financial means, it is up to the profession to redress the situation.

Conclusions

Is dentistry a profession? Notwithstanding the various challenges in the foregoing paragraphs, this question can be answered in the affirmative. After all, attaining the status of a profession is a work in progress, which means that there will always be deficiencies as well.

Will dentistry remain a profession in the years and decades to come? There are signs that the public no longer believes that it will, and there are also many dentists who no longer want dentistry to retain this status — one needs only to count the number of dentists attending "continuing education" sessions about building a million-dollar practice or to calculate the staggering amounts earned on cosmetic dental interventions. Dentistry became a genuine profession only recently. Before the mid 19th century, it was largely a business, and it could certainly revert to that status once again. Although that would be a serious loss for the public, in and of itself, there is nothing immoral about being a business. However, it would be immoral for dentists to continue professing engagement in the social contract when in fact they are operating as business people. The time has come to make a choice and be honest about it. ◆

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The views expressed are those of the author and do not necessarily reflect the opinions or official policies of the Canadian Dental Association.

References

1. American College of Dentists. Ethics handbook for dentists. Gaithersburg: ACD; 2000. p. 3.

2. Canadian Dental Association. Code of ethics: Responsibilities to patients, Article 2: Competency. Available from: URL: www.cda-adc.ca/english/about_cda/code_of_ethics.asp#3.

3. Welie JV. Is dentistry a profession? Part 1. Professionalism defined. *J Can Dent Assoc* 2004; 70(8):529–32.

4. Canadian Dental Association. Code of ethics: Principles. Available from: URL: www.cda-adc.ca/english/about_cda/code_of_ethics.asp#1.

5. Canadian Dental Association. Code of ethics: Responsibilities to the profession, Article 1: Support of the profession. Available from: URL: www.cda-adc.ca/english/about_cda/code_of_ethics.asp#5.

6. Welie JV. Is dentistry a profession? Part 2. The hallmarks of professionalism. *J Can Dent Assoc* 2004; 70(9):599–602.

7. World Dental Federation. International principles of ethics for the dental profession. Available from: URL: www.fdiworldental.org/federation/assets/statements/ENGLISH/Ethics/Principles_of_Ethics.pdf.

8.Welie JV. Do you have a healthy smile? *Med Health Care Philos* 1999; 2(2):169–80.

9. Kohn LT, Corrigan JM, Donaldson MS, editors. To err is human: building a safer health system. Washington (DC): National Academy Press; 1999.

10. Canadian Dental Association: Code of ethics: Responsibilities to the profession, Article 2: Inappropriate conduct. Available from: URL: www.cda-adc.ca/english/about_cda/code_of_ethics.asp#5.

11. American Dental Association. Principles of ethics and code of professional conduct. Section 4.C: Advisory opinion. Available from: URL: http://www.ada.org/prof/prac/law/code/principles_04.asp.

12. American Dental Association. Principles of ethics and code of professional conduct. Section Article 5F: Advertising. Available from: URL: http://www.ada.org/prof/prac/law/code/principles_05.asp.

13. Simpson M, Welie JV, Westerman GH. The troubled history of dental advertising. Part 3: Legal limits. *Nebraska Dent Assoc Newsletter* 2001; 101(1):11–2. Reprinted (with some modifications) in: *Bull International Dental Ethics and Law Society* 2002; 2(1):9–12.

14. Ecembarger W. How dentists rip us off. How honest are dentists? *Reader's Digest* February 1997:50–56.

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Regional Variation in Dental Procedures among People with an Intellectual Disability, Ontario, 1995–2001

• **Robert S. Balogh,** MSc •
• **Hélène Ouellette-Kuntz,** MSc •
• **Duncan J.W. Hunter,** PhD •

Abridged Version

The complete article can be viewed on the **eJCDA** *Web site at: http://www.cda-adc.ca/jcda/vol-70/issue-10/681.html*

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This article has been peer reviewed.

There is increasing evidence of problems with the community-based oral health care of people with an intellectual disability. This group makes up approximately 1% of the population. Although the literature indicates that their prevalence of dental caries is either lower than or similar to the general population, many of their caries go untreated, and extractions are more often used as a means of treatment.

With the closure of institutions for people with intellectual disabilities in the 1970s and 80s, most jurisdictions assumed that community dental practitioners would be available and able to meet the preventive and restorative dental care needs of this group. However, it has been suggested that the oral health of this population has deteriorated since deinstitutionalization, due to lack of access to comprehensive oral care.

A substantial percentage (40%) of day admissions to hospital of those with intellectual disabilities in Ontario are related to dental diseases. In this paper, we examine whether rates of in-hospital dental procedures are evenly distributed across the province of Ontario and discuss possible explanations for the findings.

Materials and Method

A retrospective analysis of routinely collected hospital admission data was undertaken. Data from Ontario hospitals for 1995 to 2001 were obtained from the Canadian Institute for Health Information. Over 40,000 records related to hospital admission of people with an intellectual disability 20–64 years of age were analyzed. Age- and gender-adjusted rates for dental procedures were calculated using the direct method of adjustment and 1996 census population estimates of Ontario. Three different summary measures for the assessment of regional variation were used.

Results

Dental procedures make up 40% of day surgery visits by people with an intellectual disability, and tooth extraction is the most common procedure. The provincial rate of in-hospital dental procedures for this group was 2,534.3 procedures per 100,000 population (or approximately 25 per 1,000). Two areas had dental procedure rates significantly lower than the overall Ontario rate (Hamilton-Wentworth and Quinte-Kingston and Rideau). The 3 district health council areas with the highest dental procedure rates were Niagara, Essex-Kent and Lambton, and Durham-Haliburton-Kawartha and Pine Ridge; all 3 were higher than the overall Ontario rate.

Conclusions

The use of day surgery and in-hospital visits to treat dental diseases in people with an intellectual disability varies considerably by region in Ontario. Although the use of hospitals for dental care for this population can in part be explained by the frequent need to sedate or anesthetize some patients with an intellectual disability to carry out dental procedures safely, the regional variations observed may be indicative of inequities. Further attention to regions with low rates could help shape future community-based dental care practice for this population. ➧

Pigmented Lesions of the Oral Cavity: Review, Differential Diagnosis, and Case Presentations

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• **Marisa Pavone,** DDS •
• **Nick Blanas,** BSc, DDS, FRCD(C) •
• **Grace Bradley,** DDS, MSc, FRCD(C) •

Abridged Version

The complete article can be viewed on the **eJCDA** *Web site at: http://www.cda-adc.ca/jcda/vol-70/issue-10/682.html*

This article has been peer reviewed.

Pigmented lesions are commonly found in the mouth. Such lesions represent a variety of clinical entities, ranging from physiologic changes (e.g., racial pigmentation) to manifestations of systemic illnesses (e.g., Addison's disease) and malignant neoplasms (e.g., melanoma and Kaposi's sarcoma).

Oral pigmentation may be exogenous or endogenous in origin. Exogenous pigmentation is commonly due to foreign-body implantation. Endogenous pigments include melanin, hemoglobin, hemosiderin and carotene. Melanin is produced by melanocytes in the basal layer of the epithelium and is transferred to adjacent keratinocytes via melanosomes. Melanin is also synthesized by nevus cells, which are derived from the neural crest and are found in the skin and mucosa. Melanotic lesions may be brown, blue, grey or black, depending on the amount and location of melanin in the tissues.[1]

Differential Diagnosis of Oral Pigmented Lesions

Evaluation of a patient presenting with a pigmented lesion should include the medical and dental history, extraoral and intraoral examinations, and laboratory tests.[2] The history should include the onset and duration of the lesion, the presence of associated skin hyperpigmentation, systemic signs and symptoms (e.g., malaise, fatigue, weight loss), use of prescription and nonprescription medications, and smoking habits. Pigmented lesions on the face, perioral skin and lips should be noted. The number, distribution, size, shape and colour of intraoral pigmented lesions should be assessed. In general, benign pigmented lesions show regular borders and are small, symmetric and uniform in colour. They may be flat or slightly elevated. In contrast, irregular borders, colour variation and surface ulceration suggest malignancy.

Clinical tests such as diascopy and radiography and laboratory investigations such as blood tests can be used to confirm the clinical impression and reach a definitive diagnosis. However, because it is not always possible to distinguish between a benign pigmented lesion and an early melanoma on the basis of clinical features alone, biopsy is usually recommended for focal oral pigmented lesions that cannot be explained by local factors. This paper includes an algorithm to guide the assessment of pigmented lesions of the oral cavity on the basis of history, clinical examination and laboratory investigations (**Fig. 1**). The algorithm is based on the typical or predominant clinical presentation of the various lesions and should not be taken as an absolute indicator of diagnosis. Moreover, although differences in colour can help to differentiate among pigmented lesions, the interpretation of colour can be subjective and is influenced by the amount and location of the pigment within the mucosa.

An understanding of the causes of mucosal pigmentation forms the basis of appropriate clinical and laboratory evaluation of any patient who presents with a pigmented lesion of the oral cavity and should lead to the correct diagnosis and appropriate treatment. ◆

References

1. Eisen D. Disorders of pigmentation in the oral cavity. *Clin Dermatol* 2000; 18(5):579–87.

2. Kleinegger CL, Hammond HL, Finkelstein MW. Oral mucosal hyperpigmentation secondary to antimalarial drug therapy. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2000; 90(2):189–94.

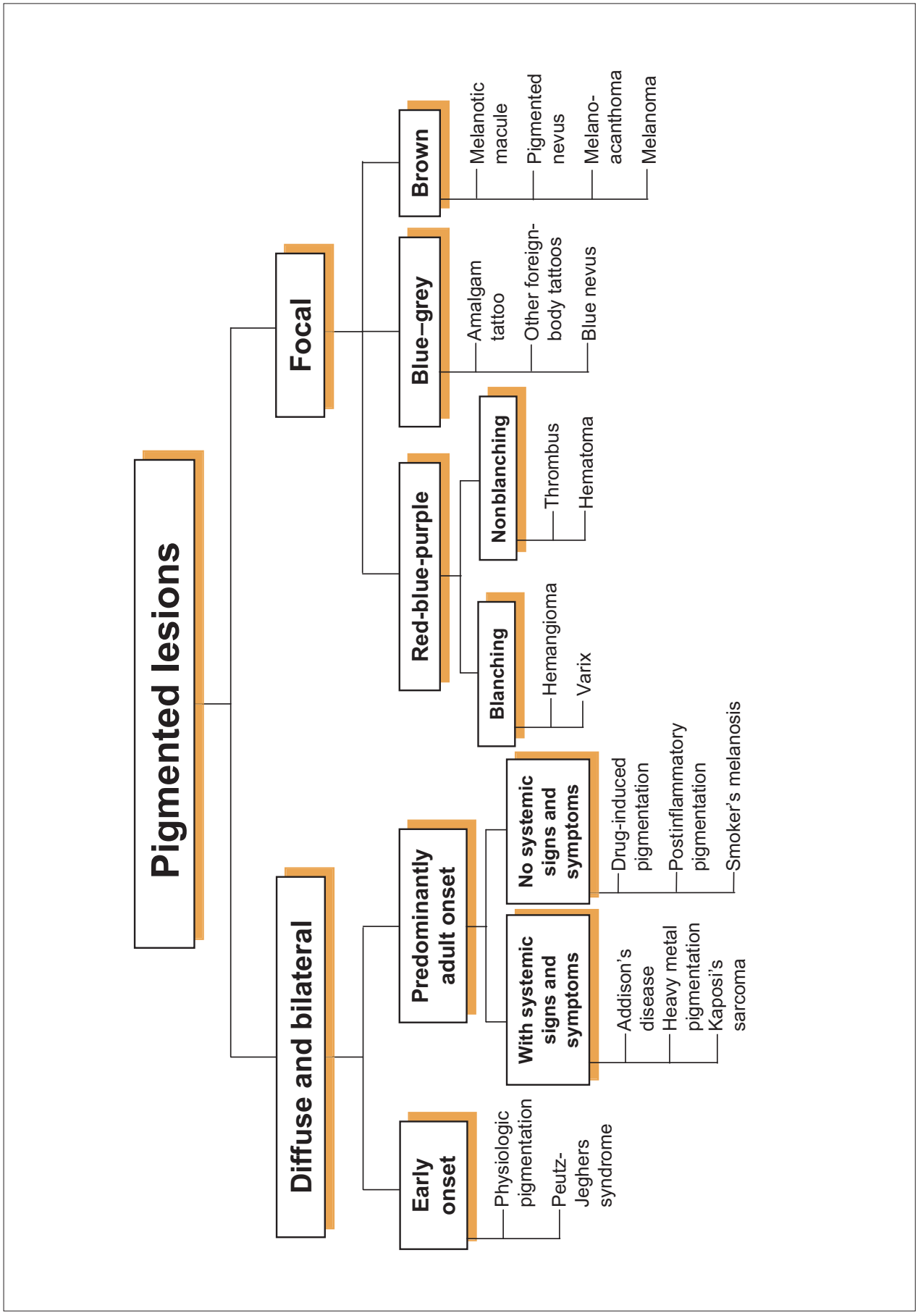

Figure 1: *An algorithm for evaluation of pigmented lesions of the oral cavity.*

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PHILIPS

1. Hope CK, Wilson M. University College London, Eastman Dental Institute. Am J Dent 2002;15(Special Issue):7B-11B. (in vitro study versus the other leading power toothbrush)
2. Donly K. University of Texas. Data on file. (in vivo study)
3. Sorenson JA, Nguyen H. Oregon Health and Science University. Am J Dent 2002;15 (Special Issue):26B-32B. (in vitro study versus the other leading power toothbrush)
4. Based on a 90-day practice-based brand-identified monadic evaluation of Sonicare Elite with Registered Dental Hygienists.

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The Klippel-Feil Syndrome: A Case Report

• **Manuel O. Lagravère,** DDS, MSc •
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Abstract

Short neck and fusion of cervical vertebrae are observed in several genetic conditions and well-defined syndromes. An 8-year-old boy with a short neck, low-set posterior hairline, deafness and limited neck motion was suspected of having such a condition. Clinical and radiographic examination led to the diagnosis of Klippel-Feil syndrome.

MeSH Key Words: *cervical vertebrae/abnormalities; Klippel-Feil Syndrome; malocclusion*

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Klippel-Feil syndrome (KFS) was first described by Maurice Klippel and Andre Feil[1] in 1912 in a patient with congenital fusion of cervical vertebrae. KFS is a complex syndrome of osseous and visceral anomalies that include the classical clinical triad of short neck, limitation of head and neck movements and low posterior hairline.[2] It is associated with several defects, such as deafness, either conductive or neural; congenital heart defects, the most common being a ventricular septal defect; mental deficiency; cleft palate; rib defects; the Sprengel sequence (elevated scapula); and scoliosis.[1,3] Patients with KFS exhibit a smaller lower third of the face and facial asymmetry with no dental implications.[3] KFS occurs in 1 of every 42,000 births, and 60% of cases are in females.[4]

KFS is listed in the Online Mendelian Inheritance in Man database[5] as being of sporadic autosomal dominant inheritance with reduced penetrance and variable expression. The differential diagnosis of this condition includes spondylocostal dysostoses, Poland syndrome, spondyloepiphysial dysplasia and congenital and short-rib polydactyl syndromes.[3] Almost all cases of this syndrome occur sporadically; nevertheless, close evaluation of the immediate family is recommended.[4] Although the prevalence of KFS is very low, it has been related to various anomalies and to fetal alcohol sydrome.[6,7] It has even been speculated that KFS may originate from fetal alcohol syndrome.[7]

The bony malformations present in patients with KFS may entrap and damage the brain and spinal cord.[1] Disorders of the lower vertebral region may become symptomatic during the rapid growth of adolescence or in adult life.[8]

In this report, we present clinical and radiographic findings in an 8-year-old boy with KFS.

Case Report

A Peruvian boy, 8 years old, was brought to the Clínica Estomatológica Central at the Universidad Peruana Cayetano Heredia, Lima-Peru, by his mother for a dental checkup. During evaluation, the mother indicated that at birth he had had a heart murmur and at the age of 3 months, he was operated on for inguinal hernia. Later, at 5 years of age, he was treated for nasal septum deviation. She also indicated that her son had 2 fused cervical vertebrae discovered by his pediatrician; this was later confirmed by a cervical radiograph.

The boy was alert, cooperative and cheerful. Physical examination revealed a short neck, low-set posterior hairline, partly limited neck motion, deafness in the right ear, small lower facial third and facial asymmetry (**Figs. 1a** and **1b**). It also revealed the presence of digital sucking habits.

Intraoral examination showed multiple dental carious lesions and severe anterior crowding (**Figs. 2a** and **2b**),

Figure 1a: *Clinical photograph showing short neck, facial asymmetry and low-set posterior hairline.*

Figure 1b: *Clinical photograph showing back view of low neck.*

Figure 2a: *Upper arch intraoral features at first examination.*

Figure 2b: *Lower arch intraoral features at first examination.*

vertical open bite, deep palate, mouth breathing and poor oral hygiene.

A panoramic radiograph showed normal tooth development with premature absence of the primary upper left second molar and canine; and both lower canines (**Fig. 3**). Bitewing radiographs showed carious lesions with probable pulpal compromise on teeth 55, 75 and 84.

The patient was referred to the departments of pediatrics, genetics, otorhinolaryngology and orthodontics for examination. After examining the boy and family members, the geneticist diagnosed the boy with sporadic KFS with a normal chromosomal karyotype. Otorhinolaryngology examination confirmed partial deafness of the right hearing complex and deviation of the nasal septum.

After orthodontic consultation, the boy was classified with Class I malocclusion with severe crowding. A transpalatal arch or a removable maintainer used jointly with a fixed lingual arch was recommended to prevent more space loss. Occlusal guidance with extraction of the primary molars and fixed orthodontic treatment was also suggested for future correction of the patient's open bite and severe crowding. Careful evaluation of the patient's vertical growth rate will be monitored and precautions taken if necessary.

The treatment plan focused on both prevention and therapy. Special attention was paid to keeping every appointment short due to the patient's condition. In terms of prevention, the boy received a prophylactic treatment and oral hygiene instruction emphasizing the importance of brushing correctly, using dentifrice and rinsing the mouth with fluoride. Sealants were applied to the permanent first

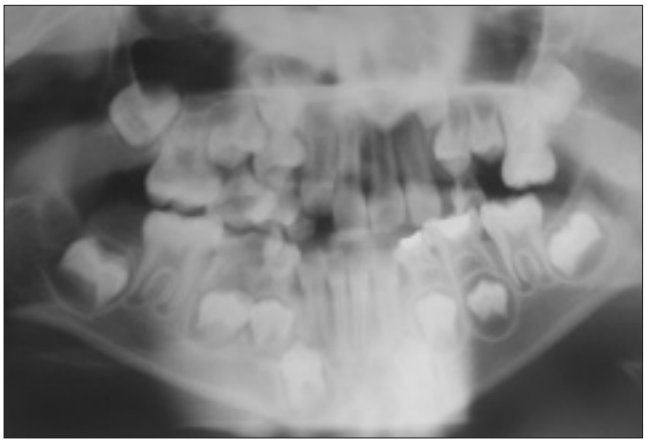

Figure 3: *Panoramic radiograph at the first examination.*

Figure 4a: *Upper arch intraoral features at end of treatment.*

Figure 4b: *Lower arch intraoral features at end of treatment.*

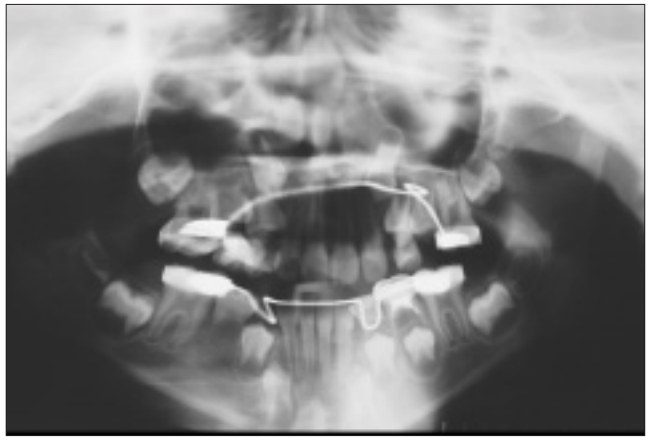

Figure 5: *Panoramic radiograph at end of treatment.*

molars and topical fluoride treatments were provided every 2 months.

Pulpotomies were performed, with formocresol for 5 minutes, on teeth 55, 75 and 84. The lower right primary second molar was extracted. The carious lesions of teeth 64 and 74 were restored with glass ionomer cement (Vitremer, 3M ESPE, St. Paul, Minn.).

The patient was transferred to the orthodontic service of the Clínica Estomatológica Central for evaluation and future treatment. After consultation, fixed lingual and transpalatal arches were placed (**Figs. 4a, 4b** and **5**).

Discussion

Cervical vertebral segmentation anomalies are referred to as the Klippel-Feil anomaly whether they involve fusion of 2 segments or the entire cervical spine. KFS appears to be a failure of the normal segmentation and fusion processes of the mesodermal somites, which occur between the third and seventh week of embryonic development. Webbing of the neck, elevation of the scapula and congenital heart defects are frequently associated with this spinal anomaly.[1,3,9]

Gunderson and others[10] distinguished 3 types of cervical vertebral fusion defect related to Klippel-Feil anomalies: type I – massive fusion of many cervical and upper thoracic vertebrae into bony blocks; type II – fusion of only 1 or 2 interspaces, usually C2-C3 or C5-C6, but there can be intrafamilial variability; type III – both cervical fusion and lower thoracic or lumbar fusion, often associated with multiple organ anomalies and subsequent neurologic compromise. A fourth type of Klippel-Feil anomaly has been suggested to be associated with sacral agenesis.[3]

Our patient presented with a short neck, limited neck movements and a low-set posterior hairline. His symptoms included heart murmur and fusion of the C2-C3 vertebrae without elevation of the scapula. With these features, our patient fits the type II category of KFS well (**Fig. 6**).

Several authors report the association of partial or complete conductive hearing impairment, underdeveloped low-set ears and facial asymmetry in patients with type II KFS.[11,12] These findings are in accordance with the presence of deafness in the right ear, low-set ears and facial asymmetry found in our patient. Because of the high incidence of

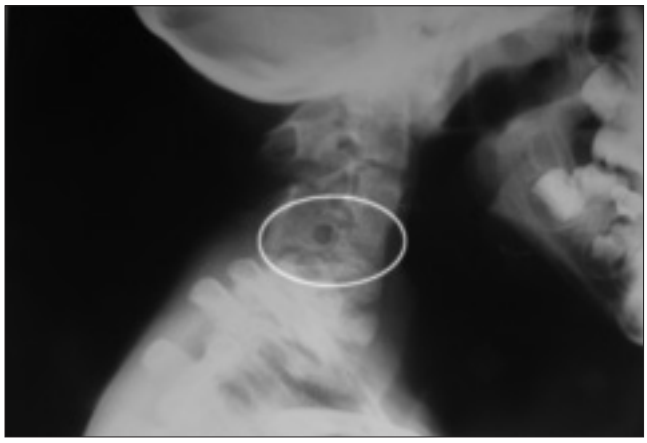

Figure 6: *Radiograph showing fusion of cervical vertebrae.*

hearing loss in patients with KFS, audiologic examinations are recommended. Speech problems can be reduced or avoided when hearing deficiency is recognized at an early age.[13,14]

Clinicians should be aware of the characteristics of KFS when making an oral diagnosis and planning treatment. Dental professionals should check for the presence of a submucous cleft[13,15–17] and congenitally missing teeth[18] as the incidence of these characteristics is high in KFS patients. Orthodontic evaluation should consist of radiographs (cephalometric and panoramic) and model casts for assessment of tooth-size discrepancies.[18]

Considering these factors, our patient was evaluated and treated carefully. Poor oral hygiene and the presence of multiple carious lesions put this patient in a high-risk category. For that reason, glass ionomer cement was used because it releases fluoride into the oral cavity.[19–23] Formocresol was used in the pulpotomy treatment as its efficiency as a medicament for primary molar pulpotomy procedures has been well demonstrated.[24–26]

Rarely, breathing disorders in sleep, such as fatal obstruction sleep apnea, stridor or bradypnea, are seen and all children diagnosed with KFS should be regularly followed for these problems.[27] Mouth breathing and facial asymmetries are frequently observed in patients with KFS. Special precautions should be taken when considering sedation or anesthesia in the pediatric dental office as these patients should not be intubated.[13] ➧

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References

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Active Nonsurgical Decompression of Large Periapical Lesions — 3 Case Reports

• **Jose L. Mejia,** DDS, Dip Endo •
• **Jaime E. Donado,** DDS, Dip Endo •
• **Bettina Basrani,** DDS, Dip Endo, PhD •

Abstract

This paper describes a new nonsurgical approach for treating large periapical lesions which involves using a modified vacuum system within the root canal space. This new technique produces a vacuum effect in the periapical zone, which facilitates evacuation of large amounts of inflammatory fluids. This technique was used in 3 clinical cases, in which the patients presented with copious amounts of exudate draining from within the root canals. Clinical and radiographic results showed long-term resolution of the endodontic lesions. This treatment of the periapical pathology was consistent with the principles of conservative, nonsurgical endodontic procedures.

MeSH Key Words: *catheterization/instrumentation; periapical diseases/therapy; root canal therapy/methods*

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Conventional nonsurgical root canal therapy is the treatment of choice in managing teeth with large periapical lesions.[1] When this treatment does not succeed in resolving the periradicular pathosis, additional options must be considered, such as nonsurgical retreatment or periapical surgery. In the case of very extensive lesions, the undesirable consequences of surgical curettage have led to the use of various marsupialization or tube decompression procedures.[2] Marsupialization is a surgical decompression procedure used to reduce large periapical lesions without periapical curettage.[3] Decompression allows continuous drainage from a periapical lesion to eliminate conditions favouring expansion of the apical pathosis. Over the years a variety of devices have been used in establishing drainage and decompression of large periapical lesions. Tsurumashi and Saito[3] described a method for long-term drainage and decompression of large lesions in which a stainless steel tube is inserted into the canal of teeth with persistent apical exudation. Freedland[4] described several cases in which patients were treated by the placement of polyvinyl or polyethylene drainage tubes through the alveolar mucosa over the apical lesion. Walker and Davis[5] described the placement of a stainless steel canula into the lesion through the involved tooth. However, these techniques were associated with a variety of problems. Patients were responsible for maintaining the patency of the canula, the polyvinyl or polyethylene tubes in the oral mucosa occasionally became displaced, and it was very difficult for patients to perform oral hygiene in the area.

Given that there is no clear consensus on the ideal method of drainage, the aim of this paper is to present an alternative method of treating large periapical lesions: decompression through the root canal space with a vacuum system.

Technique and Case Selection

In each of the cases described below, suction through the involved tooth was sustained for 20 minutes by means of the Endo-eze vacuum (Ultradent, Salt Lake, Utah). This system comprises a high-volume suction aspirator connected to a micro 22-gauge needle (**Fig. 1**). To test the method, patients with large periapical radiolucencies (greater than 200 mm^2 in size), open or closed apices, and copious drainage of exudate through the root canal space were selected. Local anesthesia was administered, a rubber dam placed, and conventional endodontic access prepared; sudden appearance of purulent exudate in the pulp chamber was interpreted as an indication of communication between the periapical lesion and the root canal. Cleaning and shaping of the canal was performed with stainless steel hand files in a step-down fashion, and the canal was then irrigated with 5.25% sodium hypochlorite, with care to avoid injecting the solution into the periapex of teeth with

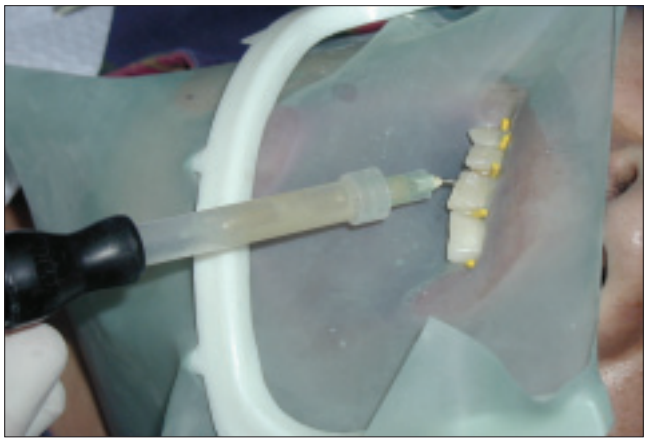

Figure 1: *Endo-eze vacuum system operating in the root canal.*

immature apices. The vacuum needle was inserted into the canal until binding at the apical third and negative pressure was felt. If it was not possible to sense the binding, a cotton pellet was placed in the pulp chamber to improve the vacuum effect in the periapical zone. The high-volume suction was activated, and the resulting negative pressure led to decompression of the lesion. When drainage had partially subsided, the access cavity was closed with a temporary restoration; no intracanal medicament was placed between appointments.

The procedure was repeated a week later and again at weekly intervals, if needed, until no evidence of exudate in the root canal could be detected. At that point, the canals were ready for obturation with gutta-percha. All patients were recalled for monthly follow-up. Any tooth with a mature apex was subjected to obturation immediately after drainage of the exudate ceased. Any tooth with an open apex was obturated with thermoplasticized gutta-percha.

Clinical Reports

Case 1

A healthy 9-year-old girl was referred to the endodontist for treatment of a large periapical lesion around her right maxillary central incisor. Clinical examination revealed tenderness to palpation and percussion; unlike the adjacent teeth, the central incisor did not respond to cold and electrical tests. The periapical lesion measured about 1.6 cm in diameter on radiography (**Fig. 2**). The tooth was anesthetized, isolated and accessed, and a significant amount of exudate drained out through the point of access. The Endo-eze vacuum system was used intermittently before, during and after cleaning and shaping of the canal. The patient was recalled weekly for 2 more appointments to repeat the decompression procedure. At the end of the third session, the canal was completely dry, which allowed intracanal placement of calcium hydroxide to induce apexification and to prevent bacterial contamination. After 14 months, closure of the root canal was clinically and radiographically evident, and the canal was obturated with thermoplasticized gutta-percha. There was complete resolution of the apical lesion (**Fig. 3**), and the root canal was sealed with thermoplasticized gutta-percha (**Fig. 4**).

Case 2

An 18-year-old man presented with a large periapical radiolucency, about 3 cm in diameter, around the left maxillary lateral incisor and canine (**Fig. 5**). He had been referred with a diagnosis of acute apical abscess and had been receiving penicillin V since the previous day. There was labial swelling over the aforementioned teeth, and the area was tender to palpation and percussion. The results of pulpal and thermal tests in both teeth were negative. The teeth were anesthetized, isolated and accessed. Upon access, the lateral incisor drained purulent exudate, which was aspirated with the Endo-eze system. However, the maxillary canine did not drain, so the suction system was not used for this tooth. The root canals were cleaned, shaped and irrigated with 5.25% sodium hypochlorite.

The patient was recalled after 1, 2 and 4 weeks, and the vacuum technique was repeated on the lateral incisor. The canine and the lateral incisor were obturated at 1 and 4 weeks, respectively, after treatment was initiated. After 3 months, the clinical symptoms subsided and partial radiographic resolution was seen (**Fig. 6**); after 8 months, there was complete radiographic resolution of the periapical radiolucency (**Fig. 7**).

Case 3

A healthy 11-year-old girl presented for endodontic treatment of traumatized maxillary left and right central incisors. The patient had previously presented to her general dentist with sinus tracts on the labial soft tissue over the central incisors. The dentist had accessed both teeth, but because he could not control the draining exudate, he referred the patient to the endodontist. As seen radiographically (**Fig. 8**), the periapical lesions were about 1.5 cm in diameter, and both central incisors presented with incomplete apical root development.

Teeth 11 and 21, along with tooth 12, did not respond to thermal and electrical pulp tests. Pulpal necrosis was diagnosed, and the teeth were subjected to nonsurgical endodontic treatment. Once the teeth had been anesthetized, isolated and accessed, copious amounts of exudate drained via the coronal access points of the central incisors, but there was no drainage from the lateral incisor. The Endo-eze vacuum system was used for 20 minutes in each central incisor (**Fig. 9**). The left central incisor was medicated with calcium hydroxide and access was temporarily restored with Vitremer (3M Dental Products, St. Paul, Minn.). One month later the teeth were reopened, and no evidence of exudate was detected. The teeth were remedicated with calcium hydroxide to prevent bacterial

Figure 2: *Case 1. Periapical radiograph shows radiolucency approximately 1.6 cm in diameter associated with the immature apex of the right maxillary central incisor.*

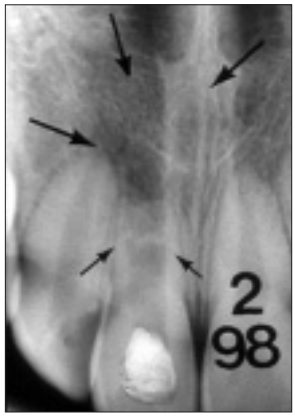

Figure 3: *Case 1. Fourteen months later, apexification was complete. The smaller arrows indicate the apical barrier, and the larger arrows indicate the area of healing.*

Figure 4: *Case 1. Postobturation radiograph. The root canal was sealed with thermoplasticized gutta-percha.*

Figure 5: *Case 2. Periapical radiograph shows a radiolucency about 3 cm in diameter around teeth 22 and 23.*

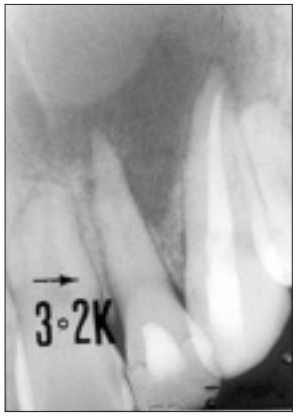

Figure 6: *Case 2. Three months after treatment was initiated, radiographic evidence shows significant healing.*

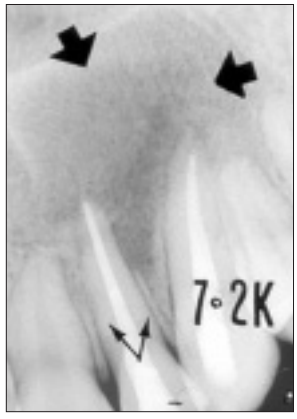

Figure 7: *Case 2. Eight months after initiation of treatment, there was complete radiographic resolution.*

contamination and to achieve apical closure. Three months later, radiography showed almost complete periapical healing and partial root development in the central maxillary incisors (**Fig. 10**). Eight months later, when apexification was complete, the teeth were obturated with thermoplasticized gutta-percha.

Discussion

The treatment options for large periapical lesions may range from conventional nonsurgical root canal treatment with long-term calcium hydroxide therapy to various surgical interventions. Leaving the access point open for continued drainage is not a new procedure, and this technique has often been used for cases in which the endodontic lesions are large and the exudate from the root canal cannot be controlled.[3–6]

This paper describes an active decompression technique incorporating a new vacuum system. The technique facilitates evacuation of apical inflammatory fluids via the radicular canal, without passing through the apical constriction. Other decompression techniques intended to reduce the size of the lesion[3–6] have been effective; however, they depend on patient cooperation, they take a long time, and they do not maintain the basic principles of endodontic therapy, especially with regard to the bacterial contamination through the oral environment. In addition, these techniques have involved use of a surgical technique, causing pain, swelling and discomfort to the patient.[3] In contrast, the technique described in the present report involves a change in pressure. The vacuum system produces a negative pressure, which can be felt by the patient and which may alter the structure of the lesion.

The results of tests of intracanal therapy with calcium hydroxide have been inconclusive.[2,7] In some cases, medication with calcium hydroxide continued between appointments, but in other cases this did not occur. For example, in case 3 in this report, the decompression technique was used in 2 of the teeth with independent apical rarefaction, but in only one of these was calcium hydroxide used to medicate the canal. The canal of the other tooth was left empty and a coronal restoration was used to avoid coronal leakage in both teeth and thus to evaluate the efficiency of

Figure 8: *Case 3. Large periapical radiolucencies are evident around teeth 12, 11 and 21. The cental incisors have immature apices.*

Figure 9: *Case 3. The Endo-eze suction tube in position within the root canal of tooth 11.*

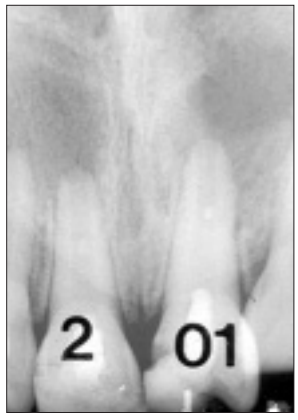

Figure 10: *Case 3. Three months after treatment was initiated, radiographic evidence shows healing is almost complete, and further root development is evident.*

the decompression technique. After 3 months, the degree of healing was similar in all 3 teeth.

Long-term resolution of the endodontic lesions was achieved in all 3 cases reported here. This decompression technique could be used as an alternative to apical surgery for large areas of rarefaction involving anatomic structures.

This technique could also be a good alternative to surgical and nonsurgical endodontic treatment of teeth with large apical lesions, and it could be used in cases where there is direct communication between the root canal and the periapical lesion. However, the question remains whether a patency file could be used to allow application of the vacuum technique in teeth with acute apical abscess.

Additional research should be done to analyze the effect of the vacuum technique on the structure of various lesions (e.g., granuloma, cyst) and the adjacent bone surrounding the lesion.

Conclusions

Use of a vacuum system to apply negative pressure to large apical lesions enabled rapid removal of the periapical exudate through the root canal in teeth with immature apices. This technique respects the basic principles of endodontic therapy, in that the source of bacteria is eliminated through the root canal, the access cavity is kept closed during the whole procedure and the apical foramen is kept intact without altering its position or size.

Active nonsurgical decompression offers the following practical benefits over other techniques:

- The patient experiences less discomfort because no surgical procedures (such as marsupialization or surgical decompression techniques) are required.
- The root canal has no access to the oral environment, which helps in maintaining bacterial control.
- The patient does not have to perform any cleaning, as is the case for surgical decompression or marsupialization.
- It saves time for both the patient and the dentist.
- Invasiveness is minimal because the entire procedure is done through the root canal without compromising anatomic structures, bone or soft tissue. Furthermore, the method allows better healing. ❖

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References

1. Walton RE, Torabinejad M. Principles and practice of endodontics. 3rd ed. WB Saunders Co.; 2002.

2. Oztan MD. Endodontic treatment of teeth with a large periapical lesion. *Int Endod J* 2002; 35(1):73–8.

3. Tsurumachi T, Saito T. Treatment of large periapical lesions by inserting a drainage tube into the root canal. *Endod Dent Traumatol* 1995; 11(1):41–6.

4. Freedland JB. Conservative reduction of large periapical lesions. *Oral Surg Oral Med Oral Pathol* 1970; 29(3):455–63.

5. Walker TL, Davis MS. Treatment of large periapical lesions using cannulization through the involved tooth. *J Endod* 1984; 10(5):215–20.

6. Neaverth EJ, Burg HA. Decompression of a large periapical cyst lesion. *J Endod* 1982; 8(4):175–82.

7. Tjaderhane LS, Pajari UH, Ahola RH, Backman TK, Hietala EL, Larmas MA. Leaving the pulp chamber open for drainage has no effect on the complications of root canal therapy. *Int Endod J* 1995; 28(2):82–5.

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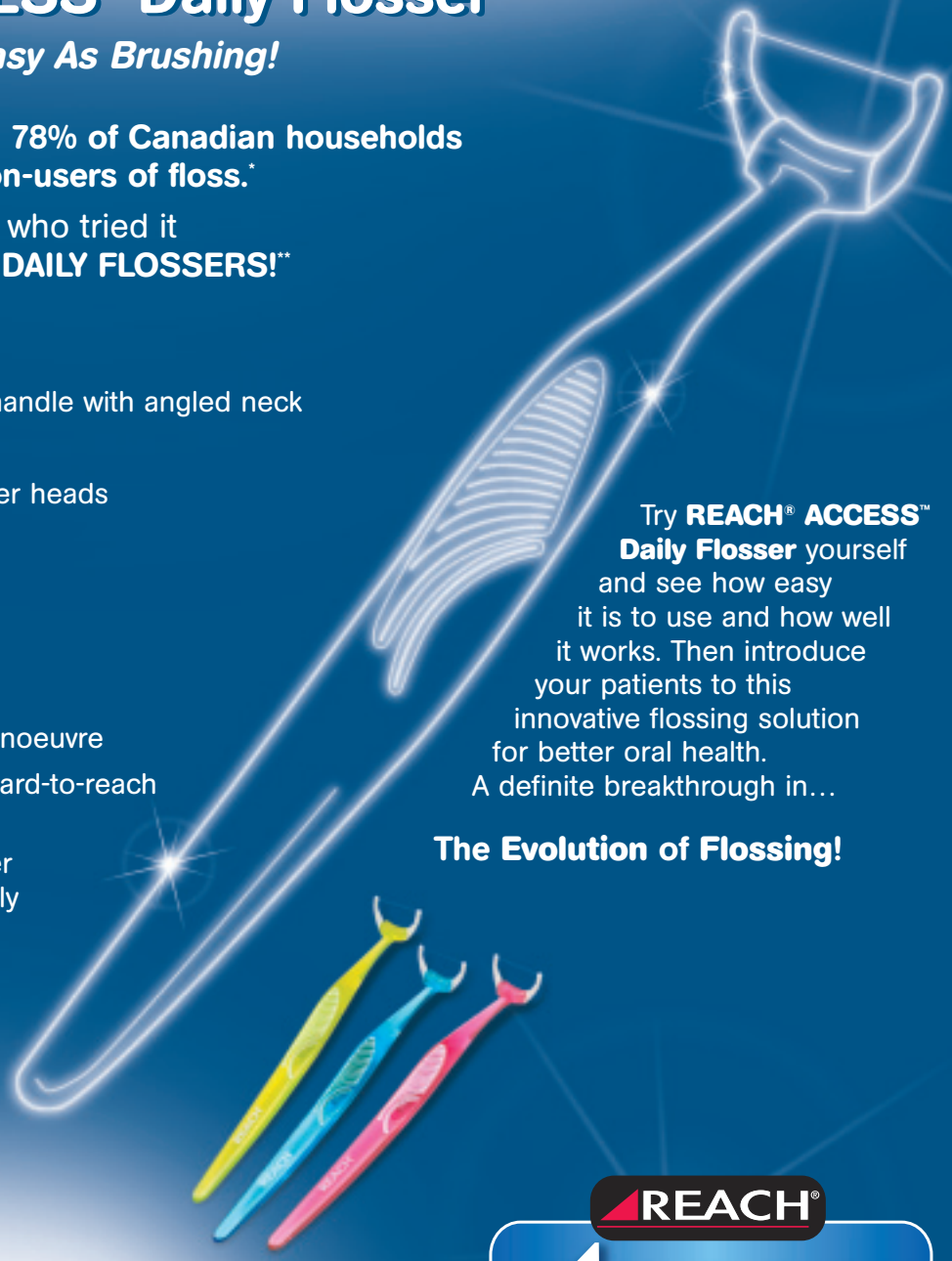

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Influence of Natural Fruit Juices in Removing the Smear Layer from Root Surfaces — An In Vitro Study

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• **José Eduardo Cezar Sampaio,** DDS, MS, PhD •
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Abstract

Certain elements of a patient's diet may be associated with dentin hypersensitivity. The intent of this study was to evaluate the degree of removal of the smear layer from dentin surfaces by various fruit juices. A smear layer was created on extracted human teeth by manual scaling. The roots were reduced and distributed into 8 experimental groups. Distilled water was the negative control. The juices were applied by 2 methods: topical application and topical application with friction. Specimens were photomicrographed and graded according to an index of smear layer removal. With topical application, all but 2 of the tested substances resulted in significantly greater removal of the smear layer and opening of dentinal tubules than was the case with the negative control ($p = 0.05$)*; the exceptions were Gala apple and Italian grape juices, which were no different from the control. For the active application (with friction), most substances removed more smear layer than the control* ($p < 0.05$)*; Gala apple, Italian grape and orange juices were similar to the control. For each of the tested substances, removal of the smear layer did not differ with the method of application (topical vs. friction;* $p > 0.05$*). It is concluded that natural fruit juices can remove the smear layer from dentin surfaces, and the efficacy of this removal varies with the type of juice.*

MeSH Key Words: *dentin hypersensitivity; diet/adverse effects; smear layer*

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This article has been peer reviewed.

Patients often seek professional help for acute tooth pain of sudden onset and short duration that arises when dentin is exposed to various stimuli, typically thermal, evaporative, tactile, osmotic or chemical, and that cannot be ascribed to any other dental defect or disease.[1] The pain occurs during the ingestion of food or beverages that are cold or sweet, during breathing, while the patient is brushing his or her teeth or even while he or she is simply chewing food.[2,3]

This painful situation is known as dentin hypersensitivity[1,2] and has been reported to affect up to 35% of the population.[4] Chabanski and others[5] reported that between 72.5% and 98% of various groups of periodontal patients were affected by root sensitivity.

The most widely accepted theory explaining the pain originating in hypersensitive teeth is the hydrodynamic theory, proposed by Brannstrom.[6] According to this theory, thermal, osmotic or tactile stimuli on the exposed dentinal tubules provoke a rapid flow of dentin fluid toward the oral cavity, which leads to shrinkage of odontoblastic extensions within the dentin tubules and activation of the sensorial units in the dental pulp.

The dentin hypersensitivity could arise from a loss of the dental structure in the cervical region (enamel, dentin or cement), from denuding of the root surface (gingival recession) or after periodontal treatment.[1]

The cement in the cervical region is very thin, ranging from 20 to 50 mm, even when intact and histologically normal. This layer offers very little protection against thermal shock or any other irritant. This cement can be easily removed by the action of tooth scrapers, periodontal curette, abrasive toothpaste, toothbrushes and even food.[7]

Conversely, O'Leary and Kafrawy[8] found residual cementum on the root surface of periodontally involved teeth even after 50 root-planing strokes, which indicated that total removal of the cementum is not a realistic clinical objective with hand instruments.

Once exposed, the dentin may exhibit hypersensitivity, a condition that appears to share many of the etiological factors associated with tooth wear. Tooth wear is rarely attributable to the action of a single physical or chemical agent but arises from interactions between 2 or more of the putative etiological agents.[9,10]

Dentin hypersensitivity may be attributed to various indigenous factors (e.g., defects related to the formation of teeth, defects at the cementoenamel junction, periodontal disease, or systemic disease such as bulimia, nervous anorexia, hyperthyroidism or gastric disturbances), but exogenous factors are also important (incorrect tooth-brushing habits, inappropriate dietary habits, occlusal trauma, clinical procedures like periodontal surgery, other forms of dental treatment, retraction of the gums and wear of the dental structure).

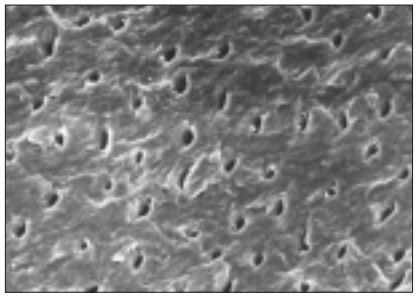

Figure 1: *Photomicrograph of sample treated by topical application of acerola fruit juice shows grade 1 removal of smear layer, characterized by opened dentin tubules (1500×).*

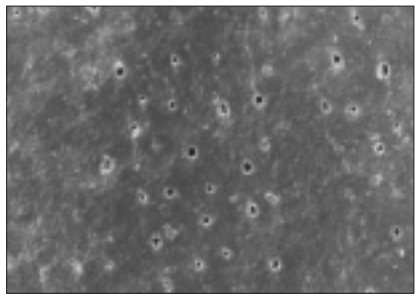

Figure 2: *Photomicrograph of sample treated by friction application of acerola fruit juice shows grade 1 removal of smear layer, characterized by opened dentin tubules (1500×).*

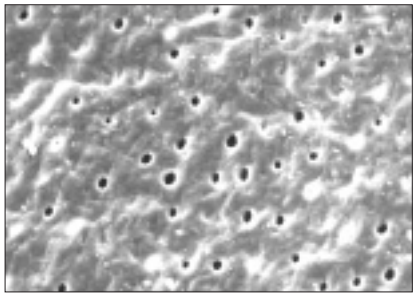

Figure 3: *Photomicrograph of sample treated by topical application of lemon fruit juice shows grade 1 removal of smear layer, characterized by opened dentin tubules (1500×).*

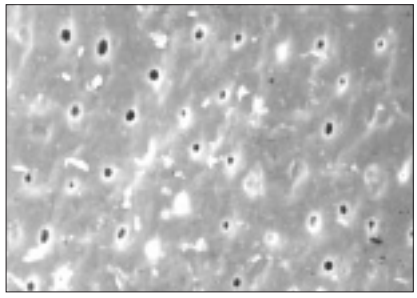

Figure 4: *Photomicrograph of sample treated by friction application of lemon fruit juice shows grade 1 removal of smear layer, characterized by opened dentin tubules (1500×).*

The objective of the present study was to evaluate, using a scanning electron microscope (SEM), the degree of removal of the smear layer present on dentin surfaces associated with various natural fruit juices.

Materials and Methods

The study protocol was approved by the Research Ethics Committee of the School of Dentistry at Araraquara, State University of São Paulo.

A total of 32 recently extracted human teeth were used for the study, without any selection related to tooth type or the patient's sex or age. The teeth had been extracted either because of severe periodontal disease or for orthodontic reasons. From these teeth, a total of 90 dentin samples were prepared. A single operator (FOBC) used high-speed diamond-coated burs to remove the cementum from the cervical portion of the roots. The burs were introduced until the middle of their thickness to obtain standardized samples. Subsequently, the same operator created a smear layer by applying 40 working strokes to each surface using Gracey's curettes 5-6. The roots were then reduced with a diamond disk to obtain dentin samples of 3 mm^2, and the samples were divided randomly into 8 experimental groups, one for each of the 8 natural fruit juices (2 varieties of apple [Gala and green], acerola, kiwi, lemon, orange, pear and Italian grape). Negative control samples were treated with distilled water. The fruit juices were prepared by the investigators immediately before the experiment, and the pH of each was determined at that time. The juices were not buffered, since pH may be a factor in smear layer removal and, consequently, may influence dentinal sensitivity.

Each experimental group and the control group consisted of 10 samples, subdivided into 2 groups of 5 samples each. Fruit juice was applied to the samples by one of the following methods:

- Topical: Samples were immersed in the juice for 5 minutes and washed with a stream of tap water for 15 seconds.
- Topical with friction: Samples were immersed in the juice for 5 minutes, brushed with a soft toothbrush for 30 seconds and washed with a stream of tap water for 15 seconds.

Each dentin slice was considered a sample unit. The samples were submitted to routine processing for SEM analysis and 2 photomicrographs were obtained from the centre of each sample, with magnifications of 750× and 1500×, respectively; these images were intended to be representative of the most common features observed on each

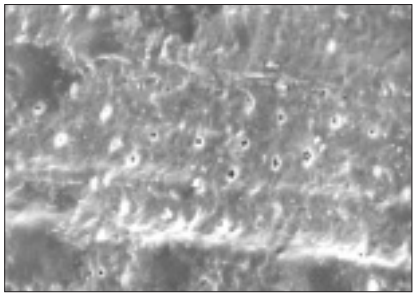

Figure 5: *Photomicrograph of sample treated by topical application of orange fruit juice showing partial removal of smear layer and partial opening of dentin tubules (grade 2) (1500×).*

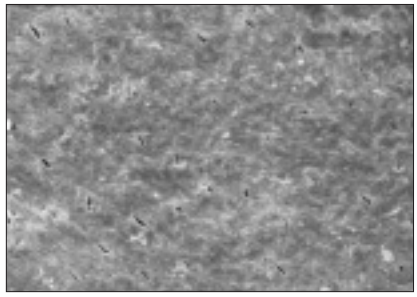

Figure 6: *Photomicrograph of sample treated by topical application of Italian grape fruit juice shows the smear layer is still present on the dentin surface and there are indications of dentinal tubule openings (grade 2) (1500×).*

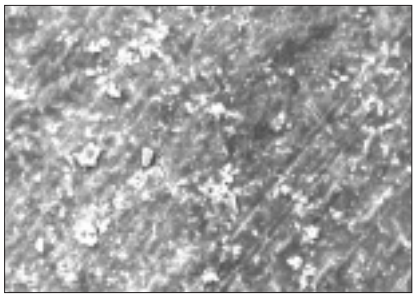

Figure 7: *Photomicrograph of sample treated by topical application of negative control (water) shows the root surface covered by the smear layer (grade 4) (1500×).*

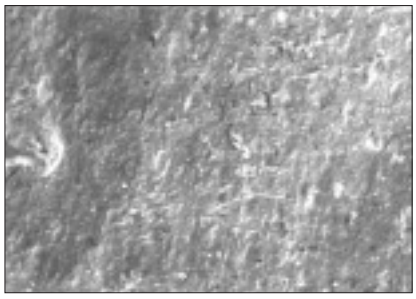

Figure 8: *Photomicrograph of sample treated by friction application of orange juice shows the smear layer present on the dentin surface and obliteration of the dentinal tubules (grade 4) (1500×).*

dentin slice. These photomicrographs were subsequently assessed by one examiner (JECS) who had been previously calibrated and who was blind to the experimental groups, using the following index of smear layer removal:

Grade 1: Complete removal of smear layer, dentinal tubules open (**Figs. 1–4**).

Grade 2: Partial removal of smear layer, dentinal tubules partially open (**Fig. 5**).

Grade 3: Smear layer present on the dentin surface, indication of opening of dentinal tubules (**Fig. 6**).

Grade 4: Smear layer present on the dentin surface, total obliteration of dentinal tubules (**Figs. 7, 8**).

Because the data were based on a graded index, nonparametric analyses were applied. For comparisons among the experimental groups, the different natural fruit juices were considered independent with respect to the method of application (topical vs. friction). Thus, nonparametric analysis of variance was used to compare the groups within each method of application. Then, the Mann–Whitney test was used to compare the 2 methods of application for each natural fruit juice tested. A 5% confidence level was used, and the calculations were performed with the software Statistica, version 5.1 (StatSoft Inc, Tulsa, Okla.).

Results

Figure 9 represents the frequency distribution of grades within each group of samples treated by topical application. There was a significant difference among the substances (Kruskal–Wallis test, $H = 20{,}281$, $p = 0.005$), and post hoc paired comparisons demonstrated that most of the test substances were significantly different from the negative control ($p < 0.05$). The exceptions were Gala apple juice and Italian grape juice, which had grades of predominantly 3 and 4, similar to the control group (grades of 4 for all samples). All of the other groups had an average rank lower than that of the negative control group, which indicates greater removal of the smear layer and greater opening of the dentin tubules.

The results for the application of fruit juices with friction were similar to those for topical application. Again, there was a significant difference among groups (Kruskal–Wallis test, $H = 24{,}553$, $p = 0.009$), and post hoc paired comparisons showed that most of the natural fruit juices were significantly different from the negative control ($p < 0.05$). The exceptions were Gala apple juice, Italian grape juice and orange juice, which had a higher frequency of samples with grade 4 (**Fig. 10**).

A comparison of the test substances, without regard to application method, indicated that lemon juice, green apple juice and acerola juice were associated with lower average rank, indicating a greater loss of the smear layer. For samples treated by topical application, the only significant differences were between Gala apple juice and acerola juice and between acerola juice and Italian grape juice. For samples treated with friction, Gala apple juice yielded results that were significantly different from those for lemon juice, green apple juice, acerola juice and kiwi juice (**Table 1**); green apple juice also yielded results that were significantly different from orange juice and Italian grape juice. The grades from all samples were ranked in ascending order, and the average rank of each group was calculated.

The Mann–Whitney test revealed no significant differences between application methods for each juice (topical vs. friction).

Discussion

In the present work, a smear layer (as shown in **Fig. 7**) was induced by instrumentation with hand curettes, for

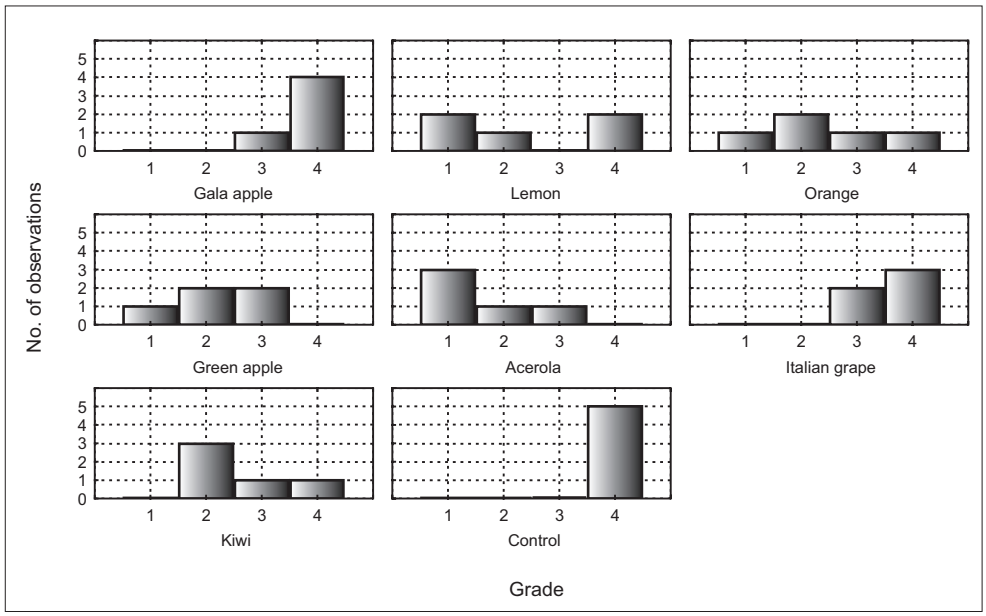

Figure 9: *Frequency distribution of scores for topically applied samples of each substance tested.*

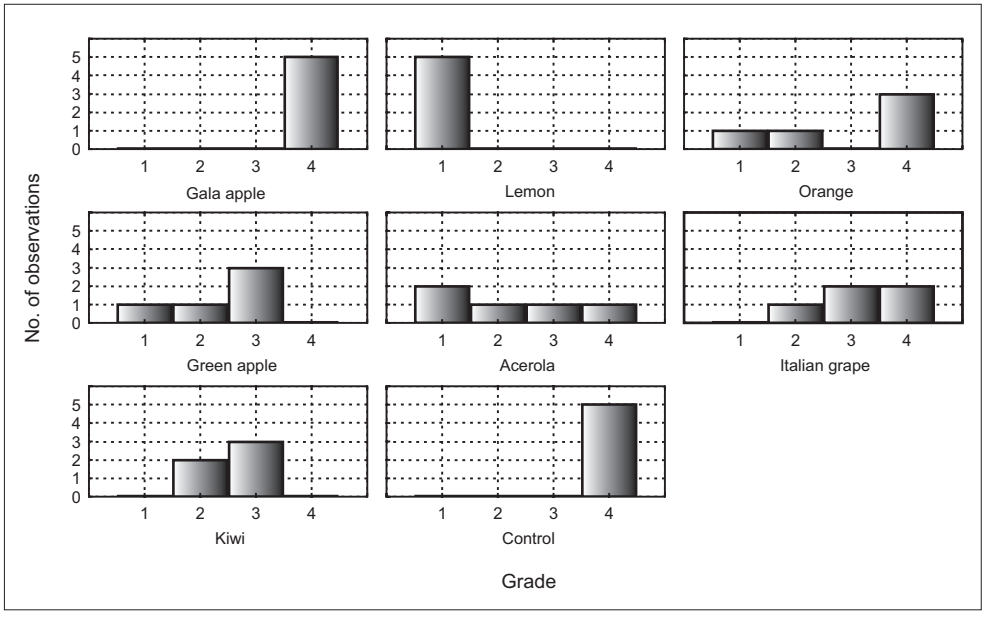

Figure 10*: Frequency distribution of scores for samples of each substance applied with friction.*

potential removal by fruit juices and exposure of dentin tubules (as shown in **Figs. 1–4**).

Dentin hypersensitivity does not occur immediately after scaling and root planing. The smear layer formed on the root surface after hand instrumentation covers the dentin and completely obliterates the dentin tubules (as observed in the present study), which may be why dentin hypersensitivity typically occurs a few days later, when the smear layer has been removed by tooth-brushing, dietary substances, saliva or other endogenous factors.[11]

The pH of a substance is one factor affecting the opening of dentin tubules. Clark and others[12] compared the acidity of common dietary substances, including lemon juice (pH 2.2 to 2.4), orange juice (pH 2.8 to 4.0) and grape juice (pH 3.3 to 4.5). These pH values are in agreement with the results obtained in the present study (**Table 2**).

Some previous studies have indicated that the critical pH for enamel dissolution is 5.5, and any solution with a lower pH may cause erosion.[13,14] Vanuspong and others[15] investigated erosion of dentin by citric acid at different pH values and exposure times to determine whether surface softening or demineralization of dentin occurs and whether the zone can be remineralized by artificial saliva. They concluded that erosion of dentin depends on both the pH value of the acid and the contact time.[15,16] In that study, the critical pH for dentin dissolution was at least as high as pH 6.0 and erosion was considerable even at pH levels well above those observed for most fruits, acidic drinks and some mouth rinses.[15]

In the present study, test substances with lower pH were associated with greater opening of the dentin tubules. Lemon juice (pH 2.2 [**Table 2**]) had the lowest average rank for the active application method (friction) (**Table 1**), whereas Gala apple juice (pH 4.2) had the highest average rank with the same application method; these 2 juices represented the highest and lowest effectiveness, respectively, in terms of removal of the smear layer and exposure of dentin tubules.

Nonparametric analysis of variance (Kruskal–Wallis) showed that all but 2 of the fruit juices tested (the exceptions being Gala apple juice and Italian grape juice) resulted in more effective removal of the smear layer and opening of dentin tubules (**Figs. 1** to 4) than with the negative control (**Fig. 7**). When the substances were actively applied to the dentin samples (friction method), orange juice (**Fig. 8**), as well as Gala apple juice and Italian grape juice, yielded similar results to the negative control. The Mann–Whitney

Table 1 **Average rank[a] of experimental groups, according to tested substance and application method**

Fruit juice	Topical application	Application with friction
Acerola juice	8.9	15.0
Control (water)	32.5	32.5
Gala apple juice	30.1	32.5
Green apple juice	13.8	15.5
Italian grape juice	27.7	23.5
Kiwi juice	17.8	17.0
Lemon juice	17.0	5.0
Orange juice	16.2	23.0

[a]*For each group, the grades from all samples were ranked in ascending order, and the average rank was calculated.*

Table 2 **Acidity of fruit juices immediately after preparation of juice but before application to dentin samples**

Substance	pH
Lemon juice	2.2
Acerola juice	2.8
Kiwi juice	3.2
Green apple juice	3.6
Italian grape juice	3.7
Orange juice	3.8
Gala apple juice	4.2
Control (water)	5.9

test did not reveal any significant differences between application methods (topical vs. friction) for any of the tested substances. Nevertheless, there were some differences in average ranks between the methods of application for the various fruit juices (**Table 1**).

Prati and others[17] evaluated modifications in dentin permeability after application of various acidic drinks and the effect on dentin permeability of brushing procedures with and without toothpaste. They found that dentin permeability after brushing with toothpaste was significantly lower than after brushing without toothpaste, which was in turn lower than that observed with previous application of acid. Toothbrushing subsequent to application of beverages only partially occluded dentin tubules with a thin debris layer that was pulled inside the tubule orifices. In the study reported here, there was no significant difference between the application methods (topical vs. friction) for all but one of the tested substances, the exception being orange juice, which was significantly different from the control group with topical application only (**Fig. 5**). This result suggests that application of orange juice with friction may have induced partial occlusion of the dentin tubules (**Fig. 8**).

McAndrew and Kourkouta[3] assessed the effects of tooth-brushing alone, tooth-brushing followed by exposure to orange juice and tooth-brushing subsequent to orange juice exposure. Their results suggested that in cases of dentin hypersensitivity, tooth-brushing alone was most effective in occluding the tubules, followed by tooth-brushing subsequent to dietary acid application and then by tooth-brushing before dietary acid application. According to these results, tooth-brushing should not immediately precede or follow ingestion of acidic drinks but should be separated from mealtimes. However, the Canadian Advisory Board on Dentin Hypersensitivity[1] has recommended that tooth-brushing occur before ingestion of meals and drinks in patients at risk of erosion or abrasion.

Furthermore, Eisenburger and others[18] suggested that the combination of erosion and abrasion resulted in significantly greater wear than erosion alone, but found no significant differences in wear after brushing with or without abrasive. Simultaneous erosion and abrasion resulted in about 50% more wear than alternating erosion and abrasion.

Absi and others[19] studied the effect of acidic dietary substances on scaled root surfaces and established a relationship between the acid used and the degree of exposure of dentinal tubules. The results of that study may be summarized as follows: application of orange juice (pH 3.0), white wine (pH 2.3) and red wine (pH 2.6) yielded visible dentinal tubules, whereas other substances such as milk and coffee together (pH 6.2) and coke (pH 2.9) were not associated with visible dentinal tubules. Conversely, apple juice (pH 4.1), tannic acid (pH 3.3), citric acid (pH 1.5) and lactic acid (pH 2.0) were associated with opened dentin tubules.

According to the index used in the present study, which represented the degree of opening of the dentin tubules, within the subgroups that underwent active application (friction), there was a much higher proportion of samples with complete obliteration of dentinal tubules in the negative control group (distilled water, pH 5.9) (**Fig. 7**) and the groups treated with Gala apple juice (pH 4.2), Italian grape juice (pH 3.7) and orange juice (pH 3.8) (**Figs. 8**, **9** and **10**). Green apple juice (pH 3.6) and kiwi juice (pH 3.2) were associated with only indications of dentin tubule openings, and the substances with the lowest pH, including lemon juice (pH 2.2) (**Fig. 4**) and acerola juice (pH 2.8) (**Fig. 2**) resulted in complete opening of dentin tubules.

The results of the present study support the hypothesis proposed by many authors,[17–20] whereby the prevention and treatment of dentin hypersensitivity depend on control of the patient's dietary habits and tooth-brushing behaviour, an approach that is also supported by the Canadian Advisory Board on Dentin Hypersensitivity.[1]

Conclusions

This study has shown that the pH of substances applied to dentin samples influenced removal of the smear layer and opening of dentinal tubules. All of the tested fruit juices, except for Gala apple juice and Italian grape juice, promoted a higher degree of removal of the smear layer than the negative control, regardless of the type of application (topical vs. friction). However, with friction treatment, orange juice also showed no significant difference from the control. In terms of applying these results to dental practice, it may be recommended that, whenever possible, an attempt be made to remove or modify factors predisposing the patient to dentin hypersensitivity, e.g., an acidic diet. Fruit juices, particularly from acidic fruits like acerola, lemon and kiwi, can remove the smear layer, open dentin tubules and provoke dentin hypersensitivity. ◆

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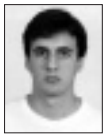

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References

To view the complete list of references, consult the electronic version of *JCDA* at http://www.cda-adc.ca/jcda/vol-70/issue-10/697.htlm.

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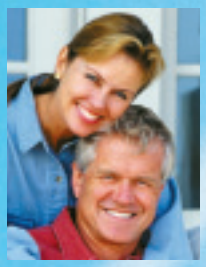

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Point of Care

The Point of Care section of JCDA *answers everyday clinical questions by providing practical information that aims to be useful at the point of patient care. The responses reflect the opinions of the contributors and do not purport to set forth standards of care or clinical practice guidelines. Readers are encouraged to do more reading on the topics covered. If you would like to submit or answer a question, contact editor-in-chief Dr. John O'Keefe at jokeefe@cda-adc.ca.*

Question 1

Dental laboratory technicians warn dentists against the inadvertent creation of a "J" margin when preparing teeth for aluminum oxide and zirconium oxide all-ceramic coping systems. What are they referring to, and how can it be prevented?

All-ceramic restorations that are built over aluminum oxide or zirconium oxide copings (substructures) require a definitive 360° chamfer margin. It must be deep enough to accommodate both the thickness of the coping and the layering porcelains that will be fired over it. No matter what system is used, manufacturing technique will not make up for any serious deficiencies in the design of the preparation, especially in the area of the margin and the cervical third of the crown. Many times our laboratory team members have to deal with chamfers that are too shallow or even nonexistent. This shortcoming, along with insufficient axial reduction, results in crowns that are bulky and much less esthetically pleasing (**Fig. 1**). The solution, of course, is to provide adequate, anatomic axial reduction in conjunction with the preparation of a deeper, definitive chamfer margin.

The "J" Margin

One of the dangers in preparing a definitive chamfer margin is inadvertent creation of a "J" margin. This problem occurs when the apex of the diamond bur passes the edge of the margin, thereby creating a groove inside the margin (**Fig. 2**). It can lead to inaccuracies when physical scanning of the die is required. The resulting sharp, fragile die margins may be degraded during the laboratory procedures needed to construct the coping and the crown. Dental technicians also find it nearly impossible to build porcelain on these sharp margins, and the end result will not be as strong as it should be. There is also the possibility that if the crown makes it through the laboratory phase without incident, the tooth itself might be fractured at these fragile margins, especially if a less-than-gentle approach is used in trying-in a restoration with a potentially poor fit.

The "J" margin can be a problem with any restoration requiring a chamfer margin, including a show-no-metal porcelain-fused-to-metal restoration. Because of the potential problems, laboratory dental technicians should report the finding of a "J" margin to the dentist and ask about the possibility of a revision to the preparation and a new impression rather than building the restoration on this preparation defect.

Clinical Solutions

The 6878K series diamond burs, which are similar to gingival curettage burs with pointed tips, are currently being recommended by some manufacturers to prepare teeth for crowns such as Procera AllCeram (Nobel Biocare, Goteborg, Sweden). In my observation of many cases in multiple dental laboratories, use of these burs by most clinicians tends to result in margins that are too shallow. The 856 chamfer bur series, with a bullet tip design (manufactured by Brasseler USA, Savannah, Georgia; Axis Dental Corporation, Irving, Tex.; S.S. White Burs Inc., Lakewood, NJ; and Premier Dental, Plymouth Meeting, Penn.), is an

Figure 1: *A postoperative photograph shows bulky posterior crowns due to underpreparation.*

Figure 2: *The "J" margin.*

Figure 3: *The 30006 chamfer bur (Brasseler) potentially eliminates the "J" margin because of its centre pin design.*

excellent alternative for preparing a proper and definitive margin. Unlike the K series, these diamond burs carry a greater potential for a "J" margin. However, handled correctly, they can produce a true chamfer margin. To prevent the "J" margin, caution must be exercised to avoid exceeding half the depth of the bur tip, as the margin is circumferentially prepared. In addition, the bur selected must be of the appropriate size for the tooth in question.

Another way to prevent this problem is to use a bur with a non-cutting guide pin built into the tip, such as the 30006 diamond bur (Brasseler) (**Fig. 3**). If you have accidentally created a "J" margin, it is possible to convert it into a modified shoulder margin, which is also acceptable for these types of copings and crowns. To do this, consider using a 10839 end-cutting bur (Brasseler) or another end-cutting bur of similar design to carefully reduce the outer lip of the "J" margin. ◆

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Dr. Adams is one of the presenters at the Pacific Dental Conference, which will be held in Vancouver from March 10–12, 2005. Dr. Adams' sessions, "Excellence in Everyday Esthetics" and "Indirect Composites: Dentistry's Best Kept Secrets!" will be presented on March 10 and 11, respectively.

Suggested Reading

Adams D. The ten most common all-ceramic preparation errors. *Dentistry Today* 2004; 23(10):94–9.

Shillingburg HT, Jacobi R, Brackett SE. Fundamentals of tooth preparation for cast metal and porcelain restorations. Carol Stream (IL): Quintessence Publishing Co.; 1987.

Question 2

What are some of the challenges of treating dental patients who take antidepressant medications?

Major depression (one of the so-called mood disorders) affects millions of Canadians, both directly and indirectly, every year. Antidepressant medications are being prescribed at a record rate, not only for the management of depression but also for anxiety disorders, eating disorders and dementia. A total of 3.75 million prescriptions for antidepressants were written in 1998, a substantial increase over the 2.72 million that were written in 1993. Although not a cure, these drugs, usually prescribed in conjunction with psychotherapy and self-help programs, assist the person in coping with his or her particular disorder. Depression is frequently associated with a disinterest in oral hygiene, steady progression of periodontal problems and a tendency toward a more cariogenic diet, factors that often combine to result in moderate to rampant decay.

Antidepressant Medications

Four major classes of antidepressants exist today: selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants (TCAs), monoamine oxidase inhibitors (MAOIs) and other or atypical reuptake inhibitors (RIs). The SSRIs and RIs, the newest classes of antidepressants, are currently the most commonly prescribed antidepressants in Canada. They include such well-recognized names as Prozac (fluoxetine), Paxil (paroxetine), Celexa (citalopram), Effexor (venlafaxine) and Wellbutrin (bupropion). Each person will respond differently to each antidepressant, and the final choice is often made on the basis of trial and error. At least 3 to 4 weeks is required for a given medication to exert the desired effect by beginning to elevate the patient's mood. Unfortunately, these medications are not without side effects, the intensity of which varies from one patient to another and with the dosage level. The most common side effects include dry mouth (xerostomia), gastrointestinal upset (nausea, vomiting, heartburn), drowsiness, insomnia, headache, sexual disturbances, orthostatic hypotension and tremors. These side effects may be intensified in patients taking other medications, including anxiolytics, lithium or antipsychotics.

Dental Management

Appropriate dental management may necessitate an initial consultation with the patient's physician or psychiatrist to confirm the medication regimen and, if necessary, psychological status. A vigorous preventive dental education program is required to counteract the most frequently reported side effect of antidepressant medication, xerostomia. A protocol for the management of dry mouth should include the following components:

- frequent sipping of water, along with restriction of caffeine and cola beverages
- use of sugar-free gum and candies
- use of saliva substitutes and oral moisturizers
- use of 0.05% fluoride rinses, 0.04% fluoride gels (e.g., GelKam, Colgate Oral Pharmaceuticals, New York, NY), 1.1% fluoride toothpaste (e.g., Prevident, Colgate Oral Pharmaceuticals) and fluoride varnishes (e.g., Durafluor, Pharmascience, Montreal, Que.)

- avoidance of alcohol and alcohol-containing mouth rinses
- restriction or avoidance of tobacco products
- regular monitoring for the development of yeast (*Candida*) infections.
- more frequent recall appointments.

Other potential oral side effects of the SSRIs include dysgeusia, glossitis, stomatitis, discolouration of the tongue and bruxism, the last of which can worsen an already-compromised periodontium.

Other management considerations include any history of associated alcohol or substance abuse (seen in over one-third of patients with depression). Current liver function should be ascertained through the physician before any dental procedures that are likely to induce significant bleeding, such as extractions. In turn, increased vigilance on the part of the dental treatment team is required to detect oral malignancy, which may be associated with the high use of tobacco products in conjunction with alcohol consumption. Among patients taking TCAs, paradoxical hypotensive reactions may occur after use of local anesthetics containing epinephrine. Therefore, care during injection of these drugs is paramount, as is the use of a minimal quantity of epinephrine. Epinephrine-containing retraction cords and hemostatic agents are also contraindicated for patients receiving TCAs or MAOIs.

With sufficient background knowledge of the more common mental illnesses and associated pharmacotherapy, the dental treatment team can provide complete dental care in a safe and compassionate manner. In turn, the dentist and dental staff can contribute to enhancing the patient's self-esteem and can become vital participants in the patient's overall rehabilitation. ◆

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Dr. Clark is one of the presenters at the Pacific Dental Conference, which will be held in Vancouver from March 10–12, 2005. Dr. Clark's session, "The Approach to Dental Care for Patients with Chronic Mental Illness" will be presented on Thursday, March 10.

Suggested Reading

Clark DB. Dental care for the patient with bipolar disorder. *J Can Dent Assoc* 2003; 69(1):20–4.

D'Mello DA. Are your patients depressed? Implications for dental practice. *Oral Health* 2004; 94(2):6–9.

Friedlander AH, Friedlander IK. Dental management of the patient with major depressive disorder. *Oral Health* 2001; 91(10):47–57.

Keene JJ Jr, Galasko GT, Land MF. Antidepressant use in psychiatry and medicine: importance for dental practice. *J Am Dent Assoc* 2003; 134(1):71–9.

Question 3 How do I manage a patient with trigeminal neuralgia?

Trigeminal neuralgia (TGN) is a type of neuropathic pain that is defined by the International Association for the Study of Pain as "a sudden, usually unilateral, severe, brief, stabbing, recurrent pain in the distribution of one or more branches of the fifth cranial nerve." The peak incidence is patients 50–60 years of age; incidence increases with age, and the condition is more prevalent among women. Patients with multiple sclerosis (MS) and hypertension are at greater risk for TGN than the general population.

Managing a patient with TGN requires a comprehensive understanding of the condition. There are no specific diagnostic tests for TGN. Therefore, a detailed history, clinical examination and cranial nerve examination are mandatory, and magnetic resonance imaging (MRI) may be helpful. The clinical characteristics of TGN usually help in the diagnosis. The brief episodes (lasting from a few seconds to less than 2 minutes) are characterized by shock-like "electric" pain of severe intensity, but patients are generally asymptomatic between episodes. The episodes may occur spontaneously but are usually triggered by normally nonpainful stimuli, such as a light touch, wind contacting the skin or shaving. The maxillary and mandibular divisions of the trigeminal nerve are most often affected, although the ophthalmic division can be affected in 1% to 2% of cases. The pain usually does not cross the midline of the face, but the condition is bilateral in 3% to 5% of patients. TGN may also present entirely intraorally, which poses a diagnostic challenge to clinicians and patients.

The pathophysiology of TGN is not completely understood; however, research indicates that the most likely site for the generation of trigeminal pain is within the nerve itself, at the point called the root entry zone. Evidence suggests that a major causative factor for TGN is compression of the trigeminal nerve root at or near the dorsal root entry, usually by an ectatic basilar artery. Plaques of demyelination at the point of trigeminal nerve entry in the

pons, as seen in MS, are another etiologic factor. TGN is diagnosed in 1% to 5% of patients with MS; in a small proportion of patients with MS, TGN is in fact the first manifestation of the disease. Tumours, usually posterior fossa meningiomas or neuromas, are found in 2% of patients with TGN. In most patients, however, TGN is idiopathic.

The differential diagnosis for TGN is extensive and includes a number of pathological conditions affecting the teeth, temporomandibular joints, sinuses, nose, eyes and neck. Conditions that have considerable similarity to TGN include cluster headache, short-lasting unilateral neuralgiform headache, cracked tooth syndrome, postherpetic neuralgia and giant-cell arteritis.

Pharmacological Management

Although only a few randomized controlled trials (RCTs) have been conducted, pharmacotherapy is the mainstay of TGN treatment. TGN responds poorly to anti-inflammatory drugs, acetaminophen or opioids. Antiepileptic agents are the main type of drugs used to manage this condition.

Carbamazepine (400 to 2400 mg per day) has been considered the gold standard in TGN treatment, in spite of its side effects (drowsiness, dizziness, nausea, unsteadiness, idiosyncratic hematologic and hepatic effects, potent drug interactions) and the blood level monitoring that is required. The benefits of carbamazepine become evident within hours to days.

Although no RCTs have been published, oxcarbazepine, a newer drug that is a daughter drug of carbamazepine, has been effective in longitudinal studies. This drug seems better tolerated and has fewer side effects and drug interactions. Serum electrolytes must be measured if the patient is receiving high doses. A 300-mg dose is equipotent to 200 mg of carbamazepine.

Other drugs for TGN that have been tested in RCTs include baclofen, L-baclofen, dextromethorphan, lamotrigine, pimozide, proparacaine, tizanidine, tocainide and topiramate. Drugs that have been used for TGN and described in case reports (with no controls) include capsaicin, clonazepam, gabapentin, phenytoin and valproic acid. Baclofen or lamotrigine can be considered if the side effects of carbamazepine are intolerable. Gabapentin has been effective in other types of neuropathic pain and can also be considered in this situation. However, dextromethorphan, pimozide, tizanidine, tocainide and topiramate are either ineffective or have unacceptable side effects. The evidence for use of topical agents (clonazepam, phenytoin and valproic acid) is poor.

Surgical Treatment

It may be unnecessary to consider surgery if pain control is good and the side effects of medication can be tolerated by the patients. Unfortunately, little information is available to clinicians and patients on when to consider surgery. If pharmacological treatment fails (which occurs in approximately 30% of cases) or there is an obvious structural etiologic factor (e.g., brain tumour), surgical management, through appropriate referral to a neurosurgeon, is required. Surgical options include peripheral nerve block (by mechanical, thermal or chemical means), surgery at the gasserian ganglion (e.g., percutaneous radiofrequency rhizotomy), surgery at the posterior fossa (e.g., microvascular decompression and partial rhizotomy) and gamma knife radiosurgery.

Summary

A primary focus of general dental practice is diagnosis and treatment of trigeminal pain. There are numerous types of trigeminal neuropathic pain of nondental origin that a dental practitioner must understand, including TGN. An understanding of the causes, pathophysiology, clinical manifestations and available treatment options for this type of pain will allow appropriate referral and treatment. Referral to a family doctor, neurologist or another dental practitioner with speciality training in orofacial pain for further assessment and management is recommended whenever definitive diagnosis of orofacial pain cannot be made by the dentist. ➧

Acknowledgement: *The authors acknowledge Donna Hurd, clinic manager, for her assistance in preparing the document.*

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Suggested Reading

Nurmikko TJ, Eldridge PR. Trigeminal neuralgia–pathophysiology, diagnosis and current treatment. *Br J Anaesth* 2001; 87(1):117–32.

Ogutcen-Toller M, Uzun E, Incesu L. Clinical and magnetic resonance imaging evaluation of facial pain. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2004; 97(5):652–8.

Sindrup SH, Jensen TS. Pharmacotherapy of trigeminal neuralgia. *Clin J Pain* 2002; 18(1):22–7.

Woda A, Pionchon P. A unified concept of idiopathic orofacial pain: pathophysiologic features. *J Orofac Pain* 2000; 14(3):196–216.

Zakrzewska JM. Diagnosis and differential diagnosis of trigeminal neuralgia. *Clin J Pain* 2002; 18(1):14–21.

Okeson JP. Orofacial pain: guidelines for assessment, diagnosis, and management. The American Academy of Orofacial Pain. Quintessence Publishing Co, Inc.; 1996.

Question 4

Is it true that facial pain may be the initial presenting symptom in a patient with cancer of the lung?

Unilateral orofacial pain may be the result of numerous conditions, including migraine headaches, cluster headaches, chronic paroxysmal hemicrania, facial herpes zoster, glossopharyngeal neuralgia, giant-cell arteritis, trigeminal neuralgia (TGN), sinus disease, temporomandibular joint disorders (TMD), dental decay, dental abscess, fractured or cracked tooth, and metastatic diseases of the head and neck. When a diagnosis cannot be made, the pain is usually referred to as atypical facial pain.

Although not typically considered, lung cancer must be included in the differential diagnosis of unilateral facial pain in any patient who is a smoker or former heavy smoker. Pain associated with lung cancer has been reported to usually occur in or around the ear, in the jaws or in the temporal region. It has been described as sharp, intermittent, burning, shooting, throbbing, severe and debilitating. Because the pain is unilateral, it may be confused with TGN. However, TGN episodes are shorter and generally resolve with the appropriate anticonvulsant medications. Another difference is that the pain of TGN is often evoked by a stimulus (e.g. simple touch, shaving, brushing teeth), whereas the pain associated with lung cancer is in most cases continuous. It is thought that a lung mass adjacent to or infiltrating the vagus nerve can refer pain to the area of the ipsilateral ear through the convergence of general somatic and visceral afferent nerves in the medulla. The general visceral signals can also cause vague ipsilateral facial pain via convergence at the level of the descending nucleus of the trigeminal system.

Diagnostic Approach

A patient presents in your office with a chief complaint of moderate to severe pain on one side of the head, concentrated around the temporomandibular joint as well as the ear and temporal area. First, rule out any dental causes for the pain (e.g., dental abscess, dental decay). Next, rule out TMD factors (intracapsular and extracapsular disorders). Neurology and otolaryngology consultations may be required to rule out primary headache disorders, giant-cell arteritis, neuropathic pain disorders and sinus disease. Magnetic resonance imaging would be considered to rule out conditions such as acoustic neuroma.

When a definitive diagnosis cannot be made, investigations for lung cancer should be undertaken, especially if the patient has a high risk of cancer (e.g., substantial smoking history). Several publications have now identified referral of pain to the face in association with lung cancer. The facial pain often manifests 6 to 9 months before the lung cancer is diagnosed. Once the lung cancer has been diagnosed, removal of the lesion by resection or radiation therapy has resulted in complete resolution of the facial pain. **Figure 1** is a chest radiograph of a patient with lung cancer.

Figure 1: *Cancer of the lung discovered on a chest radiograph.*

Summary

In summary, although unilateral facial pain in the temporal or auricular regions (or both) may be associated with a variety of conditions, clinicians must be astute in ruling out the possibility of lung cancer. They should pay particular attention to pain that has been previously identified as facial pain of unknown cause in a patient with a history of smoking or exposure to secondhand smoke or other airborne carcinogens. These patients should undergo chest radiography as part of their assessment. Through its early presentation as unilateral severe facial pain, lung cancer could be diagnosed in a more timely manner, which might result in a more favourable long-term prognosis. ◆

Acknowledgement: *The authors acknowledge Donna Hurd, clinic manager, for her assistance in preparing the document.*

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Suggested Reading

Abraham PJ, Capobianco DJ, Cheshire WP. Facial pain as the presenting symptom of lung carcinoma with normal chest radiograph. *Headache* 2003; 43(5):499–504.

Des Prez RD, Freemon FR. Facial pain associated with lung cancer: a case report. *Headache* 1983; 23(1):43–4.

Eross EJ, Dodick DW, Swanson JW, Capobianco DJ. A review of intractable facial pain secondary to underlying lung neoplasms. *Cephalalgia* 2003; 23(1):2–5.

Sarlini E, Schwartz AH, Greenspan JD, Grace EG. Facial pain as first manifestation of lung cancer: a case of lung cancer-related cluster headache and a review of the literature. *J Orofac Pain* 2003; 17(3):262–7.

Shakespeare TP, Stevens MJ. Unilateral facial pain and lung cancer. *Australas Radiol* 1996; 40(1):45–6.

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Clinical Showcase

This month's Clinical Showcase provides step-by-step illustrated instructions for using a scanner for clinical purposes. If you would like to propose a topic or a case demonstration of a clinical problem, or if you would like to recommend a clinician who could contribute to Clinical Showcase, contact editor-in-chief Dr. John O'Keefe at jokeefe@cda-adc.ca.

Converting Your Radiographs into Digital Format

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C. Grace Petrikowski, DDS, MSc, FRCD(C)
Ernest Lam, DMD, PhD, FRCD(C)

Dental practitioners who have film-based radiographs in their patient charts may want to convert these into digital images in order to incorporate them into electronic patient databases; create a backup for the original film-based images; transfer the images on a compact disc (CD) or by e-mail (e.g., for referral to a specialist); or use the images for electronic presentations or lectures (e.g., when using Microsoft PowerPoint).

This article briefly describes the method that the authors have developed to convert radiographs into digital images. Other equally effective methods likely exist.

Requirements

1. A good quality flatbed scanner with a transparency adaptor (**Fig. 1**). Use a good quality piece of equipment from a reputable manufacturer that will provide technical support when needed. A transparency adaptor is essential to obtaining acceptable digital images from radiographs.
2. A computer with a minimum of 512 megabytes of RAM, a high-speed processor, and a hard drive with ample free disc space.
3. A graphics or image processing software program (e.g., software that will allow the manipulation and adjustment of digital images, such as Adobe Photoshop, Photoshop Elements or Jasc Paint Shop). You do not need software that a professional photographic laboratory might use, but you require a program that will allow some basic image processing as described later in this article.
4. A CD burner to back up or store created images.
5. An image archiving software program (e.g., ACDSee or RadFiler) to organize, locate and view images quickly.

Scanning Technique

Remove all staples or other sharp objects from the original radiographs to prevent scratching the glass on the scanning bed. Also, check that the film and the glass on the scanning bed are free of dust and fingerprints.

Intraoral Radiographs (Periapical, Bitewing or Occlusal Radiographs)

Remove the film from its mount to ensure that the entire extent of each image is scanned and that the film is in direct contact with the scanning bed. It is preferable to scan no more than 4 films together at one time. Otherwise, individual periapical or bitewing images may be too small to view adequately on the computer monitor once the digital image is created.

Place the film(s) on the scanning bed, with the film edges parallel to the edges of the scanning bed. Use black opaque blockers (e.g., thin black cardboard, black film) to prevent extraneous light appearing around the edges of the films (**Fig. 2**).

Using the "Transparency" option (**Fig. 3**), choose "Preview" scan (**Fig. 4**). On the preview image, outline the area you wish to scan, including the entire extent of all films in the scan area (**Fig. 5**).

Scan in "Grayscale" (**Fig. 6**) at a scanning resolution of 500–600 dots per inch (dpi), with the image scaled to 100%. With these settings, the scanned image will have the same dimensions as the original (**Fig. 7**). Make sure you are creating an "8-bit" TIFF image with your scan (this may be the default setting of the scanning software) (**Fig. 8**). Name the file using the suffix ".tif" at the end of the file name. This should allow the file to be read by most graphics software programs on other computers.

Panoramic and Other Extraoral Radiographs

Align the radiograph on the scanning bed so the entire extent of the image can be scanned. The scanning technique is the same as described above, except you can reduce the scanning resolution to 400 dpi. Again, scale the image to 100%. When selecting the area to scan, you should exclude unexposed (white) areas at the edges of the radiograph.

Figure 1: *Flatbed scanner with transparency adaptor.*

Figure 2: *Four dental radiographs on bed of scanner, surrounded by black opaque blockers.*

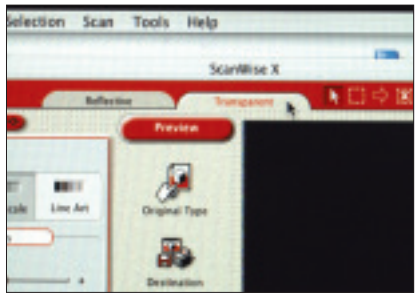

Figure 3: *Use "Transparency" or "Transparent" option when scanning.*

Figure 4: *Choose "Preview" scan first.*

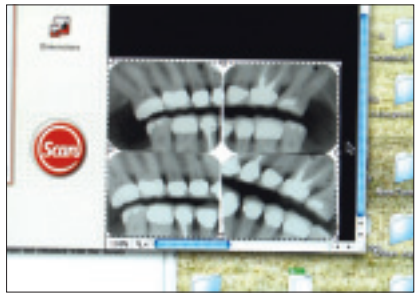

Figure 5: *Preview image with area desired for final scan outlined.*

Figure 6: *Scan in "Grayscale."*

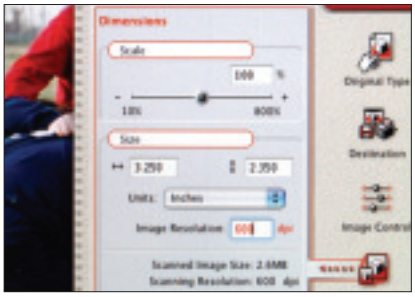

Figure 7: *Scan at 500–600 dots per inch (dpi), at 100% scale.*

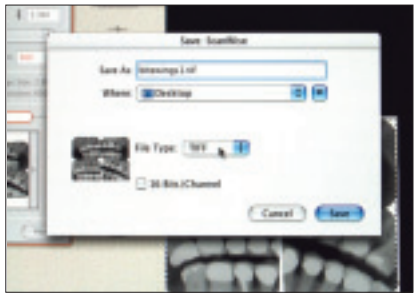

Figure 8: *Create a "TIFF" file when you make your scan. Do not check the 16 Bits/Channel box, as this will create a needlessly large file.*

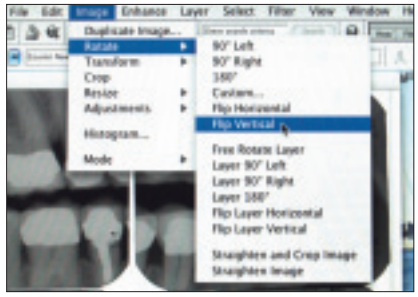

Figure 9: *Correct the alignment of the scanned image to match the original radiograph(s).*

Post-Scanning Adjustment

After the scanned image is created, open the file in a graphics software program. These programs allow you to customize or refine the appearance of the scanned image. If necessary, correct the alignment of the image so it corresponds to the orientation of the original radiograph (**Fig. 9**). Adjust the brightness and contrast as required (**Fig. 10**). Some software programs allow an automatic correction of the contrast (**Fig. 11**). Remove some "Noise" or graininess from the image by using the "Despeckle" or similar command (**Fig. 12**). When the image is suitable, save it to the hard drive of your computer. Perform this image processing using the original TIFF file, then save the changes in TIFF format (with the ".tif" suffix).

A TIFF image is usually a large file size, but it can be compressed by removing some of the information it contains, much of which is not visible to the eye. To compress an image, choose "Save as" (**Fig. 13**) from the File menu of the graphics software program (some software has a "Save a copy" command). Choose to save the image (or a copy of it) as a "JPEG" file (with the ".jpg" suffix) (**Fig. 14**). JPEG compression removes varying amounts of information contained in the original TIFF image. The amount of information removed depends on the amount of image compression chosen. When you first start compressing a TIFF image to create a JPEG, choose a "Medium" level of JPEG quality (i.e. a medium level of compression) (**Fig. 15**). Compare the appearance of the JPEG image to

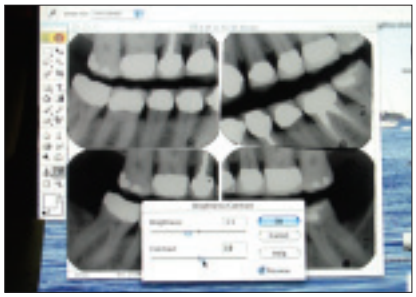

Figure 10: *If desired or required, adjust the brightness and contrast of the scanned image.*

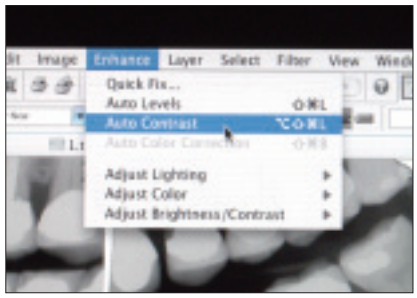

Figure 11: *The software program may allow you to do an automatic correction of the contrast.*

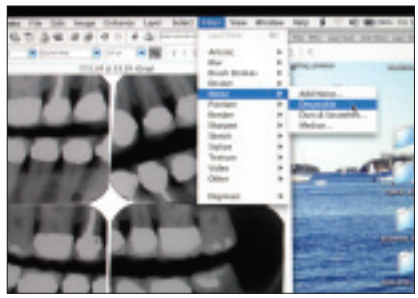

Figure 12: *Using the "Despeckle" command reduces the "Noise" or graininess of the final image.*

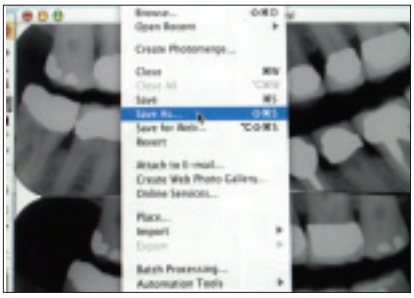

Figure 13: *To compress (reduce the file size) of the scanned image, first choose "Save as" or "Save a copy."*

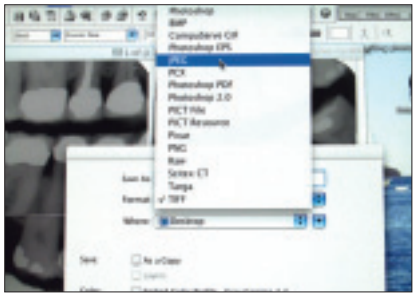

Figure 14: *To compress the scanned image, save it as a "JPEG" file.*

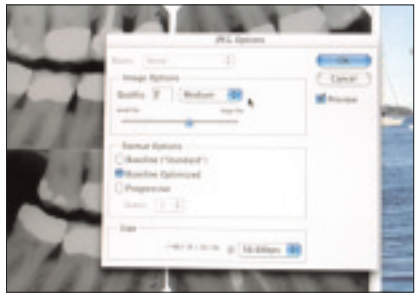

Figure 15: *When creating a JPEG image, first try a "Medium" level of compression.*

Tips on File Size

When scanning radiographs to create electronic images, you are trying to find a balance between reasonable file size and image quality. Here are some tips for achieving this balance:

- File size increases with the scaling of the image. Avoid scanning at greater than 100% scaling.
- File size increases with the size of the area scanned. You should, however, scan the entire area of the original radiograph so that the resultant digital image includes the same information. If you only need a portion of an image for a presentation or similar purpose, you can copy the original TIFF or JPEG image, and crop the area you require using your graphics software program.
- File size increases with scanning resolution. Do not scan at resolutions greater than those described in this article; in some cases, slightly lower resolutions may suffice. Generally, the smaller the original film size (e.g., a periapical film vs. a panoramic film), the higher the scanning resolution required.
- Colour images have a larger file size than grayscale images. Avoid scanning in colour. If you are not satisfied with the results from scanning in grayscale, you may wish to try scanning in colour, but if you do, be sure to convert the image to grayscale during post-scanning adjustment.
- File size will be significantly larger if 12- or 16-bit digitization is chosen for scanning. Use 8-bit digitization, as this should be sufficient.
- JPEG compression allows smaller files to be created, most often with no visible loss in diagnostic quality. You may need to experiment with varying degrees of JPEG compressions.

the original TIFF image. Be sure to always retain a copy of the original TIFF image when performing these JPEG compressions. If you are not satisfied with your initial JPEG compressed image, you can vary the degree of compression until you get a satisfactory result. It is often the case that a JPEG image of medium or low quality will look virtually the same as the original radiograph, or the original grayscale TIFF image.

Try to avoid high levels of JPEG compression (i.e., low-quality JPEG images). You may find that the observed image quality of a low-quality JPEG is unacceptable for viewing, or may not contain all the necessary information.

You can store the grayscale TIFF images in your computer or server as part of your electronic patient database. However, you will use less hard drive disc space if you store the JPEG images instead. JPEG images usually open faster on your computer, and are more suitable for use on a Web site or in an electronic presentation as they download quickly.

Once you have saved the JPEG images, the original TIFF images can be deleted or recorded onto CDs or other media for backup purposes.

Conclusion

Scanning original radiographs allows you to create digital images that can be as diagnostically acceptable as the original radiographs, and can also be used in electronic patient databases or for other technological purposes.

This article illustrated the particular scanning methods developed by the authors. Readers may need to experiment to obtain results that are acceptable for their own needs.

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The authors have no declared financial interests.

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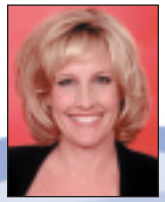

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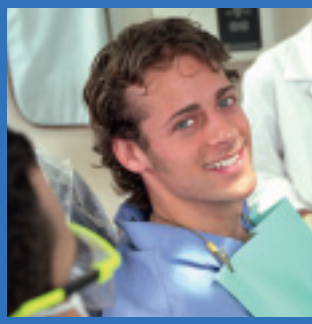

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TSX Composite Index fund (BGI)††	up to 0.67%	18.0%	9.5%	5.5%	8.4%
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International Equity fund (KBSH)	up to 1.45%	-2.5%	-5.0%	-6.6%	n/a
Pacific Basin fund (KBSH)	up to 1.45%	-5.4%	-1.7%	-15.7%	n/a
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Deadline Dates

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January	December 8

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Offices and Practices

ALBERTA - Rimbey: Opportunity to purchase practice or associate with transition to ownership in this family oriented, solo, rural practice. New graduates welcome. Owner willing to assist with transition. Excellent long-term staff. Practice grossing $580,000/year on 4 days/week. Good leaseholds. Low overhead. One hour south of Edmonton. Priced reasonably. Contact: Anne, tel. (403) 843-2173. D1569

ALBERTA - Edmonton: Well-established, solo dental practice for sale, few blocks away from West Edmonton Mall; 3 operatories, very bright and beautiful office; 1200 active and pleasant patients. The present dentist is moving out of Edmonton, will help in transition. Tel. (780) 987-9198. D1495

BRITISH COLUMBIA - Grand Forks: Practice for sale and/or associate needed as soon as possible. Sunny, southern B.C., along United States border. Friendly, well-established general practice with 3 operatories (plumbed for 4) in 8-year-old building. Great patients, excellent long-term staff (including full-time hygienist). Great opportunity for all aspects of dentistry with plenty of growth potential. Assume lease or purchase building. Owner retiring after over 35 years. Will consider all offers including associateship. Contact: Michelle, tel. (250) 442-3741 or (250) 442-2215. D1556

BRITISH COLUMBIA - Fort St. John: Earn full-time wages on a part-time schedule by buying 1/2 of this profitable general practice! We are looking for an enthusiastic dentist to work 3 days a week in our recently renovated, 2,600 sq. ft., 5-operatory office with newly purchased equipment. The clinic currently grosses $960,000 a year with 1 dentist working 4.5 days a week. This opportunity is located in the energetic city of Fort St. John, B.C. Please call (250) 787-1606 or e-mail aadc@pris.ca. Serious enquiries only. D1573

BRITISH COLUMBIA - Victoria: Exceptional family practice for sale in busy plaza location. Well-established practice with long lease. Gross a million +. Six operatories with modern equipment, computerized intraoral camera. High new-patient flow, approximately 2400 active patients. Exceptional opportunity for a progressive, professional. Principal will stay for transitional period if required. Please contact: Bob, fax (250) 475-3216 or e-mail crluck2@shaw.ca. D1537

MANITOBA - Winnipeg: Established general practice for sale. Professionally appraised. Cost-sharing set-up in mall location with great exposure, parking and new patient flow; 4-day work week with above-average billings. Owner returning to academics/graduate studies. Interested parties e-mail drewbrueckner@shaw.ca or leave message at (204) 477-8753. D1425

ONTARIO - Waterloo: Great location, in a busy plaza (6 medical doctors, pharmacy, Tim Horton's, etc.). Single dentist, exclusivity and a great lease with 3 operatories, 2 fully equipped, ceph-pan. Call (905) 889-2727. D1582

Positions Available

ALBERTA - Edmonton: Part-time associate position leading to possible full-time position becoming available in December in a busy general dental practice. Position will include covering 2 evenings and a Saturday. An excellent opportunity in a nicely renovated office. Interested individuals please fax resume to (780) 473-7098. D1612

ALBERTA - Edmonton: Associate opportunity, Today's Dental - www.todaysdental.ab.ca. We are a modern, progressive clinic, situated in west Edmonton, in a very prominent location. We have a large existing patient base and a very healthy new patient flow. We invite a progressive dentist to join our team. We are looking for an ambitious, self-directed leader with strong interpersonal and communication skills, who is interested in possibly an equity position in the future. We are a fee-for-service office that delivers high-quality care, including LVI-trained neuromuscular esthetic dentistry, Cerec and laser therapy. Our entire team is dedicated to continuing education. This is a highly rewarding and well-compensated opportunity. We are committed to excellence and impeccable customer service, with a team that is excited about dentistry. If you want to be part of our team, please e-mail smile_doc@shaw.ca or fax CV to (780) 486-7328. D1602

ALBERTA - Calgary: Associate, full time, in busy new strip mall, in well-established area. Rare, excellent opportunity. Tel. (780) 477-6649, fax (780) 989-0640, e-mail drh@drherchen.com. D1608

ALBERTA - Edmonton: Full-time associate, established office. Tel. (780) 477-6649, fax (780) 989-0640, e-mail drh@drherchen.com. Confidentiality assured. D1610

ALBERTA - Cold Lake: Our well-established family practice is currently looking for an associate to join our friendly team of professionals. We are looking for a compassionate, motivated dentist with excellent communication skills to assume existing patients as the owner gears down for retirement. There is an opportunity for the right individual to buy all or part of this outstanding practice. We have a successful accelerated perio-hygiene department complete with intraoral cameras. You will enjoy providing all aspects of general dentistry in a busy, progressive, computerized family office. If you are looking for a rewarding and satisfying career with a team committed to providing exceptional dental health, please give us a call! We are located just 3 hours northeast of Edmonton. You can enjoy a quality lifestyle in this beautiful lakeside city. For further information, contact: Kelly Avery, tel. (780) 594-5984 or fax your resume to (780) 594-5965. D1581

ALBERTA - West Edmonton: Unique opportunity in booming West Edmonton. Our friendly dental group is seeking a genuinely caring individual to cover a maternity leave for our owner dentist starting in February 2005. You must be extremely gentle, fun-loving and provide excellent individualized dental care to our well-established patients. Enjoy a high-tech (digital x-rays, computerized, etc.), modern facility with an outstanding team. Experience a must; interest in cosmetic dentistry, pediatrics and light sedation an asset. This amazing opportunity could become a full-time associateship as our senior associate plans to retire in late 2005. Please call Dr. Sylvie Renoir at Time to Care Dental Group in Edmonton at (780) 484-5918 or fax your resume to (780) 484-7819. We look forward to meeting you. D1587

ALBERTA: Well-established Alberta practice, located 2 hours from Edmonton, requires full-time associate dentist. Rapidly growing family practice (50-80 new patients per month) located in new building. Please fax resume in confidence to (780) 872-7334. D1590

ALBERTA - High Prairie: Caring, enthusiastic and hard-working associate needed immediately for a very busy general practice. Emphasis on oral surgery and implants. Be as busy as you want to be and enjoy the outdoors. Only 4 hours from Edmonton. Suits new graduate or experienced practitioner. Locums on a regular basis welcome. Fax resume to (780) 523-4434. D1555

ALBERTA - Peace River Region: Associateship available for new graduate or experienced dentist. All phases of dentistry. Current practitioner and hygienist booked until March 2005. Practice is not currently accepting new patients despite constant demand. Set your own hours. Rural lifestyle offers many rewards. Low cost of living, excellent outdoor pursuits throughout region and full-service community only an hour away. Clinic in association with hospital, 3 physicians and visiting optometrist. Tel. (780) 524-3864, fax (780) 524-2299, e-mail fishdoc@telusplanet.net. D1575

BRITISH COLUMBIA - Sparwood: Full-time associate required for busy, modern practice with professional and friendly staff. Associate should be proficient in a wide range of procedures. Sparwood is situated in the Rockies with a wide range of outdoor recreation; 25 minutes to Fernie with a world-class ski resort, 2.5 hours to Calgary. Large existing associate patient base with potential to earn a high income. Tel. (250) 425-0581(evgs.), fax resumes to (250) 425-0582. D1601

BRITISH COLUMBIA - Kamloops: Associate required for a busy general practice. Wide range of dentistry and a wonderful staff. Buy-in an option for the right candidate. Interested applicants please call (250) 374-4544 or e-mail abtucker@telus.net. D1596

BRITISH COLUMBIA - Campbell River: Full-time associate required for a very progressive general practice with a high esthetic component. We are building a new facility with a planned opening of January 2005. We will be expanding hours and looking for a highly motivated dentist to join our exceptional team. The office is located in southern Campbell River in the beautiful Willow point area and offers unbeatable ocean view and recreational opportunities and unmatched lifestyle. Leading to future partnership. Buy-in for the right individual. Fax (250) 287-7392. D1551

BRITISH COLUMBIA - Chilliwack: Full-time associate position available to dentist committed to continuing education/excellence in patient care. Area offers year-round recreation including skiing, boating, hiking, etc., 100 km east of Vancouver, mild climate. Present associate has busy practice and is leaving the area. There is potential for partnership. Reply to: Dr. Michael Thomas, 102-45625 Hodgins Ave., Chilliwack, BC V2P 1P2; tel. (604) 795-9818 (res.), (604) 792-0021 (bus.). D1553

BRITISH COLUMBIA - Invermere on the Lake: Lifestyle in paradise! Ski in the winter at Panorama Mountain Village and enjoy the lake in the

summer. Full-time associate required, ultimately leading to partnership. Well-established family practice in a newly built office at a thriving resort town. Promising opportunity for right individual. Tel. (250) 342-0776, e-mail rskanan@telus.net. D1561

BRITISH COLUMBIA - Gibsons: Associate wanted. Would you like to practise dentistry full time or part time as an associate in a small quaint seaside town on one of the most beautiful coasts in the world? Then Gibsons, B.C. (Sunshine Coast), is the place for you. We are the newest office on the peninsula with Adec/Sirona equipment including intraoral camera and digital x-rays. The town itself offers a good community life with all the best in water and mountain vistas along with all the modern amenities for comfortable living. We are a short majestic ferry ride to Vancouver. Please call us at (604) 886-5395 or e-mail advantagedental@dccnet.com.

D1576

BRITISH COLUMBIA - Terrace: Third dentist needed for a busy practice with 2 experienced dentists and 4 hygienists. Periodontist and oral surgeon plus anesthetist schedule regular clinics in the office. In an area of exceptional natural beauty with outdoor recreation and wilderness adventure opportunities moments away, yet multiple daily flights to Vancouver provide easy access to city getaways. Our flexible practice may be the perfect fit for you if you are just starting out and seeking opportunities to learn new skills, or if you would like to slow down and enjoy a lower-stress lifestyle. Preference given to applicants willing to make a longer commitment, but shorter-term or part-time arrangements could be considered. For more information, please contact: Bonnie Olson, tel. (250) 638-0841. D1547

BRITISH COLUMBIA - Nanaimo: Associate wanted for extremely busy and established dental practice. May lead to long-term commitment (buy in) for the right person. Join a wonderful office with long-term committed staff members. Enjoy the enviable lifestyle that Vancouver Island has to offer. Please call Dr. Lynn Lueke, Dr. Patricia Crosson, (250) 754-1949. D1541

'NAMGIS DENTAL CLINIC

(Alert Bay, British Columbia)
is seeking a

Dentist

We are seeking a highly motivated dentist to operate our modern three-operatory dental clinic. The 'Namgis Dental Clinic serves the residents of Alert Bay and other northern-Vancouver Island communities. The successful candidate will provide a full range of treatment services. An attractive compensation package with a combination of salary and shared billings, plus no overhead, make this an excellent opportunity for someone seeking the rewards and challenges of dentistry without the usual financial stress.

The community of Alert Bay is located in Johnstone Strait, off the northeast tip of Vancouver Island. We offer some of the world's best fishing, whale watching, kayaking, and other outdoor pursuits. The community is also a growing centre for Aboriginal artistic expression in all forms including carving, dance, and other traditions. For more information on the community, please visit our website at www.namgis.org

For more information on the position, please contact:
Ian Knipe, Administrator
P.O. Box 290, Alert Bay, B.C. V0N 1A0
ph: (250) 974-5522, fax: (250) 974-2736 e-mail: IanK@namgis.bc.ca

D1598

calgary health region

Hospital Dentist

A challenging opportunity exists for an energetic dentist in a busy hospital practice. This salaried position provides comprehensive dental care for special needs patients, mentally and physically challenged, as well as medically compromised patients in a teaching hospital setting. Duties include all aspects of routine dental care, as well as performing minor oral surgery, including biopsies, intravenous sedation, diagnosis and management of oral diseases.

Qualifications / Experience:

- Degree in dentistry from an accredited institution and qualified with the National Dental Examining Board of Canada.
- Eligibility for membership / registration with the Alberta Dental Association and College.
- Completion of an accredited hospital residency or previous hospital experience is required. (This is not a training position, however, recent graduates of hospital-based residency programs are welcome to apply.)
- Current BCLS/ACLS.
- Excellent communication skills to establish rapport with clients and dental team members.

The Calgary Health Region is one of Canada's largest fully integrated acute and community health care providers, with more than 22,000 employees. The city of **Calgary** supports an affordable and active lifestyle, about an hour's drive from the Rocky Mountains and Banff National Park. We offer a challenging and team-oriented work environment, rewarding compensation and great benefits (for example – 3 weeks paid vacation after first year). Relocation assistance is available.

All enquiries should be directed to:

Dr. Trey L. Petty, Division Head, Dentistry and Oral Medicine
Foothills Medical Centre, 1403 29 Street NW, Calgary, AB T2N 2T9
Tel (403) 944-2401 • Fax (403) 283-5260 • Email trey.petty@calgaryhealtregion.ca

D1607

NEWFOUNDLAND AND LABRADOR - Mount Pearl: Full-time associate required for busy general dentistry practice. This new 8-operatory office offers a full range of treatments near busy commercial/residential zone. Option to buy in. Please call Mount Pearl Dental, tel. (709) 364-3663 or fax resume to (709) 364-3663. E-mail drwalsh@mountpearldental.nf.net. D1578

NORTHWEST TERRITORIES - Fort Smith: Associate dentist for Fort Smith Dental Clinic. Utilize the full range of your skills working in our modern, well-equipped clinic with skilled and experienced staff. The centre for Wood Buffalo National Park and located beside world-class whitewater of the Slave River rapids, Fort Smith is an ideal location if you love the outdoors. This is a full-time position offering an established patient base and an excellent compensation package. Opportunity for future partnership and/or succession. Tel. (867) 872-2044, fax (867) 872-5813, e-mail whill@auroranet.nt.ca or send resume to: Dr. Hill, Fort Smith Dental Clinic, PO Box 1047, Fort Smith, NT X0E 0P0. D1191

NOVA SCOTIA - Halifax: Associate required for a busy family practice, 2-3 days a week. Please fax resume to (902) 443-5614 or e-mail dentalstaff@hotmail .com. D1542

NUNAVUT - Iqaluit: Associate position(s) available for immediate start. Established clinic offers generous package and full appointment book to associates. All round clinical skills are your ticket to a wide range of recreational activities! No travel required and housing available in Canada's newest and fastest growing capital city. Please apply to: Administration, PO Box 1118, Yellowknife, NT X1A 2N8; or tel. (867)873-6940, fax (867) 873-6941. D1497

ONTARIO - Ottawa (central east): Unique opportunity for associateship leading into buying 30% of a $1.4 million, 6-operatory solo practice. Over 3,500 active charts. Positive, hard-working, goal-oriented dentist with a passion for dentistry required. Bilingual preferred. Tel. (613) 282-5331. D1606

ONTARIO - Central Niagara Region: We are seeking an associate dentist for a family-oriented, well-established practice in the Niagara Peninsula. We offer excellent support staff and hygiene program, in a newly renovated location. Position is either full or part time. Please fax your resume to the attention of the office manager, (905) 734-9878. D1591

ONTARIO - West of Toronto: Excellent associate dentist opportunity you don't want to pass up! Working in a well-established practice with a positive environment and a foundation based on respect, equality and valuing others. From being busy and fully booked on day 1, to ongoing professional development, you will have the chance to practise dentistry at its finest! This modern and progressive practice will keep you exposed to many different aspects of dentistry, like cosmetics, implants and the ability to refer within, as we have many specialists working alongside of us. If you are a team player and are looking for the perfect practice, fax resume to (905) 846-8854. D1568

ONTARIO - Brockville and Morrisburg: Experienced associate required for 1 of 2 well-established, busy practices. Enjoy a small-town atmosphere and the scenic beauty of the 1000 Islands region with easy access to large city centres. Only 30 minutes to Kingston and 60 minutes to Ottawa. For more information contact: Dr. George Christodoulou, Altima Dental Canada, tel. (416) 785-1828, ext. 201, e-mail drgeorge@altima.ca. D1269

ONTARIO - Ottawa East: Associate required. Well-established family dental practice is looking for a bilingual dentist to join its team. Forty minutes to Ottawa, 40 minutes to Montreal, 40 minutes to the Laurentians. For more information, contact: Francine, tel. (613) 632-4159. D1565

ONTARIO - North Toronto: Pediatric dentists wanted immediately for full-time/part-time positions in busy, modern North Toronto pediatric dental practice with in-office general anesthesia. Future buy in possible. Reply to: CDA Classified Box # 2842. D1543

ONTARIO - Fort Frances: Full-time associate needed for extremely busy family dental practice. Strong hygiene program. Newly renovated building with state-of-the-art computerized operatories, intra-oral cameras, digital x-ray, electronic handpieces etc. Excellent staff and working conditions. Practice on American border in northwestern Ontario. Ideal for person with an outdoor, active lifestyle. Emphasis on caring attitude and good-quality dentistry. An outstanding opportunity for the right candidate to become a future partner, if mutually agreeable. Present associate leaving to further education. Please call (807) 274-5365 or (807) 274-5370 (days), (807) 274-5549 (evgs. and wknds.) or fax (807) 274-1738. Write to: 1201 Colonization Rd. W, Fort Frances, ON P9A 2T6. D1516

ONTARIO - Northern: Full-time associate. Our team is currently seeking a disillusioned dentist. We require a practitioner who's still looking for the dream job or whose dream job has turned out to be nothing as expected. If you find you're spending more time sitting in the waiting room reading magazines or newspapers as opposed to treating patients, something is wrong! We are looking for an applicant who wants to relocate outside of the Greater Toronto Area (specifically northern Ontario). Someone who is interested in befriending our patients and becoming part of our community. We require a confident professional who will be excited about successfully practising all facets of dentistry, an individual who will respect/appreciate our team and expect the same back. The applicant should revel at only having to commute 5 minutes to work and be glad for the opportunity to set his or her own schedule. If you want to be part of a community that provides you the opportunity to be a successful and well-respected professional and gives you a viable choice between town living or lakeside dwelling, this may be for you. Should you meet the above criteria please e-mail your resume to natgrant@ntl .sympatico.ca or fax to (705) 335-6556. The successful applicant can expect high patient volume, low downtime, low receivables and high remuneration. D1597

QUEBEC - Eastern Townships: Windsor, near Sherbrooke. We are giving an associate the opportunity to become part of a mature and fully competent team. Pleasant and motivating work atmosphere. Please fax resume to (819) 845-7854. Tel. Dr. Jacques Vaillancourt, (819) 845-3080. D1371

SASKATCHEWAN - Regina: General dentistry practice position offered with North Regina Medical and Dental Clinic. Excellent earning capacity and opportunity for associate to establish practice in the city of Regina without any financial risk. Excellent terms. For details contact: Dr. Ronald Katz, tel. (306) 924-1494, fax (306) 585-5833, e-mail rkatzclinic@accesscomm.ca. D1600

YUKON TERRITORY - Whitehorse: Come for the beauty - mountains, lakes and rivers. Or come for the opportunity to practise dentistry where you are appreciated and well compensated. Have a look at our Web site www.klondike-dental.com. Tel. (867) 668-4618, fax (867) 667-4944. D1422

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A new clinic, in a new building, in a thriving northern city. Six state-of-the-art operatories, digital radiology, booking 4 months in advance. What more could we ask for...

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D1611

TEXAS - Dallas: Growing dental company in and around Dallas is seeking full-time associates. Must be licensed or qualified to be licensed in Texas. Highest compensation package in the state; earn $200,000 - $400,000. Company to handle all immigration matters. Please call (630) 788-7167. D1513

VERMONT, US - Burlington: Beautiful Burlington, Vermont, is calling you! Established practice is seeking a dentist for a Monday through Friday work week. Full-time compensation includes: competitive salary, bonus potential and a full benefits package (including a 401K plan with matching funds). Part-time candidates will be considered. Positions also available in other states. For a position with a future call Brian Whitley, (800) 313-3863, ext. 2290 or e-mail bwhitley@affordablecare.com. D1604

VERMONT, US: Dentists and oral surgeons. Opportunities for general dentists in Rutland, Montpelier and Lake Champlain areas. Openings available for employment, private practice and practice acquisitions. Enjoy the splendor of the Green Mountains and Lake Champlain, all part of the unbeatable Vermont lifestyle. Contact: Lynn Harris, tel. (800) 288-1730, fax (518) 266-9289, e-mail lynnharris@harrisbrand.com. D1538

HONDURAS - Roatan, Bay Islands: Wanted - dentists to volunteer. Combine volunteer dentistry in a tropical paradise with scuba diving on the best reef in the Western Hemisphere. Please respond to: Peggy Stranges, e-mail peggystranges@yahoo.com D1599

30th ANNIVERSARY

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1974-2004

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ROI Corporation is the largest assembly of professionals who are dedicated to the Appraisal & Sale of your practice. If you are considering a strategic change within your practice, contact your ROI Corporation associate first. Over 3,000 of your colleagues have since 1974.

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The appraisal has become an essential tool for the practice owner. The appraisal will assist you, the purchaser, the bank, the accountants and the lawyers to make informed decisions. Practices are almost always sold with the aid of a professional, and comprehensive appraisal. Appraisals have a typical lifespan of 1 to 5 years.

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Canada wide we have dozens of practices for sale. Our team of 11 associates (5 of whom are dentists) is available for private consultations. We suggest that you make arrangements for an after-hours appointment so that we may better understand your practice, your future plans, or your unique circumstances.

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In the event of a sudden death or disability, it is important to have an appraisal with your valuable documents. Waiting for a complete appraisal to be performed in this time of need can decrease the sale price of your practice. Appraisals can be updated quickly at little or no cost. Call for a free copy of our Practice Preservation package.

Private Consultation

When you want to know how to exit dental practice ownership with dignity and profitably, call your ROI Corporation associate to arrange a private consultation. We have provided this service to thousands of your colleagues since 1974. When you are considering a strategic change within your practice, call ROI Corporation.

D1236

Vancouver	Alberta	Toronto	Ottawa	Montreal	Halifax
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SAIPAN - COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS: "Opportunity to live and work in paradise". Learn to scuba dive, wind surf and snorkel. Excellent location for children. Great private schools at affordable rates. Lower tax rates than Canada and U.S. Pay is in U.S. currency. Year-round climate of 78 to 85 degrees Fahrenheit. Laid-back island lifestyle. We are looking for an associate general dentist who has excellent chair-side manners, works well with families and children. Must be able to work with diverse cultures. Three years minimal experience. Must possess good endo, crown and bridge skills. Willing to see a minimum of 8 to 12 patients per day. New 4-operatory clinic with state-of-the-art equipment and fully computerized. After first year, potential partnership or profit sharing available. Full benefits and paid vacation included in package. Contact: Scot Thompson, Clinic Manager, PMB 807, PO Box 10001, Saipan, MP 96950; tel. (670) 233-1100, (670) 235-4577 (res.), fax (670) 233-2233, e-mail dentalcare@saipan.com or rod.stewart@saipan.com. Must send last three employer references. D1605

Professional Services

www.dentaljobs.ca: Dentists, dental hygienists, CDA's, and all other dental personnel interconnect here with long- and short-term jobs. Search for jobs and available personnel; list a vacancy or personal availability on this user-friendly Web site. Practice for sale and practice wanted ads also welcome. Basic single listings are free. D1603

Equipment Sales & Service

FOR SALE: Due to office closure: 3 deluxe Marus hydraulic chairs (upholstery in excellent condition), Adec pole lights, Belmont x-ray units, 2 Mardan file cabinets, 1 Kavo Klave sterilizer, Kerr Optilux light and much more. E-mail BMWilson@MHTV.CA for information. Prefer to sell large items as package deal. Will deliver within British Columbia and Alberta. D1609

Letters
Continued from page 664

and severe shortages in the public sector have led to an arrangement whereby dentists, from dental schools which used to be accredited by the U.K. General Dental Council, will be allowed entry to practise in the public sector in designated areas *without the need to sit and pass exams.* These dentists would have to practise where placed for 3 years and then sit and pass the clinical exam, which would free them to practise anywhere in Australia.

This new system has the potential, in my view, to completely undermine the exam system. If a dentist has practised for 3 years without mishap, equal opportunity laws would surely question the need to pass any more hurdles. Furthermore, if certain dentists can come into Australia under this scheme, why shouldn't dentists from other countries be allowed the same opportunity? In fact, the Australian Dental Council has now been given the job of assessing graduates from all other countries for such fast-tracking.

The Australian Dental Association welcomes suitably qualified dentists to this country, but it is also concerned about the morality of taking dentists from countries which desperately need them and are not as affluent as Australia. Australia can, and should, train sufficient dentists and allied dental personnel to remain self-sufficient in its oral health workforce.

Dr. David Houghton
President
Australian Dental Association

Reference

1. O'Keefe J. A profession on the move. *J Can Dent Assoc* 2004; 70(9):587.

Seeking Donations

I wanted to remind my colleagues across the country that I am still collecting used dental equipment, as well as sundries and supplies that they are no longer using, to donate to our dental colleagues in Cuba.

I am just one person trying to help out, so I cannot issue a tax receipt. Your donation is truly a gift. Remember, dentists in Cuba have the knowledge but lack the money to buy the technology.

As long as the equipment is in working condition and the sundries have not expired, everything is welcome. Items can be sent to my office at: 1435 St-Martin Blvd., Office #105, Laval, QC H7S 2C9.

Dr. Gerald P. Riley
Laval, Quebec
gerald.riley@sympatico.ca

Compliments to CDA "Watchdog"

It was certainly disheartening to read about the activities of Gilbert's Medical Dental Supplies in Dr. O'Keefe's September editorial[1]. I commend Dr. O'Keefe and CDA for their proactive stance and quick action to resolve this issue. It is encouraging to know that CDA represents ethical dentistry and stands behind Canadian dentists when "the going gets tough." This is an excellent example of our national organization looking after our best interests and acting as our much needed and respected "watchdog."

Dr. Elvine Yim Wun Jin
North York, Ontario

Reference

1. O'Keefe J. Let's not be fooled again. *J Can Dent Assoc* 2004; 70(8):507.

Next Generation Orthodontics

Hands-on Training, Clinical Results, Financial Success

Orthodontics provides a profitable way to enhance your client service and satisfaction

Proper training enables you to select the right cases and achieve both the clinical and financial success you desire

Taught by Certified Orthodontists

Next Generation Orthodontics provides Dentists with Comprehensive Training in Self-Ligation Techniques and Functional Orthodontics. Our program gives you the comprehensive information, hands-on training, and ongoing support required to confidently and successfully implement Orthodontics into your practice.

Next Generation Orthodontics offers an extensive program containing four levels of training. Each level is made up of courses running over a three day period. All our programs are given in the beautiful setting of the Rocky Mountains in Banff.

Our whole program has been developed around our belief that Dentists have both the ability and desire to enhance their level of patient service. Our goal is to equip Dentists with the knowledge and skills to provide their patients with the highest level of service and success in Orthodontics.

For further information, program schedules and to register,
Visit www.nextgenorthodontics.com Or phone 1-403-703-9250

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Listerine helps reduce and prevent the progression of gingivitis when used in a properly applied program of oral hygiene and dental care. CANADIAN DENTAL ASSOCIATION

Fluoride Listerine helps reduce and prevent the progression of gingivitis and prevents tooth decay when used in a properly applied program of oral hygiene and dental care. CANADIAN DENTAL ASSOCIATION

Listerine was shown to reduce interproximal gingivitis comparable to flossing†

† Gingivitis scores at interproximal sites were reduced 7.9% by brushing and rinsing with Listerine, vs. 8.3% by brushing and flossing ($p<0.001$ vs. control group) in a 6-month Canadian study meeting CDA guidelines. Patients (n=297) with mild-to-moderate gingivitis were randomized in three treatment groups. Plaque and gingivitis were scored at baseline, 3 months & 6 months. Diaries used to track oral hygiene and compliance assessments done monthly.[1]

1. Sharma, N.C. et al, Comparative effectiveness of an essential oil mouthrinse and dental floss in controlling interproximal gingivitis and plaque. American Journal of Dentistry 2002.

Indications: *Listerine Antigingivitis-Antiplaque-Antiseptic-Antitartar-Anticaries oral rinses* kill the germs that cause gingivitis, plaque and bad breath. Tartar Control fights tartar build-up better than brushing alone (when compared to regular toothpaste). Fluoride Listerine prevents caries.

Cautions: Keep out of reach of children. Do not swallow. In case of accidental ingestion, contact a Poison Control Centre or doctor immediately.

Dosage: Adults and Children 12 years and older: Listerine Antiseptic Mouthwash: Rinse full strength with 20 mL for 30 seconds twice a day; gargle to relieve sore throats due to colds. Tartar Control: Twice daily, brush with your regular toothpaste for 1 minute, rinse with water then rinse full strength with 20 mL Tartar Control Listerine for 30 seconds; Fluoride Listerine: Rinse full strength with 20 mL for 30 seconds twice a day. Do not eat or drink for 30 minutes after use. **Medicinal Ingredients:** All Listerine products contain eucalyptol 0.091% w/v, thymol 0.063% w/v, menthol 0.042% w/v. Tartar Control Listerine also contains zinc chloride 0.09% w/v. Fluoride Listerine also contains sodium fluoride 0.022% w/v. **Non-medicinal Ingredients:** All Listerine products contain alcohol, benzoic acid, methyl salicylate, poloxamer, sodium benzoate, water. Original Listerine also contains caramel. All others also contain flavour, propanol, saccharin sodium, sorbitol. Cool Mint Listerine contains FD&C green No. 3. Fresh Burst Listerine and Fluoride Listerine contain D&C yellow No. 10, FD&C green No. 3. Tartar Control contains FD&C blue No. 1. **NOTE:** Cold temperatures may cloud this product; its efficacy will not be affected. **SUPPLIED:** Bottles of 250, 500, 1000 and 1500 mL (no 500 mL for Fluoride).

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