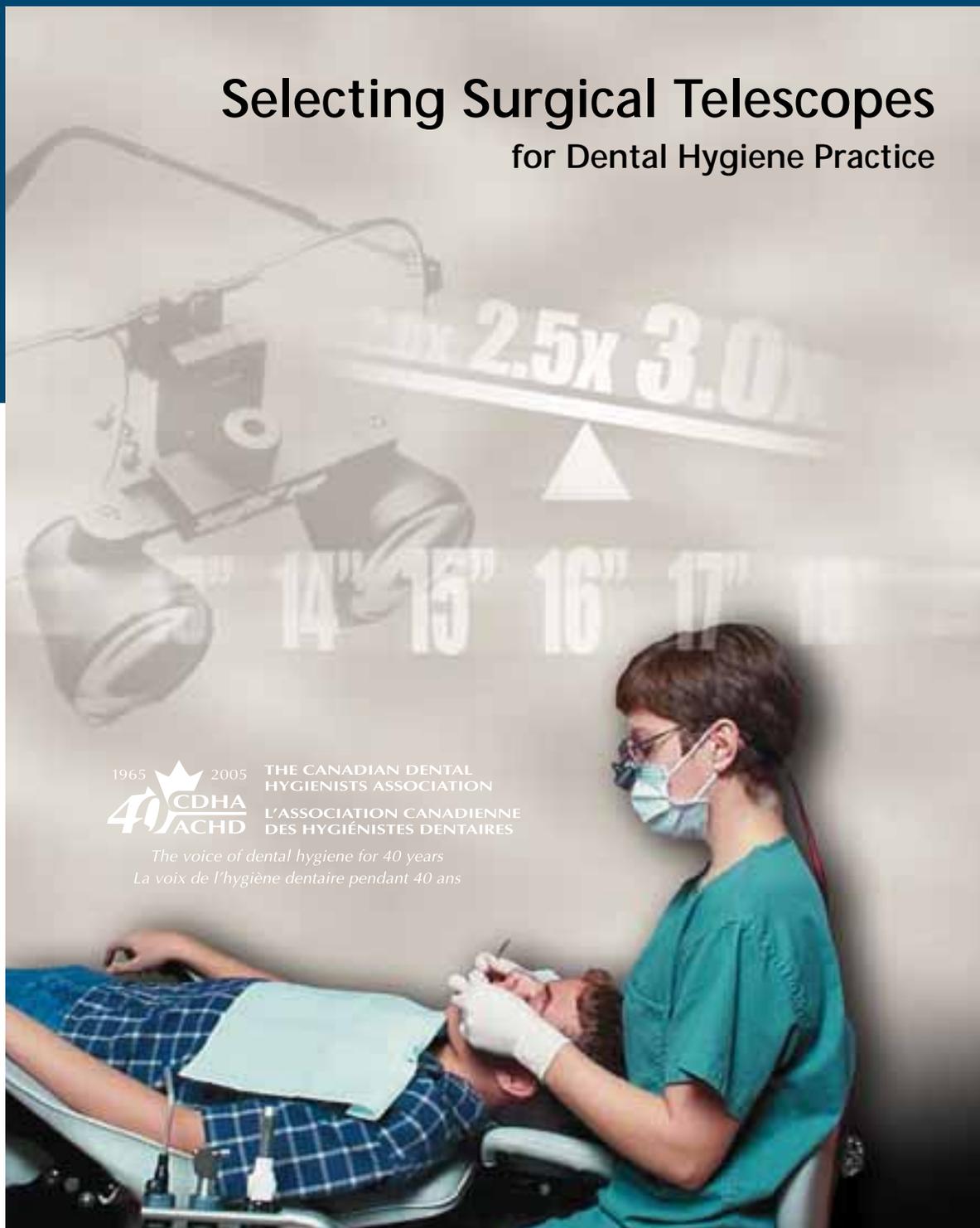


CJDH JCHD

MARCH – APRIL 2005, VOL. 39, NO. 2

Selecting Surgical Telescopes for Dental Hygiene Practice



THE CANADIAN DENTAL
HYGIENISTS ASSOCIATION
L'ASSOCIATION CANADIENNE
DES HYGIÉNISTES DENTAIRE

*The voice of dental hygiene for 40 years
La voix de l'hygiène dentaire pendant 40 ans*

Caring for Each Other

by Patty Wickstrom

THE WORLD HAS EXPERIENCED SOME horrific events over the past few months. One cannot help but be affected by the tragedies resulting from the tsunami that rocked the world. As we watch in horror the incredible destruction and loss of life, we look more closely at what we have near at hand. The people we hold dear become even more precious. The world can be proud how all countries rushed forward to help.

But in the face of the tragedy in Southeast Asia, we must not lose sight of what is happening on an ongoing basis here in our own country. There is a constant increase in the number of homeless, jobless, and working poor in Canada. They struggle every day to provide many necessities such as food for themselves and their families and warm shelter for the night. Winter is especially difficult.

We must convince governments of the vital role that dental hygienists play in the treatment and prevention of oral health conditions

Then, as well, there can be a vicious circle with their health. With inadequate living conditions and nutrition comes overall ill health, which affects their oral health. Poor oral health then contributes back to the existing poor overall health. A majority of this population lacks access to the necessary health care or oral health care because of financial barriers, transportation issues, or geographical barriers.

As Canadians and dental hygienists, we have a responsibility to assist those in need. We must convince governments of the vital role that dental hygienists play in the treatment and prevention of oral health conditions. Prevention is a key element for a healthier nation. In preventing major diseases, good oral health will ultimately reduce the overall health care costs. Dental hygienists are perfectly situated to provide the care that will help prevent oral health conditions.

I am proud to be a citizen of a nation that donated over \$150 million for tsunami aid and a fellow-citizen of the hundreds of people who have volunteered their time and services to aid the victims of this disaster.

Caring for Each Other ...continued on page 66



L'entraide

par Patty Wickstrom

LE MONDE A CONNU QUELQUES ÉVÉNEMENTS terrifiants ces derniers mois. Nous ne pouvons pas faire autrement que d'être touchés par les tragédies découlant du tsunami qui a ébranlé la planète. L'observation horrifiante des invraisemblables destructions et pertes de vie nous amène à regarder de plus près ce que nous avons à portée de la main. Les êtres qui nous sont chers deviennent encore plus précieux. L'humanité peut être fière de la manière dont les pays se sont tous précipités pour acheminer de l'aide.

Mais, malgré la tragédie survenue en Asie du Sud, nous ne devons pas perdre de vue ce qui se produit de façon continue dans notre propre pays. Le nombre de sans-abri, de chômeurs et de petits salariés est en hausse constante au Canada. Ces personnes mènent un combat quotidien pour se procurer les nombreuses nécessités de la vie – de la nourriture pour elles-mêmes et leur famille et un abri chaud pour la nuit, par exemple. L'hiver est particulièrement pénible.

Il nous faut convaincre les gouvernements du rôle essentiel que jouent les hygiénistes dentaires dans le traitement et la prévention des problèmes de santé bucco-dentaire

Ensuite, il peut aussi y avoir un cercle vicieux en ce qui a trait à leur santé. À cause de conditions de vie et d'une alimentation inadéquates, leur état de santé général se dégrade, ce qui a des effets sur leur santé bucco-dentaire. La mauvaise santé bucco-dentaire contribue alors à son tour au mauvais état de santé général déjà existant. La majorité de cette population n'a pas accès aux soins de santé ou de santé bucco-dentaire nécessaires, en raison d'obstacles financiers, de problèmes de transport ou de barrières géographiques.

À titre de Canadiennes et de Canadiens et d'hygiénistes dentaires, nous avons la responsabilité de venir en aide aux personnes dans le besoin. Il nous faut convaincre les gouvernements du rôle essentiel que jouent les hygiénistes dentaires dans le traitement et la prévention des problèmes de santé bucco-dentaire. La prévention constitue un élément clé de l'amélioration de la santé de la population du pays. En prévenant les maladies importantes, la bonne santé bucco-dentaire finira par réduire les coûts de santé

L'entraide ...suite page 66

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La voix de l'hygiène dentaire pendant 40 ans

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Of Listening and Ethics

by Susan Ziebarth, BSc, MHA, CHE



Good company and good discourse are the very sinews of virtue.

– Izaak Walton in *The Compleat Angler*
(first published 1653)

CDHA'S MISSION IS TO BE *THE COLLECTIVE VOICE AND vision of dental hygienists in Canada, advancing the profession, supporting its members, and contributing to the oral health and general well-being of the public.* To create a voice, we must listen. Our birthday festivities have been providing us with an opportunity to hear your voices on various topics every month. Thank you for participating and thank you to our sponsors for providing the collection of monthly prizes. Part of a healthy association is the ability to engage in a discourse and learn from one another. Our last issue of the journal has given us two such opportunities upon which to build.

Part of a healthy association is the ability to engage in a discourse and learn from one another

Lorraine J. Assmus suggested that "For our 40th birthday, 'dental hygienists' deserve an... Extreme Name Makeover!" Lorraine certainly captured the attention of many of our readers who agreed or disagreed with her and some have suggested new names for the profession. A selection of the replies to the article is included in this issue.

Also in our last issue was a Letter to the Editor from Anita Vallée, asking that CDHA discontinue an advertisement for a non-fluoridated toothpaste. Ms. Vallée believed that supporting the ad was in conflict with CDHA's position on fluoride. This issue has sparked a very healthy discussion within the association at the same time, coincidentally, as the issue of fluoride has been a top subject on the Canadian Association of Public Health Dentistry listserv. The response from the journal editor to Ms. Vallée was not well received. A follow-up letter to the CDHA arrived at the end of 2004 with Ms. Vallée representing the British Columbia Dental Public Health Committee. The Committee expressed concern about "the ethical issue of advertising a product that is contrary to the

Questions d'écoute et de déontologie

par Susan Ziebarth, B.Sc., M.H.A., C.H.E.

La bonne compagnie et la bonne conversation sont justement les points d'appui de la vertu.

– Izaak Walton, dans *The Compleat Angler*
(paru pour la première fois en 1653)

L'ACHD A POUR MISSION D'ÊTRE *LA VOIX ET LA VISION collectives des hygiénistes dentaires au Canada, en faisant progresser la profession, en appuyant ses membres et en contribuant à la santé bucco-dentaire et au bien-être général du public.* Or pour créer une voix, il nous faut écouter. Les festivités entourant notre anniversaire nous ont donné l'occasion d'entendre chaque mois votre opinion sur divers sujets. Merci de votre participation et merci à nos commanditaires de nous offrir l'ensemble de prix mensuels. La capacité de s'engager dans un échange d'idées et d'apprendre les uns des autres constitue un élément de la vitalité d'une association. Le dernier numéro de notre journal nous a fourni deux occasions de ce genre à mettre à profit.

Selon Lorraine J. Assmus, pour leur quarantième anniversaire, les « hygiénistes dentaires » méritent un changement de nom radical. Lorraine a certainement retenu l'attention de bon nombre de nos lectrices et de nos lecteurs qui partagent ou non son avis. Certains ont d'ailleurs suggéré de nouveaux noms pour la profession. On trouvera dans ce numéro un choix de réponses à son article.

La capacité de s'engager dans un échange d'idées et d'apprendre les uns des autres constitue un élément de la vitalité d'une association

Notre dernier numéro contenait aussi une lettre à la rédaction provenant d'Anita Vallée; celle-ci demande à l'ACHD de cesser de faire paraître une annonce de dentifrice non fluoré. M^{me} Vallée estime que le fait d'appuyer cette publicité entre en conflit avec la position de l'ACHD sur la fluoruration. Cette question a suscité une discussion très saine au sein de l'Association au moment même où, par coïncidence, la fluoruration figure parmi les principaux sujets abordés sur le serveur de liste de l'Association canadienne de santé dentaire publique. La

Of Listening and Ethics ...continued on page 52

Questions d'écoute et de déontologie ...suite page 52

CDHA's policy statements, and thus [bringing] into question the integrity of the organisation as perceived by the members." As a result of Ms. Vallée's first letter, CDHA began a process of reviewing our industry relations policies. After receipt of the second letter, we engaged Dr. Michael Yeo, an ethicist, to provide assistance with this particular issue and with the broader policy issue. The dissonance between the CDHA's position on fluoride and the advertisement is of serious concern to CDHA and therefore the ad has been discontinued. We wish to thank Ms. Vallée for bringing the concern forward as CDHA strives always to act in a professional and responsible manner.

*CDHA strives always
to act in a professional
and responsible manner*

The issue of fluoride will continue to receive attention in the coming months as CDHA prepares to review "The Fluoride Dialogue: CDHA Position Statements." (This was published in the November/December 2002 issue of *Probe*

and is available on the members' only section of the website—Policy & Action, Policy Statements.) The CDHA fluoride position statements note that research is needed in developing an improved method for determining the optimal fluoride concentration in community drinking water, a method that takes into account other sources of fluoride from air, food, and dental products. This research is actually now underway at the U.S. Environmental Protection Agency (EPA). In May 2005, the EPA will be publishing the "Toxicologic Risk of Fluoride in Drinking Water" report. This report will review toxicologic, epidemiologic, and clinical data, plus exposure data on orally ingested fluoride from drinking water and other sources (e.g., food, toothpaste, dental rinses). Based on those reviews, an evaluation will be made of EPA's maximum contaminant level goal of 4 milligrams per litre. This new information will assist the EPA in protecting children and others from adverse effects. We will be consulting this report during the review of our "Fluoride Dialogue."

We invite you to add your voice to the review process of the revised CDHA fluoride document when it is posted on the members' website. If you do not have on-line access, please contact us to let us know that you would like to receive a draft for review when it is ready. Watch your twice-monthly e-mails from CDHA for more details. 

Questions d'écoute et de déontologie (suite de la page 51)

réponse de la directrice de la rédaction du journal n'a pas obtenu un bon accueil. L'ACHD a reçu une lettre de suivi à la fin de 2004, dans laquelle M^{me} Vallée représente le British Columbia Dental Public Health Committee. Le Comité y exprime son inquiétude au sujet « du problème d'éthique que pose la publicité d'un produit qui va à l'encontre des énoncés de principes de l'ACHD, ce qui, par conséquent, remet en question l'intégrité de l'organisme aux yeux de ses membres ». À la suite de la première lettre de M^{me} Vallée, l'Association a amorcé la révision de ses politiques relatives aux relations avec l'industrie. Après réception de la deuxième lettre, elle a engagé un éthicien, M. Michael Yeo, pour lui venir en aide dans ce dossier précis et en ce qui a trait à la question des politiques dans l'ensemble. La discordance entre la position de l'ACHD à propos de la fluoruration et l'annonce publicitaire constitue un sujet de préoccupation important pour l'Association; aussi l'annonce a-t-elle été retirée. Nous tenons à remercier M^{me} Vallée d'avoir soulevé le problème, étant donné que l'ACHD s'efforce toujours d'agir de manière professionnelle et responsable.

La question de la fluoruration continuera de retenir l'attention dans les mois à venir, puisque l'ACHD se prépare à revoir ses énoncés de principes (« The Fluoride Dialogue : CDHA Position Statements »). (Ce document a été publié dans le numéro de novembre-décembre 2002 de *Probe*; on peut le trouver sur le site Web, dans la section réservée aux membres, à la rubrique Policy & Action, Policy Statements.) Comme l'indique l'ACHD dans ses

énoncés de principes au sujet de la fluoruration, il faut effectuer des recherches pour définir une méthode améliorée qui permettra de déterminer la concentration optimale de fluorure dans l'eau potable des collectivités; cette méthode devra tenir compte des autres sources de fluorure dans l'air, les aliments et les produits dentaires. La recherche à ce sujet est actuellement en cours à l'Agence de protection de l'environnement des États-Unis, l'EPA. En mai 2005, l'EPA publiera un rapport sur le risque toxicologique que présente la fluoruration de l'eau potable. Ce rapport passera en revue des données toxicologiques, épidémiologiques et cliniques ainsi que des données sur l'exposition au fluorure dans l'eau potable et d'autres sources (la nourriture, les dentifrices et les rince-bouche) ingéré par voie orale. Ces examens serviront de point de départ à une évaluation de l'objectif visé par l'EPA, soit un niveau maximal de contaminants de quatre milligrammes par litre. Ces renseignements nouveaux aideront l'EPA à protéger les enfants, entre autres, contre des effets néfastes. Nous consulterons ce rapport au cours de la révision de notre dialogue sur la fluoruration.

Nous vous invitons à ajouter votre voix au processus d'examen du document révisé de l'ACHD à propos de la fluoruration après qu'il aura été posté sur le site Web, dans la section réservée aux membres. Si vous n'avez pas l'accès en ligne, veuillez communiquer avec nous pour nous faire savoir que vous aimeriez recevoir la version préliminaire du document quand elle sera prête, afin de l'étudier. Surveillez vos courriels bimensuels de l'ACHD pour plus de précisions. 

Extreme Name Makeover! Reactions...

IN THE JANUARY-FEBRUARY ISSUE OF THE CJDH, the “Your Opinion” article by Lorraine Assmus dealt with dental hygienists deserving a new name to celebrate the 40th anniversary of the profession. Comments and suggestions were encouraged and we did get some!

Dwight Bungay of Alberta says he has always found the term “dental hygienist” to be female oriented and would welcome a change (although he does stress he means no disrespect to the female dental hygienists with this remark!). His suggestion: Periodontal therapist. **Shelly Propp**, also of Alberta, agreed with the need for a change, for a name with more clout. While willing to help in the search for a new name, Shelly is keeping her choices quiet. Yvette Wilson also would like something more “public friendly.” An **Ontario dental hygienist** has a rather thought-provoking name: as the mouth is the gateway or portal to the body, she suggested a name that incorporated the “portal” idea: Portodontist! A **dental hygiene student** at Confederation College, has suggested Registered Oral Health Promotionist.

So far, the responses were positive with some serious or not-so-serious suggestions. However, **Margit Juhasz** was quite taken aback by the whole idea. She wrote in, strongly supporting the term “dental hygienist” as have the dental hygienist colleagues with whom she consulted. She says the title has *weight* and that the public know who we are and what we do. Margit lists the many bigger challenges the profession faces and says we should concentrate on more important items. She says that “Registered” in Registered Dental Hygienist has a wealth of meaning and can be worn with pride and confidence. An impassioned defence of both the current name and of the profession.

Selecting Surgical Telescopes for Dental Hygiene Practice

by Susanne Sunell,* BA, DipDH, MA, EdD, and Lance Rucker,† AB, BDS, DDS, FACD

ABSTRACT

The use of surgical magnification has the potential to increase the quality of dental hygiene clinical care and to support the musculoskeletal health of dental hygienists. However, dental hygienists need to understand the characteristics of magnification systems to make an informed choice regarding their integration into practice. **Approach to product evaluation:** In 1995 Dr. Lance Rucker established the Surgical Telescope Evaluation Program (STEP) that includes an interdisciplinary team of professionals (n=7) to assess the characteristics of surgical telescopes for dental clinicians. To date, 23 surgical telescopes have been evaluated. The data collected include characteristics such as weight and declination angles as well as clinical observations based on a formal assessment process. **Analysis of products:** There are a variety of systems that can meet dental hygienists' needs. However, clinicians must first determine their optimal working position that supports their musculoskeletal health and then select magnification systems that will support that position. The working distance, depth of field, coaxial alignment, and optical declination angle of the chosen magnification system must correspond to the musculoskeletal needs of the clinician. Decisions regarding other characteristics such as weight, level of magnification, and width of view are based on the clinicians' individual preferences. **Conclusion:** Surgical telescopes, by themselves, are not a cure for the musculoskeletal problems experienced by dental hygienists. Improperly selected or adjusted telescopes can promote positions that place clinicians at increased risk for such problems. Like all equipment, surgical telescopes need to be carefully assessed.

Key words: ergonomics, dental hygienists, dental equipment, lenses

INTRODUCTION

In spite of advances in engineering and design, as well as the benefits of new operatory layouts and general technological advances, dental hygienists and dentists continue to have a high risk of experiencing a variety of musculoskeletal symptoms. In many cases, they attribute these symptoms, in whole or in part, to clinical care.¹⁻¹⁰ Our best efforts at ergonomics education for young clinicians and a careful application of clinical ergonomics principles have seemingly gone unrewarded in helping dental clinicians control the relationship between their physical work environment and their musculoskeletal health.

Surgical magnification is one of the areas in which the technical advances have been particularly well demonstrated for their potential to contribute to the musculoskeletal health of dental hygienists. Surgical magnification has been routinely used in medicine since the 1920s.¹¹ Recently, all Canadian faculties of dentistry have integrated surgical telescopes to some extent and dental hygiene educators are expressing increased interest in assessing their value for dental hygiene care.

With the advancement in materials and design, there are now a variety of systems from which to choose. It is often challenging for clinicians to make an informed choice when presented with so many options. Which are critical features of a system and which characteristics are related to individual preferences? An exploration of these issues was considered integral to making an informed decision about surgical magnification.

* Dental hygiene educator with Vancouver Community College (VCC); educational and ergonomic consultant whose practice includes ergonomic assessments and rehabilitation. During her term as Department Head of the Dental Hygiene Program at VCC, she was responsible for the integration of surgical ergonomics into that program in 1990. She is currently involved in the evaluation of surgical magnification systems through the Surgical Telescope Evaluation Program at the University of British Columbia. Contact e-mail: <ssunell@idmail.com>.

† Director of Clinical Simulation at the Faculty of Dentistry of the University of British Columbia. He has pioneered ergonomic use of dental surgical telescopes, designed equipment layouts to improve ergonomic safety for dental hygienists, and has been an equipment evaluation consultant for major dental equipment manufacturers. He is Councilor and co-founder of the Clinical Simulation Section of the American Dental Education Association. In his private consulting practice, Dr. Rucker works with dental clinics to ensure that they are laid out and used in ways that put dental professionals at minimum risk for work-related pain. <author@lancerucker.com>

ASSESSING THE EVIDENCE

The literature related to surgical magnification includes many opinion papers in which the authors describe different systems and their associated benefits.¹²⁻¹⁵ Actual studies on the subject are few, particularly in the dental hygiene area. The studies that exist focus on two areas: quality of care and improved ergonomics.

Many authors suggest that the use of surgical magnification will provide greater visual acuity and motor control as well as improved diagnostic and treatment outcomes.¹³⁻¹⁹ In an American survey of endodontists (n=2061), 52% of the respondents used surgical magnification with many

stating that it was a valuable addition to their practice.²⁰ However, the evidence that it improves care is ambiguous. Whitehead and Wilson²¹ found that clinicians using surgical magnification tended to make more decisions to restore and replace restorations compared with those who used normal vision ($p=.05$). It is challenging to know what these results actually mean when thinking about the issue of over-treatment and appropriate treatment. However, Zaugg et al.²² found that dentists using surgical telescopes spent less time examining the 37 phantom-mounted models but found more defects than their colleagues who used no magnification ($p=.5$). This study included three groups of 13 dentists each, including groups with unaided vision, surgical telescopes, and microscopes.

While the above evidence is limited, one could argue that increased visual acuity would be important for diagnostic abilities. Clovis²³ argues that one of our most important responsibilities as dental hygienists relates to our assessment of extra- and intra-oral tissues. This is particularly important for the early detection of oral cancers. It could be argued that surgical magnification would assist us in a variety of assessments including the analysis of tissue characteristics and the measurement of periodontal pockets as well as attachment loss.

Research has also been conducted in the area of treatment outcomes, but again the evidence is ambiguous. Leknius and Geissberger¹¹ found a statistically significant difference when studying dental students trimming dies in laboratory and clinical simulation settings. When working with surgical magnification, the students made fewer errors than when working with normal vision ($p > .001$). However, Donaldson et al.²⁴ studied dental students and found no statistically significant differences in pediatric amalgam preparations. These authors did question their methodology and suggested that perhaps the degree of dif-

The study participants all favoured the use of surgical magnification.

ficulty of the Class 2 preparation was not high enough to discriminate between the students' abilities, and that their 3-point rating scale may not have been sensitive enough to find a difference if one existed.

Other studies have included experienced clinicians working in simulation settings. Lussi et al.²⁵ investigated Class 2 preparations with nine experienced clinicians and assessed adjacent surfaces ($n=72$) for iatrogenic damage. When combining the data for the mesial and distal surfaces, no statistically significant difference were found. When comparing only the distal surface, more damage was observed in the preparations that had been performed with magnification ($p=.05$). Forgie et al.²⁶ assessed differences in cavity size with four experienced clinicians performing multiple restoration on extracted teeth ($n=76$). They found the preparations cut with surgical magnification to be smaller when compared with those performed with unaided vision, but the differences were not statistically significant. These authors, however, suggest that their outcomes were clinically significant even though not statistically significant. They considered the cumulative removal of tooth structure over the years to be important. The study participants all favoured the use of surgical magnification. The small number of participants involved in these studies limits the likelihood of finding significant differences even if differences do exist. Given all the other competing priorities for research dollars, it is unlikely that larger studies will be conducted in this area.

While vision is important for dental care, the importance of tactile sensitivity and proprioception also needs to be acknowledged.^{20,24,27} These variables may be particu-

RÉSUMÉ

Le recours au grossissement chirurgical offre la possibilité d'accroître la qualité des soins cliniques d'hygiène dentaire; il permet aussi de favoriser la santé musculosquelettique des hygiénistes dentaires. Il faut cependant que les hygiénistes dentaires comprennent les caractéristiques des systèmes de grossissement afin de faire un choix éclairé en ce qui a trait à leur intégration dans la pratique. **Façon d'envisager l'évaluation de produits** : En 1995, le Dr Lance Rucker a mis sur pied le Surgical Telescope Evaluation Program (STEP) [programme d'évaluation du télescope chirurgical]; celui-ci comprend une équipe interdisciplinaire formée de sept professionnels chargés d'évaluer les caractéristiques des télescopes chirurgicaux à l'intention des cliniciens dentaires. Jusqu'à présent, 23 télescopes ont été évalués. Les données recueillies incluent des caractéristiques telles que le poids et la déclinaison ainsi que des observations cliniques fondées sur un processus d'évaluation en bonne et due forme. **Analyse des produits** : Il existe divers systèmes en mesure de répondre aux besoins des hygiénistes dentaires. Toutefois, les cliniciens doivent d'abord déterminer leur position de travail optimale – celle qui favorise leur santé musculosquelettique – avant de choisir les systèmes de grossissement qui favoriseront cette position. La distance de travail, la profondeur du champ, l'alignement coaxial et la déclinaison optique du système de grossissement retenu doivent correspondre aux besoins musculosquelettiques de la clinicienne ou du clinicien. Les décisions à propos des autres caractéristiques – le poids, le degré de grossissement et la largeur de vue, par exemple – sont basées sur les préférences personnelles de la clinicienne ou du clinicien. **Conclusion** : Les télescopes chirurgicaux ne sont pas, en soi, une solution aux problèmes musculosquelettiques des hygiénistes dentaires. S'ils sont mal choisis ou mal ajustés, les télescopes peuvent favoriser des postures qui augmentent le risque que la clinicienne ou le clinicien éprouve des problèmes de ce genre. Comme tout matériel, les télescopes chirurgicaux doivent être évalués soigneusement.

Mots clés : ergonomie, hygiénistes dentaires, matériel dentaire, lentilles

The magnification system must not force clinicians to compromise their optimal working position.

larly important for the outcomes of dental hygiene care, given our focus on periodontal debridement. It is challenging to assess the importance of surgical magnification for the outcomes of dental hygiene care. It appears to be intuitively logical that assessment and diagnostic aspects of dental hygiene care could be supported with surgical magnification but its effect on the quality of dental hygiene services has yet to be substantiated. And it probably will not be investigated, given that we do not even have substantive information about the outcomes of dental hygiene care in general, let alone with and without surgical magnification.

The most convincing argument for the integration of surgical magnification relates to its effect on the musculoskeletal health of clinicians. The physical health benefits of surgical magnification for dental hygienists were first reported in a qualitative study at Vancouver Community College (VCC)²⁸ that involved dental hygiene students and clinical educators (n=25). The study participants reported enhanced vision; decreased time leaning forward; decreased eye fatigue; and decreased neck, back, and shoulder problems. A recent survey of dental students (n=128) conducted by Hagge,²⁹ revealed that 21% of the participants purchased surgical telescopes for ergonomic factors. Hagge also noted that clinicians not using surgical magnification often lean forward and compromise their balanced positions. This is indicative of the difference between a clinician's musculoskeletal preference and their visual preference. Clinicians create their own magnification by leaning forward to achieve it, but these positions are not conducive to musculoskeletal health.^{9,10}

This was followed by a larger study conducted in 1999 to assess the musculoskeletal health and practice patterns of British Columbia dental hygienists.¹⁰ Fifteen per cent of the respondents (n=170) used surgical telescope systems and they reported a lower incidence of musculoskeletal problems in the lower back area ($p<.001$). However, several other equipment and positioning variables were also correlated with problems in this and other areas.

While there is evidence that surgical magnification systems have the potential to support the musculoskeletal health of dental hygienists, their integration is not an independent or sole solution for imbalanced position. Clinicians must first determine their balanced musculoskeletal position for providing care before making decisions about surgical magnification systems.

Such a balanced position can be best determined by sitting in free space (not leaning against the backrest), closing the eyes, and relaxing all the muscles. Clinicians then need to explore the options for chair height, neck inclination, and arm height. By carefully focusing on internal feedback, clinicians can determine their most balanced and comfortable working position (see figure 1). This is the position that they should use when selecting a telescope



Figure 1. Self-derived balanced position (reprinted with permission from Sunell and Rucker, *Int J Dent Hygiene* 2004;2[1])

system.^{30,31} While it appears that appropriately selected and adjusted magnification can help to support balanced posture,³² poorly selected or adjusted systems can actually promote positions that place clinicians at increased risk for problems. The magnification system must not force clinicians to compromise their optimal working position. As with all equipment in the operator, surgical telescopes must be adapted to the needs of clinicians, not the other way round.³³

APPROACH TO PRODUCT EVALUATION

The Surgical Telescope Evaluation Program (STEP) was established as a resource centre for ergonomic researchers and dental clinicians to (1) analyze data related to existing surgical magnification devices and related equipment; (2) provide design specifications to manufacturers for new devices and equipment; and (3) provide evaluations and analyses to manufacturers for their surgical telescope equipment. The program began in the fall of 1995 and is based in the Clinical Simulation Laboratory at the University of British Columbia

The Program currently has an interdisciplinary team of professionals (n=7). Team members have included ophthalmologists, optometrists, opticians, dental hygienists, dentists, and dental students. Manufacturers provide samples to be assessed and the products are evaluated by one or more clinicians depending on the adjustability of the product. In the case of flip-up products (see figures 2 and 3), several clinicians have the opportunity to assess the product. However, through-the-lens (TTL) systems (see figure 4) are specifically measured for an individual clinician.



Figure 2. Spectacles-mounted, flip-up telescopes with vertical adjustability
(reprinted with permission from Sunell and Rucker, Int J Dent Hygiene 2004;2[1])



Figure 3. Headband-mounted telescopes

The assessment of products involves the evaluation of manufacturer-provided information, laboratory measures, and user commentaries. The analysis includes specific characteristics such as weight, working distance, field of view, declination angle, adjustability, magnification and convergence angle, as well as clinical observations based on a formal assessment process. Below, we provide data related to characteristics, ergonomic positioning, and preference issues for surgical telescopes (also commonly called “loupes”). The number of people involved in the STEP product evaluations is necessarily small, but this limitation has been balanced by the inter-professional scope of the assessments. The data below are translated into guidelines that allow clinicians to make informed decisions about current and future products.

The weight of the systems has decreased substantially.

ANALYSIS OF PRODUCTS

To date, 23 types of surgical telescopes have been evaluated from 6 different manufacturers. They have included the following:

- 7 fixed spectacles-mounted (through-the-lens) systems
- 16 flip-up systems (11 spectacles-mounted; 5 headband mounted)

The optical systems included both Galilean and Keplerian optics. In general, the quality of the optics of the lens systems provided by the major manufacturers of surgical telescopes (SurgiTel, Design-for-Vision, Keeler, Orascoptic, and Heine) has been comparable. The major differences among products have related to the ergonomics of the carrier technology (the attachment mechanism that orients those lenses to the face and eyes of the clinicians) so that the lens systems are in harmony with the musculoskeletal requirements of each user.

Weight of system

The weight of the systems has decreased substantially. Through-the lens (TTL) telescopes originally were the lighter-weight systems. In 1995, the total weight of the most commonly used telescopes ranged from 72–85 grams for the TTL systems and 80–105 grams for flip-ups. However, with improved technology and lighter-weight housing materials, the weight of the flip-up telescopes is now often comparable to the TTL systems. More recent products range from 65–85 grams in weight.

The physical weight of the system is often a less important factor contributing to the sense of “heaviness” that the user experiences than are the retaining systems offered (head straps, retaining lanyards, etc.) and the location and design of the nosepieces. The comfort afforded by these retaining systems is highly subjective. It includes a broad range of specialized technology from different manufacturers aimed at increasing the stability, security, and comfort for the wide range of clinical users with varying skeletal structures for the nose, face, and head. For example, SurgiTel has developed and patented a frame design in which the nose-pads are especially intended to support their telescopes for several Asian facial structural types. These frames have been highly acclaimed for their comfort by many non-Asian clinicians as well.

Magnification

The magnification of spectacles-mounted and head-mounted systems ranges from 2.0x to 5.5x, with 2.5x being one of the more common magnifications used in dentistry. In general, the higher the magnification, the smaller the actual field of view and the heavier the system. Higher magnification also reduces the depth of field, the distance through which the particular area remains in focus, as well as the light available for vision.



Figure 4. Spectacles-mounted, through-the-lens telescopes
(reprinted with permission from Sunell and Rucker, *Int J Dent Hygiene* 2004;2[1])

Working distance and depth of field

The working distance is the distance between the clinician's eyes and the working site. This measurement is related to the depth of field, which refers to the range over which the clinician is able to see clearly. There are two approaches to measuring the depth of field. It can be recorded in terms of the nearest and furthest extremes of distance from the surface of the eye to the object observed (for example, from 14" to 17"). It may also be measured in terms of the difference between these extremes (for example, a 3" depth of field as in the above example). Manufacturers often document parameters for their products based on these characteristics, but their information is dependent on their assessment approach. The working distance and depth of field provided by a system will depend on the vision of the clinician.^{31,32}

Optical declination angle

The optical declination angle reflects the angle at which clinicians decline their eyes when positioned in their optimal working position (see figure 5). Clinicians can assess this characteristic by first positioning themselves in their optimal working position with eyes closed, and then opening their eyes to determine if the telescopes they are wearing match their optical declination angle. However, this method can be used only when assessing flip-up systems. For TTL systems, an individual's declination must be measured with a protractor device to ensure that the lenses are mounted to meet the clinicians' optimal working position.

Companies vary in their commitment to declination angles for TTL systems. Some sales people have measuring devices and some do not. Some will suggest an appropriate declination angle for you, but this may not necessarily match your optimal balanced positioning. Most manufacturers' sales representatives we have encountered will measure clients' interpupillary distance prior to ordering TTL systems. The client information is then sent to the manufacturer. The accuracy of the initial measurements and the setting of the lenses to those specifications are crit-

ical with TTL systems. It is important to confirm the accuracy of the declination angle when the telescopes are shipped. We have frequently encountered errors that at best compromise the clinician's posture and positioning and at worst, render the telescopes unusable.

With all surgical telescopes, the determination of the optical declination angle is critical in selecting a system that supports operator comfort and balance. When clinicians are forced to change their preferred position, they tend to feel uncomfortable. If they continue working with such a system, they may experience eye strain and/or muscle strain of the head, neck, and back.



Figure 5. Optical declination angle (reprinted with permission from Sunell and Rucker, *Int J Dent Hygiene* 2004;2[1])

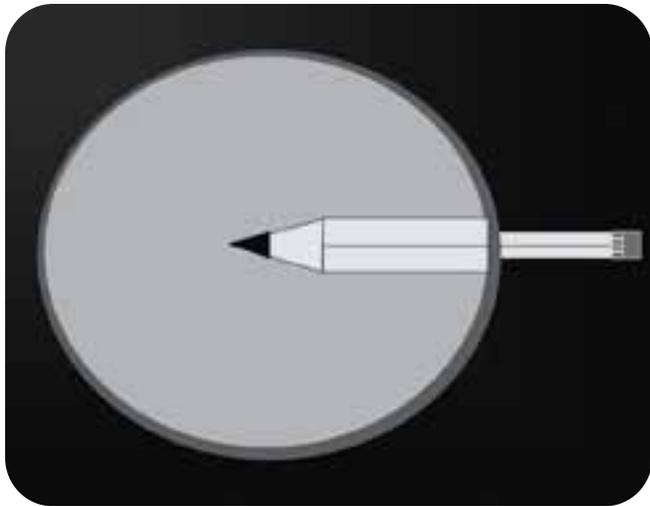


Figure 6. Coaxial viewing

Coaxial alignment

Coaxial alignment is another important feature to assess. When telescopes are not in perfect alignment (coaxial) with the clinicians' sightline, clinicians will experience a diffraction effect. To evaluate this effect, clinicians can pass a straight instrument from the unmagnified field (moving from either the right or the left side) toward the centre of the magnified field. The clinician can then observe whether the point of the instrument goes directly to the centre of the field (see figure 6) or whether it passes below or above the centre (see figure 7). If it passes above or below, diffraction has occurred. This poses a real problem, given that the position of the observed object and the real object will be different. A diffraction effect can also manifest as colour aberrations (for example, purple or yellow halos around lines, points, or margins in the magnified field). Both of these manifestations need to be avoided or corrected as they can be very troublesome for clinicians.³¹

Magnification scatoma

Instruments will cross through a blind zone, known as a magnification scatoma, when they are moved between the non-magnified visual field and the magnified field. The instrument tip is temporarily out of view. The scatoma of a system can be measured by using graph paper or a piece of plain paper. It is important to first have a reference point by marking an "x" on the paper. The field that is magnified can then be outlined. Using peripheral vision, one can then outline the outside circle, the one closest to the lenses in normal view. The difference between the two reflects the size of the magnification scatoma. The higher the magnification, the larger the magnification scatoma will be. The magnification scatoma also tends to be larger with flip-up systems than with TTL systems. The scatoma effect demands especially diligent control of instruments moving onto and off the magnified field. Most clinicians learn to protect the tip of the instrument with their fulcrum fingertip until the instrument is safely in view on the magnified field.

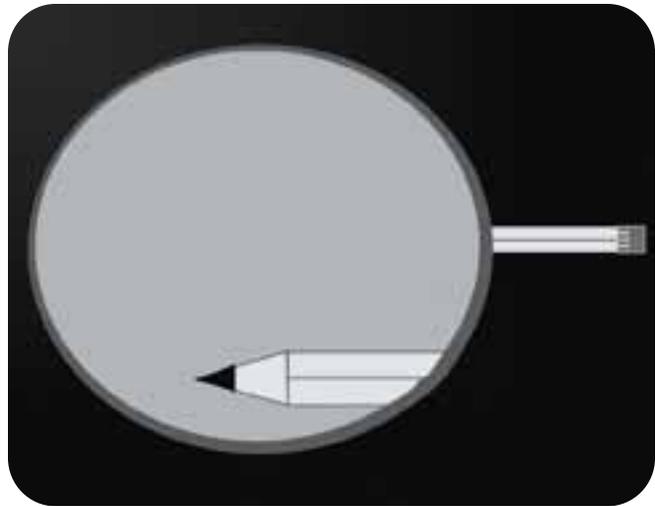


Figure 7. Non-coaxial viewing

Width of field

The width and height of the field of view depends upon many factors, but especially on the distance of the telescopes from the eyes. The closer the lenses are to the eyes, the larger the observed field. For flip-up lenses, this means ensuring that they are right against the surface of the carrier lenses.

A diffraction effect can also manifest as colour aberrations...

Adjustability

The TTL systems, by their very nature, are not adjustable by clinicians, although changes can be made by returning them to the manufacturer. The flip-up systems permit a variety of possible adjustments including interpupillary distance, vertical adjustment of the oculars, angulation of the oculars, and rotation of the oculars. Angulation of the oculars must be coupled with a vertical adjustment of the lenses in order to achieve true coaxial viewing at the clinician's correct declination angle. Telescopes without vertical adjustment are unlikely to be properly adjusted to match a clinician's declination angle, regardless of the range of tilting angulation achievable.

Resilience of system

Earlier frames for mounting magnification systems were substantial in construction; the Buddy Holly look predominated. More recently, frames come in lighter and more stylish versions. Many clinicians are drawn to these designer-type frames, but the frames may not be strong enough to support the lenses. If the frames allow for distortion of the vertical angulation of the lenses, the alignment of the oculars will be affected. This is extremely problematic and is a particular concern for TTL systems.

The resilience of a system is also affected by the clinicians' habits; clinicians will vary in the amount of wear

Clinicians need to select a product that allows them to see all parts of both the maxillary and mandibular arches clearly.

and tear to which they submit their telescopes. From an eye-protection perspective, it is also important to ensure that the size of the frames shield clinicians from the splatter associated with oral care.

Other variables

A number of other variables have also been tracked by the STEP evaluators. Cleaning and infection control issues were originally a concern, but most manufacturers have now been able to seal their units in such a manner that the telescopes can be treated as ordinary glasses. They may not be autoclavable, but they can be disinfected. Most systems cannot be fully submerged, although at least one manufacturer provides a claim to a complete seal of their oculars. Products come with a variety of accessories such as coloured frames, straps, side shields, and a selection of nose-pads. These reflect personal preference issues but can influence the comfort of the system.

DISCUSSION

In the field of surgical magnification, there are some essential features to assess plus many variables related pri-

marily to personal preferences (see table 1). The essential features include working distance, depth of field, optical declination angle, and coaxial alignment.

It is important to individually assess the working distance and depth of field of each magnification system, regardless of the statistics and data that manufacturers may provide about their products. The only depth-of-field information of any value to a clinician is that measured by an observer when the clinician is wearing the telescopes. With scopes in place and accurately adjusted for declination angle and coaxial viewing, the clinician should view a well-lit finger pad for the nearest and furthest point from the eyes at which the image of the magnified fingerprint can be resolved. This can be measured and compared with the optimal musculoskeletal working distance (where you choose to work in balance). If the depth of field provided by the telescope does not match the musculoskeletally derived working distance, the scopes must be exchanged for telescopes with farther or nearer working distances (as needed) and the new telescopes retested in the same way.

Younger clinicians will tend to experience a greater depth of field so the importance of this particular factor will be more obvious for older clinicians. Clinicians need to select a product that allows them to see all parts of both the maxillary and mandibular arches clearly. We have on rare occasion worked with dental clinicians whose vision did not allow for such a depth of field. In such cases, the client chair needs to be vertically adjustable to accommodate this limitation.

The telescopes also need to be accurately aligned with the musculoskeletally balanced sightline of the clinician to ensure that the clinician can move instruments accurately onto the magnified field. For example, when an instrument is moved horizontally into the centre of the field of view, it must appear continuous, not split (see figure 6). Halos of colour around viewed instruments and teeth are also indicators of non-coaxial alignment. From our experience, we have found that clinicians will try to compensate for non-coaxial alignment but this is awkward, energy consuming, and unnecessary.

Optical declination angles will commonly be presented as a range of degrees. A study at the University of British Columbia looked at optical declination angles by assessing 165 dentists and dental students to determine the range of head inclination identified by participants associated with their optimal control postures.³⁴ Participants' declination angles ranged from 15 to 44 degrees (m=34 degrees; sd= 5.5 degrees). Clinicians and novice students were quite specific in their choice of declination angle and their individual choices were reliably repeated.

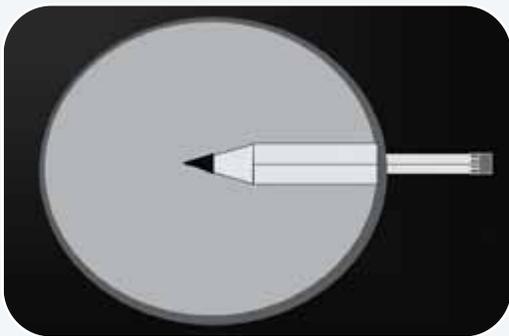
Clinicians can assess the declination angle of telescopes by first positioning themselves in their optimal working position. Then they need to close their eyes and carefully maintain their head position while the telescopes are positioned. They can then open their eyes to determine if the telescopes match their optimal declination angle (see figure 5). If clinicians need to raise or lower their heads in order to view the target intra-oral site when they perform this assessment, then the surgical telescopes require

Selecting Surgical Telescopes for Dental Hygiene Practice

The following questions will support you in your analysis of surgical telescopes so that you can make an informed decision about your purchase.

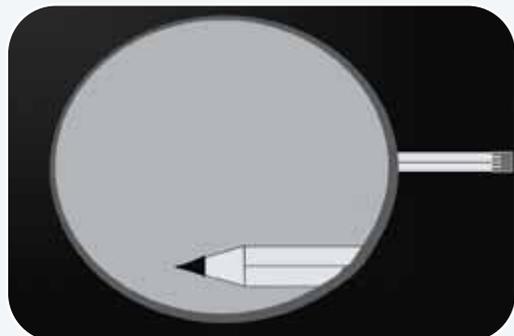
Critical features	Yes	No
1. Does the product meet, or can it be adjusted to meet, your optical declination angle (angle at which you can decline your eyes to see)?	<input type="checkbox"/>	<input type="checkbox"/>
2. Does it provide a working distance to match your balanced posture?	<input type="checkbox"/>	<input type="checkbox"/>
3. Does it provide a depth of field that allows you to see both the maxillary and mandibular arches clearly?	<input type="checkbox"/>	<input type="checkbox"/>
4. When using the telescopes, can you accurately <i>move onto the magnified field</i> ? (See diagrams below.)		

THIS!



(coaxial alignment)

NOT THIS!



(non-coaxial alignment)

If you have answered "yes" to the above items, then proceed to the next sections.

Magnification preference	2.0	2.5	3.0
5. What is your preferred magnification?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Table 1. Assessment of surgical telescopes

6. How important are the following characteristics in the selection of your surgical telescopes?

		Not important	Somewhat important	Quite important	Very important
Personal preferences					
6.1	Width of field (size of area I can see)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.2	Size of magnification scotoma	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.3	Weight of telescopes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.4	How weight is distributed (i.e., spectacles- or headband-mounted)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.5	Overall comfort of telescopes (including size, nose-pads and temple arms)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.6	Adjustability of telescopes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.7	Ability to resist distortion (resilience of frames)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.8	Frame or headmount style and colour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.9	Warranty of product	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.10	Service reputation of company	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.11	Cost of telescopes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Once you have completed an analysis of several products with this list of critical factors and personal preferences, we believe that you will be better able to make an informed purchasing decision.

Once you receive your surgical telescopes, you will need to verify the critical characteristics. In addition, you will also need to determine if the colour of oral tissues appears normal. If you see unusual halos of colour, it indicates that the telescopes are not aligned coaxially with your vision and they need to be further adjusted. If you have selected an adjustable system, you will need to work with the company representative to learn how to fine-tune your system. Some people find their telescopes work well from day one; others find that they need to make slight adjustments. Never underestimate the importance of these fine adjustments.

STEP website: www.dentistry.ubc.ca/research/ergonomics/princip.htm

adjustment or should be avoided. While surgical telescopes can help promote optimum positioning, they can also lock clinicians into uncomfortable positions that can lead to pain or exacerbate the pain and discomfort the clinicians may already be experiencing.

For TTL systems, the clinician's declination angle will need to be carefully measured prior to ordering so that the oculars can be properly aligned before they are sealed into the glasses. A one-size-fits-all approach should be rejected.

These essential characteristics can be best assessed in a clinical situation or one that closely approximates such an environment. It is critical to assess these characteristics carefully to determine if they meet clinicians' individualized needs, as the characteristics will affect clinicians' ability to work comfortably and efficiently.

There are many other variables beyond the critical elements that will influence the value and comfort of the telescopes for individual clinicians. These include the following:

1. power of magnification (2x, 2.5x, 3x)
2. total weight of the telescopes
3. comfort of the fit of the telescopes on the head including nose-pad design and number, temple arm, and overall size
4. size of the field of view and the magnification scotoma
5. distribution of the weight (that is, head-mounted versus spectacles-mounted systems, retaining straps, etc.)
6. ease of adjustment for the flip-up models
7. resilience of frames against distortion (especially for TTL systems)
8. esthetic considerations
9. warranty of product
10. service reputation of the company

While the critical characteristics are obviously important, the personal preference issues can also make a substantial difference to the clinicians' experience with surgical telescopes. Clinicians need to ensure that the product they select aligns with their most important preferences. Gaining a better understanding of personal preferences (see table 1) is an important first step when considering surgical magnification.

There is a range of magnification that can support operators' balanced positions. However, a lower magnification is generally preferable. The higher the magnification, the smaller the field of view, the smaller the depth of field, and the less light available for vision. Some manufacturers' representatives specifically recommend a magnification of 2.0x for dental hygienists but we are not aware of any evidence to support this statement. From our experience, most dental hygiene students select 2.0x or 2.5x magnification for their work. The determination is based on the clinicians' individual preference for magnification.

Once clinicians have completed an analysis of several products with the list of critical factors and personal preferences, we believe that they will be better able to make an informed purchasing decision. However, clinicians will

Personal preference issues can also make a substantial difference to the clinicians' experience with surgical telescopes.

still need to verify the critical characteristics when the surgical telescopes are received. For TTL systems, adjustments will need to be made by the manufacturer. For adjustable systems, clinicians will need to work with the company representative to learn how to fine-tune the system. Some people find their telescopes work well from the first day; others find that they need to make slight adjustments as they learn to work with the telescopes. Clinicians should never underestimate the importance of these fine adjustments.

CONCLUSION

The recent developments in ergonomic work environments are a positive step toward operator comfort. However, new ergonomic equipment has limited value without the critical analysis of current practice patterns, and the careful and thoughtful adaptation of available equipment to enhance optimized ergonomics of practice. Balanced positioning is the first step in supporting the health of clinicians. This step is essential for the successful integration of other strategies and equipment. Once balanced positioning has been established, the integration of surgical magnification has the potential to support the musculoskeletal health of dental hygienists and may also increase the quality of dental hygiene care. However, surgical magnification by itself is not a panacea for the musculoskeletal problems reported by dental hygienists.

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L'entraide (suite de la page 47)

dans leur ensemble. Les hygiénistes dentaires sont on ne peut mieux placés pour fournir les soins qui contribueront à prévenir les problèmes de santé bucco-dentaire.

Je suis fière d'être citoyenne d'un pays qui a fourni une aide de plus de 150 millions de dollars aux victimes du tsunami. Je suis fière aussi d'être concitoyenne des centaines de personnes qui ont donné de leur temps et offert bénévolement leurs services pour venir au secours des victimes de ce désastre.

Au terme de mon mandat à la présidence de l'ACHD, je suis aussi en mesure de dire à quel point je suis fière des hygiénistes dentaires au Canada. Je suis particulièrement fière de celles et ceux qui n'ont pas ménagé leur temps et leurs efforts pour l'avancement de la profession grâce à leur contribution à l'ACHD. Le conseil d'administration et le personnel de l'ACHD m'ont été d'une aide inestimable au cours des dix-huit derniers mois. Ce fut vraiment un privilège et un plaisir que de rencontrer pendant mon mandat tant de collègues en provenance des quatre coins du pays. J'ai maintenant le grand honneur d'accueillir Diane Thériault au poste de présidente de l'ACHD et de vous inciter tous et toutes à continuer d'appuyer notre profession et l'ACHD.

Merci et au revoir. 

On peut communiquer avec Patty Wickstrom à l'adresse < president@cdha.ca >.

Caring for Each Other (continued from page 47)

As I complete my term as the CDHA President, I can also say how proud I am of the dental hygienists in Canada, especially those who have dedicated time and effort to advance the dental hygiene profession through their involvement with CDHA. The Board of Directors and the CDHA staff have been invaluable to me over the past 18 months. It has been such a privilege and pleasure to meet so many of my colleagues from across the country during my term. Now it is a great honour to welcome Diane Thériault to the position of CDHA President and to encourage all of you to continue your support of our profession and the CDHA.

Thank you and au revoir. 

Patty Wickstrom can be reached at < president@cdha.ca >.

Dental Hygiene Student Experience with Ethically Problematic Situations

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ABSTRACT

An ethical centre or code is one of the foundations of any professional practitioner and it manifests in practice as ethical behaviour. An understanding of ethical dilemmas, and of the processes to work through these dilemmas, begins with the educational preparation of dental hygiene students. Literature from other health professions suggests that the ethical dilemmas students encounter in learning settings differ from the dilemmas encountered in practice. Anecdotal evidence has suggested that dental hygiene students are faced with ethically problematic situations particular to their clinical education, and that students do not feel these problems are adequately resolved. The purpose of this study was to identify how frequently students encounter ethically problematic situations, and their actions and feelings at these times. A survey questionnaire with 12 multiple-choice items and one open-ended question was developed from previous studies. There were 188 completed survey questionnaires received from students enrolled in five dental hygiene programs in Canada. Of these respondents, nearly half (44.6%) had witnessed unethical behaviour by a dental hygiene instructor/other instructor, and over half (51.7%) had witnessed unethical behaviour by another dental hygiene student. Those witnessing unethical behaviour were most likely to feel bad or guilty (29.8%) or confused (28.2%). Fewer than 10% felt comfortable challenging the individuals involved and discussing it with them. These findings suggest a need to better prepare students to address ethical dilemmas specific to students so they develop the skills and confidence necessary to address ethical dilemmas they may encounter in their future practice settings.

Key words: dental hygienists, ethics, ethical aspects, ethical dilemmas, students

INTRODUCTION

Dental hygiene is described in the literature as being an emerging profession.¹⁻⁶ One of the foundations of any professional practitioner is an ethical centre or code, which manifests in practice as ethical behaviour. The Canadian Dental Hygienists Association has recently released updated versions of its *Code of Ethics*⁷ and its *Dental Hygiene: Definition, Scope, and Practice Standards*⁸ documents, providing all members with updated guidelines of expectations in practice. As dental hygienists move increasingly into other practice settings, a corresponding accountability will be consistent with the responsibility. By the nature of their most common practice setting, private clinical practice, dental hygienists do not have access to the institutional ethics or practice standards committees found in employment settings for other professions such as medicine and nursing. Consequently, dental hygienists must rely on themselves for clinical and ethical decision-making. An understanding of ethical dilemmas, and the processes to work through these dilemmas, begins with the educational preparation of dental hygiene students.

Studies and theoretical essays have described ethical dilemmas faced by medical students particular to clinical settings, and the effects these dilemmas have on the education of the students.⁹⁻¹² Anecdotal evidence suggests that dental hygiene students are faced with ethically problematic situations particular to their clinical education and that students do not feel these dilemmas are adequately resolved. On-line searches of Medline and PubMed databases failed to uncover studies of this nature conducted with dental hygiene students. There is a need to examine the nature and extent of the ethically problematic situations experienced by dental hygiene students during their clinical education experiences.

The premise of this study is that the nature and prevalence of ethical dilemmas experienced by dental hygiene students during their clinical education must be recognized and understood as a first step prior to resolving them. This has the potential benefits of improving dental hygiene students' clinical education experiences and of enhancing their ability to identify and address ethical dilemmas.

REVIEW OF RELEVANT LITERATURE

Educators accept that part of clinical education in a professional program such as dental hygiene includes socialization and that this socialization includes a moral dimension.^{9,13} Professional socialization has been defined as the "processes by which people acquire the values and attitudes, the interests, skills and knowledge—in short, the

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Not all of what is taught and learned in dental hygiene professional education comes from a course syllabus or calendar description.

culture—current in the groups of which they are, or seek to become, a member.”⁹ (p. 865) Not all of what is taught and learned in dental hygiene professional education comes from a course syllabus or calendar description. Some authors have suggested that much of what medical students learn in their clinical experiences comes from a “hidden curriculum,”⁹ and anecdotal evidence suggests that dental hygiene students may be subject to similar influences. The “formal curriculum”—that published in course descriptions and syllabi, lecture notes and handouts—forms the bulk of the content within the curriculum. The “hidden curriculum” can be thought of as the set of influences and values that become apparent to the students as they progress through their clinical experiences. Studies with medical students have suggested that the influences of the “hidden curriculum” undermine the formal curriculum.^{9,11,12,14} Hafferty has further suggested the fact that much of this learning “occurs at an implicit level renders conflicts between the hidden and formal curriculum even more resistant to resolution.”¹⁰ (p. 405)

Many aspects inherent to the professional educational process contribute to the unique ethical dilemmas faced by students. Students are faced with the responsibility to learn content, work as part of a health care team, and work on client/patients.¹² These multiple roles may sometimes conflict, as when the student is simultaneously a learner and a provider of care.⁹ Students sometimes have more

time to spend in discussion with the client/patient than faculty members and may feel they have a better understanding of the needs of the client/patient.¹² Despite their divided loyalties to the health care team and the patient, students in some studies have felt they may have acted improperly in order to fit in with the team or for fear of a poor evaluation.¹⁴ Christakis and Feudtner refer to the desire to be perceived as a “team player” and point out that often individuals sense what they ought to do but instead do something they believe is wrong.¹² Christakis and Feudtner note that medical students cited instances where they witnessed or assisted with unethical actions but for various reasons felt unable to control it.

Much of the teaching of ethics focuses on case studies or reviews of dilemmas based on future practice settings.^{10,15} Bissonette et al. went so far as to note that the “use of high-visibility high drama case materials for teaching” had little relevance to the learners’ experience.¹⁶ Feudtner et al. suggested that completing course work in ethics did not alter students’ likelihood of self-reported unethical behaviour because the dilemmas that students face differed significantly from those presented in course work.¹⁴ Swenson and Rothstein suggested that students must understand and learn from the dilemmas that shape their world by learning how to respond to those dilemmas appropriately.¹⁵

Various studies have identified differing categories and characterizations of ethical dilemmas faced by medical students.^{10,12,16} These include conflict between the priorities of medical education and those of patient care; being a “team player”; challenging medical routine; respect toward patients; communication issues; limits of intervention issues; student boundaries; defensive shielding; and a miscellaneous category. Hicks et al. suggest that learning

RÉSUMÉ

Le centre d'éthique ou code de déontologie constitue l'un des fondements de tout praticien professionnel; dans la pratique, il se manifeste comme étant le comportement éthique. La compréhension des dilemmes moraux, et des processus pour en sortir, commence par la préparation didactique des étudiantes et des étudiants en hygiène dentaire. La documentation provenant des autres professions de la santé porte à croire qu'en contexte d'apprentissage, les étudiants sont aux prises avec des dilemmes moraux différents de ceux auxquels on se heurte dans la pratique. D'après des renseignements non scientifiques, les étudiants en hygiène dentaire doivent affronter des situations problématiques sur le plan déontologique qui sont particulières à leur formation clinique et ils n'ont pas l'impression que ces problèmes sont résolus adéquatement. La présente étude a pour objet de déterminer la fréquence avec laquelle les étudiants se retrouvent dans des situations problématiques du point de vue de la déontologie, les gestes qu'ils posent en pareil cas et les sentiments qu'ils éprouvent alors. Un questionnaire de sondage comportant 12 choix multiples et une question ouverte a été élaboré à partir d'études existantes. Ce questionnaire a suscité 188 réponses venant d'étudiants inscrits dans cinq programmes d'hygiène dentaire au Canada. Parmi ces répondants, près de la moitié (44,6 %) ont été témoins de comportements contraires à l'éthique de la part d'un chargé de cours, en hygiène dentaire ou dans une autre matière; en outre, plus de la moitié (51,7 %) ont été témoins de comportements contraires à l'éthique de la part d'une autre étudiante ou d'un autre étudiant en hygiène dentaire. Les personnes qui ont été témoins d'un comportement contraire à l'éthique sont celles qui risquaient le plus de se sentir mal ou de se sentir coupables (29,8 %) ou d'être déconcertées (28,2 %). Moins de 10 % se sentent à l'aise d'interpeller les personnes en cause et d'en discuter avec elles. Ces constatations portent à croire qu'il faut mieux préparer les étudiantes et les étudiants à s'attaquer aux problèmes de déontologie qui leur sont propres. Ainsi acquerront-ils les compétences et la confiance nécessaires pour surmonter les dilemmes moraux auxquels ils pourraient devoir faire face à l'avenir dans la pratique.

Mots clés : hygiénistes dentaires, déontologie, aspects éthiques, dilemmes moraux, étudiants

to recognize and explore the ethical dilemmas faced by medical students will “expose and ultimately dismantle deleterious aspects of the hidden curriculum.”¹⁰ (p. 710)

The dental hygiene literature reveals no studies aimed at identifying the prevalence and nature of ethical dilemmas that dental hygiene students encounter in the course of their professional education programs. The research questions that guided this study were the following:

- Do dental hygiene students feel ethical distress during the course of their clinical education programs?
- What is the nature of the situation(s) causing dental hygiene students to feel this way?
- How prevalent are such situations?

METHODS

The design of this study was based on a 2001 study originally conducted with medical students.¹⁰ It included a survey questionnaire with 12 multiple-choice items and one final open-ended question that invited respondents to describe any situations they may have encountered that caused them to feel ethical discomfort or ethical distress, and if they wished, to indicate how they felt or anything they said or did as a result of the situation. Questions were developed based on findings from studies with medical students that had been conducted in various locations.^{10,12,14,16} Examples of questions are shown in figure 1. The first phase of data collection was to determine the frequency and extent of ethical dilemmas or distress

As faculty members from other institutions became aware of the planned study, several expressed interest in participating.

perceived by students. The second phase included a planned focus group discussion designed to explore ethically problematic situations students may have encountered, and student perceptions of how their ethical development was impacted by the resolution of these situations. The study design was modified to remove the focus group discussions after an inadequate number of students signed up to participate.

The study was designed by two faculty members from one institution. As faculty members from other institutions became aware of the planned study, several expressed interest in participating. The lead institution sought ethics approval from their ethics review committee to conduct the study locally. Subsequently, dental hygiene faculty members from four other institutions arranged to conduct the study within the ethics guidelines of their own institutions. An informational covering letter advised students that, if their participation in the study and their recall of ethically problematic situations led to feelings of discomfort, students would be provided with access to confidential student counselling.

1. While practising as a dental hygiene student in the clinical education program, did you ever witness unethical behaviour by a dental hygiene instructor/other instructor?
 This did not happen
 This happened on one occasion
 This happened on two occasions
 This happened on more than two occasions
2. While practising as a dental hygiene student in the clinical education program, did you ever witness unethical behaviour by another dental hygiene student?
 This did not happen
 This happened on one occasion
 This happened on two occasions
 This happened on more than two occasions
3. While practising as a dental hygiene student in learning environments other than the dental hygiene clinic, did you ever witness unethical behaviour by any of the following? Please check any that apply.
 Other student
 Dental hygiene instructor
 Other instructor
 Other staff member at that site
4. If you witnessed unethical behaviour on one or more occasions, did you experience any of the following feelings? Please check any that apply.
 Felt like an accomplice to the action
 Felt bad or guilty
 Felt displeased with my ethical development
 Felt confused
 Felt that some of my ethical principles had been eroded or lost
5. If you were involved in such a situation, did you feel comfortable challenging the individuals involved and discussing the situation with them?
 No, I did not feel comfortable doing this
 Yes, I felt comfortable and discussed it with the individual(s)

Figure 1. Sample questions from survey questionnaire

Completed survey questionnaires were received from 188 students from five dental hygiene educational programs within Canada.

Each institution distributed and collected the survey questionnaires that were subsequently returned to the lead institution. Responses to the 12 multiple-choice items were entered into SPSS (a statistical software package) by research assistants. Descriptive statistics from the data were analyzed using measures of central tendency, including frequency distributions of variables. Data were combined from all participating institutions. To respect confidentiality and to protect the students, data were not analyzed by separate institutions but rather as one large group.

Text-based responses to the final open-ended question were entered into a Word document by research assistants. This text was reviewed independently by four of the investigators, then notated, coded, and categorized independently. Text was reviewed and coded by underlining words and phrases that represented the different ideas or topics that came up through the students' written comments. At this time, the investigators made handwritten notes and comments in the margins and text of the responses. The document was then reviewed again and each investigator began to list labels of categories for the sections they had underlined and for their handwritten notes and comments. The text and notes were reviewed again with the category labels in mind, to determine whether categories should be expanded, collapsed, or new categories created. Following this independent determination of categories, two investigators together reviewed all materials to determine whether categories overlapped, were redundant, or adequately represented the coding that had been initially identified. The two then classified a final set of categories. These categories were then determined to be the products of analysis of the final open-ended question.

RESULTS

Completed survey questionnaires were received from 188 students from five dental hygiene educational programs within Canada. Senior students were targeted in this study as they had more extensive clinical experience. The first two questions in the survey questionnaire related to the dental hygiene clinical educational setting and asked students if they had witnessed unethical behaviour by their peers or faculty members. Just over half (51.7%) of responding dental hygiene students reported witnessing unethical behaviour by another dental hygiene student while practising in the clinical education program, with 27.2% reporting witnessing this type of behaviour on more than one occasion. Further, 44.6% of responding dental hygiene students reported witnessing unethical behaviour by either a dental hygiene instructor or another instructor in the clinical education program, with 22.3% reporting this on two or more occasions.

Students were also asked whether they witnessed unethical behaviour in learning environments other than the dental hygiene clinic. Their responses are summarized in table 1 below.

	Yes	
	n	%
Unethical behaviour by an other instructor (n=188)	17	9.0
Unethical behaviour by an other staff member (n=188)	36	19.1
Unethical behaviour by a dental hygiene instructor (n=188)	39	20.7
Unethical behaviour by an other student (n=187)	50	26.6

Table 1. Frequency of unethical behaviour witnessed in learning environments other than the dental hygiene clinic

Students were asked how they felt if they had witnessed unethical behaviour. They could choose more than one option from a list of feelings that had been reported in other studies of ethically problematic situations during health professional education.¹⁴ Table 2 reports frequency distributions of feelings students had when they witnessed unethical behaviour on one or more occasions.

	Yes	
	n	%
Felt displeased with own ethical development	19	10.1
Felt like an accomplice to the situation	22	11.7
Felt that some ethical principles had been lost or eroded	35	18.6
Felt confused	53	28.2
Felt bad or guilty	56	29.8

Table 2. Frequency of feelings experienced by students who had witnessed unethical behaviour on one or more occasions (n=188)

The survey questionnaire asked students if, when they were practising as a dental hygiene student in a clinical environment, they had ever participated in any actions that caused them to feel ethical distress. The majority, 64.9%, reported that they never felt this way. Nearly one-quarter, 22.3%, reported that they felt this way on one occasion, 7.4% reported feeling this on two occasions, and 2.7% reported feeling this way on more than two occasions.

A further question asked students whether, if they had been involved in such a situation, they had felt comfortable challenging the individuals involved and discussing the situation with them. Table 3 below illustrates that over two-thirds of respondents did not feel comfortable to discuss the situation with those involved.

	n	%
Not involved in ethically problematic situation	40	21.4
Yes, felt comfortable and discussed it with the individual	18	9.6
No, did not feel comfortable doing this	129	68.9

Table 3. Frequency of respondents involved in ethically problematic situations who felt comfortable in challenging individuals involved and discussing the situation (n=187)

Students were also asked a series of questions about actions they may have, for various reasons, felt pressured to participate in, while practising as a dental hygiene student in a clinical environment. Table 4 lists the frequencies of responses for each of the various reasons.

The survey questionnaire also contained a question asking if they had ever encountered behaviour they would consider unethical in the classroom or a setting outside of the clinical environment. Forty-four percent responded that this did not happen, 25.0% responded that this happened on one occasion, 7.4% responded that it happened on two occasions, and 21.3% responded that it happened on more than two occasions.

The final question on the survey was open-ended and asked students to describe any situations they may have encountered that caused them to feel ethical discomfort or ethical distress. Respondents could, if they wished, to indicate how they felt or anything they said or did as a result of the situation. Data were coded and categorized, resulting in two main sources of ethically problematic behaviour: situations that arose from student behaviours and those that arose from instructor behaviours.

The data provided evidence that dental hygiene students had experienced ethical distress while participating in dental hygiene clinics and in other learning environments.

Within the theme of student behaviours, five main categories were noted:

- breaches of clinical protocols (such as infection control)
- cheating (on exams) or fraud (such as falsely booking appointments)
- prejudice and discrimination
- confidentiality (particularly breaches of)
- action (such as discussing the situation or having appropriate disciplinary measures implemented) versus inaction (ignoring the situation, or students committing breaches not suffering any consequences)

Many times within their comments students suggested their preferred actions.

Within the theme of instructor behaviour, five different but overlapping categories were identified:

- inappropriate documentation (such as in client charts)
- breaches of clinical protocol (such as infection control)
- inappropriate use of “power over” students (such as inappropriate rudeness, or a student feeling they must follow an instructor’s recommendation while knowing it to be wrong)
- lack of respect for students (such as disciplining students in front of clients or classmates)
- inconsistent use of evaluation guidelines

DISCUSSION

The data provided evidence that dental hygiene students had experienced ethical distress while participating in dental hygiene clinics and in other learning environments. Nearly a third of students reported feeling confused

	Did not happen %	Happened on one occasion %	Happened on two or more occasions %
Felt pressured to mislead patient by not telling the truth or withholding information (n=187)	85.0	10.2	4.8
Felt pressured to do something that put you at personal risk (n=187)	84.0	11.2	4.8
Felt pressured to do something that put your patient/client at personal risk (n=187)	84.0	12.8	3.2
Felt pressured to do something you considered unethical in order to “fit in” (n=186)	83.9	10.8	5.4
Felt pressured to do something you considered unethical for fear of a poor evaluation (n=186)	68.3	21.0	10.8

Table 4. Frequency (reported as percentage) of reporting feelings of pressure to participate in various actions during student clinics

The majority of respondents did not feel comfortable challenging the individuals involved in ethically problematic situations and discussing the situation.

(28.2%) or bad or guilty (29.8%) after they had witnessed unethical behaviour. Since students are reporting having these feelings, it is important that educational programs consider providing opportunities for students to discuss the situations, their feelings, and to try to find solutions. Solutions need to examine ways for students to address what they can do in future. Students need to feel they can play a meaningful role in addressing these dilemmas so as not to feel their efforts may be futile and not lead to change. Administration may need to become involved to attempt to find ways to prevent those ethically problematic situations involving faculty from occurring in the future.

The majority of respondents did not feel comfortable challenging the individuals involved in ethically problematic situations and discussing the situation. This brings up a number of issues for educational programs to consider. There may be a need to provide safe opportunities for students to develop sufficient confidence to challenge those

involved in ethically problematic situations. It also raises the following question: If they do not develop this comfort and confidence as students, why would we assume they would be comfortable and confident doing this as practitioners? Since this is an intended outcome of ethics education, it is critical that there be provision for development of such skills.

One previous survey of ethical issues in dental hygiene practice identified the main ethical dilemmas encountered in practice settings:

- behaviours in conflict with standards of infection control
- failure to refer patients to specialists, leading to decline in patient health
- non-diagnosis of dental disease
- substandard care provided by other dental hygienists
- restricted ability to provide dental hygiene care because of supervision requirements
- restricted opportunity to provide quality care to populations with limited access (such as the homebound or institutionalized)¹⁷

In this study, responses to the text-based question identified categories that are similar, including breaches of clinical protocols. Students need to be comfortable addressing these issues as students so they can feel confident addressing them should they arise in practice.

One-third of students responded that they felt pressured to do something they considered unethical for fear of a poor evaluation. Medical students also reported feeling pressure for the same reasons.^{12,14,15} This may be due to the power relationship between students and instructors. This in turn leads to future concerns about the power relationship between employers and employees, and whether dental hygiene graduates will have the skills and confidence to address ethically problematic situations that may arise between individuals with differing levels of power. How can dental hygiene educational programs better prepare their graduates to handle ethically problematic situations with confidence?

While there was no intent to report on findings from individual institutions, it is important to note that findings were similarly distributed across participating institutions. Given the diversity of the educational settings, and their geographic distribution across Canada, this leads the authors to believe that dental hygiene students are faced with similar ethically problematic situations no matter what their educational setting or location. This also suggests an opportunity for a collaborative national approach to a solution, perhaps through national professional organizations or national educational organizations.

That students are aware of ethical breaches and feel uncomfortable is encouraging because it suggests development of practitioners who have an ethical foundation. This is positive for our emerging profession. Frankel suggests that "morality encompasses more than action, and being a professional is not only a matter of intellect and skill, but also of character and virtue."¹⁸ These students appear to be on the right track. The fact of students not

These findings suggest a need to better prepare students to address ethical dilemmas specific to students, perhaps prior to providing them with ethical dilemmas specific to practice-related settings.

always feeling comfortable challenging those involved in the ethically problematic situations is rather more worrisome. It does not bode well for employee-employer dilemmas where “power-over” is an issue and where dental hygienists might feel their employment could be threatened if they challenged a situation.

CONCLUSION

The purpose of this study was to identify the frequency and prevalence of ethically problematic situations encountered by dental hygiene students in the course of their clinical education, with the assumption that examining the dimensions of a perceived problem is a first step toward developing and implementing solutions. Over half of the responding students witnessed unethical behaviour by another dental hygiene student; nearly half witnessed unethical behaviour by a dental hygiene instructor or another instructor. Those who did witness such behaviour reported feeling bad, and/or guilty, or confused. Students witnessing unethical behaviour were most likely to report that they did not feel comfortable challenging those involved and discussing the situation with them. Over half of responding students encountered behaviour they would consider unethical in the classroom or a setting outside of the clinical environment.

These findings suggest a need to better prepare students to address ethical dilemmas specific to students, perhaps prior to providing them with ethical dilemmas specific to practice-related settings. Research suggests the use of cases when teaching ethics is more effective as it actively involves students in the learning process. Teaching cases dealing with dilemmas that students encounter is preferable to using high-drama cases from clinical practice to which students cannot yet relate.^{12,19} Cases such as these should be developed from existing student experiences. As part of the continued movement toward the status of a profession, professional associations and educational associations can and should support these moves to enhance ethical education within the dental hygiene curriculum.

Recommendations for future research include conducting phase two, focus groups to explore students’ perceptions of the influence of ethically problematic situations on their ethical development. Another recommendation is for a national study in Canada of ethical dilemmas encountered in dental hygiene practice. Findings from such a study could be useful in developing ethics curriculum materials to prepare new graduates or for continuing education in ethical decision-making.

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Disease Prevention in the Music Environment: Guidelines for the Dental Hygienist

by Patricia L. Dray,* MEd

ABSTRACT

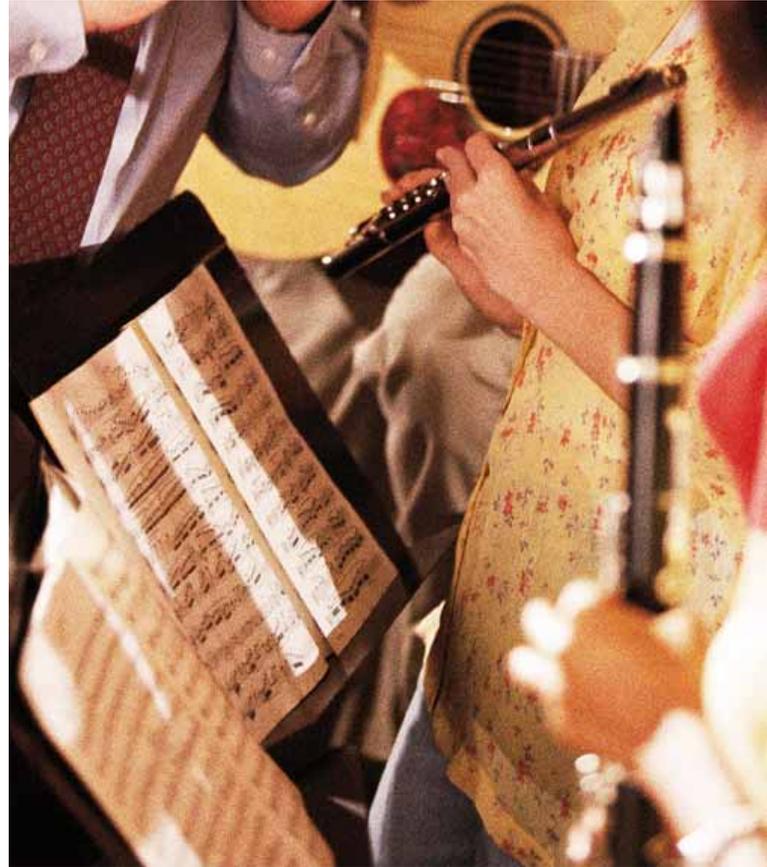
Recent research on biofilms, the emergence of new infectious agents, and the increasing resistance of many diseases to antibiotic and antibacterial agents, raises concerns for individuals involved in the music profession. Saliva can transmit a variety of infectious microorganisms that can ultimately have long-term effects on general health. Mouthpieces and instruments provide a natural environment for bacteria to flourish and act as pathways for disease transmission. There is a lack of information and misconceptions about how to prevent disease transmission in the music environment. Dental hygienists therefore have a responsibility to educate their clients. This article revisits infection control protocols and practical guidelines to break the chain of disease transmission in the music environment.

Keywords: musical instruments, dental hygiene practice, biofilms, disinfection

INTRODUCTION

GermS have no boundaries. Dental hygienists, as health care professionals, should be cognizant of all the possible environments in which disease can be transmitted. With this in mind, dental hygienists have a responsibility to advise their clients of potential modes of disease transmission. The music environment is one such area. With the increasing virulence and resistance of many diseases today, music professionals are not immune to the potential risk of transmitting infectious micro-organisms. Individuals who are teachers, repair technicians, retailers, and performers all come into contact with oral fluids in their daily routines. It is prudent to revisit the topic of infection control considering the emergence of infectious agents such as Severe Acute Respiratory Syndrome (SARS), research on biofilms and their relationship to general health, recent data on the infectious nature of dental caries and periodontal disease,¹ revised infection control protocols, and product information.^{2,3}

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There is no current documentation on the spread of infections through musical instruments. From the author's experience, however, the spread of infection is a common problem. As a health professional, educator, and former band teacher, the author knows how difficult it is to manage rental nights with multiple students, limited mouthpieces, reeds, and time. It can be almost impossible for busy teachers to monitor students who just want to share instruments with their friends or who, due to time constraints, are likely to use a child's mouthpiece or reed to check out a mechanical problem. Performers often try out mouthpieces at retail locations without thinking of who might just have used them or even if and how they were disinfected. Retailers often pass mouthpieces from one customer to the other with minimal cleansing. Repair technicians run the risk of aerosol transmission while cleaning instruments or of receiving puncture wounds, cuts, and abrasions from repairing the intricate wire workings of an instrument. Considering the above, many of the disinfection concepts and procedures utilized in the practice of dental hygiene can be applied directly to brass and woodwind instruments.

LITERATURE REVIEW

It is well established that saliva is a vehicle for transmitting a large variety of micro-organisms, which could include chicken pox, measles, staphylococcal and streptococcal infections, hepatitis, herpes, and tuberculosis. Biofilms are capable of attaching to living and inanimate surfaces,⁴ for example, mouthpieces, pads, and inside the tubing of instruments. In addition, studies at the Center for Disease Control indicate that pathogenic organisms can survive and remain active on inanimate surfaces for significant periods of time.⁵ Herein lies the cause for concern in the music environment. Mouthpieces and instruments provide a convenient nidus for biofilms to flourish. Contact with oral fluids, such as saliva, blood, and mucous membranes, makes them a semi-critical pathway for disease transmission.⁶ Due to the fact that these semi-critical pathways involve contact with oral tissues, music professionals are therefore susceptible to, and capable of, spreading disease.

It is crucial to teach your clients about the chain of disease transmission. According to Wilkins,⁷ the chain involves the following:

- an **infectious agent** such as a bacteria or virus;
- a **reservoir** that could be people, equipment, instruments, or water;
- a **port of exit** such as saliva, blood, mucous membranes, or droplets;
- **transmission**, that is, direct or indirect contact with the infectious agent;
- a **port of entry**, for example, mucous membranes, respiratory tract, broken skin, nose, mouth, and eyes; and,
- a **susceptible host** or individual.

Disease transmission in the music environment is most commonly of the indirect nature, that is, micro-organisms can be transferred from an individual to an inanimate object, such as an instrument or mouthpiece and then on to another individual.⁶ Detecting which individuals may be harbouring an infectious micro-organism at any given point in time is not possible. Thus music professionals must assume everyone is a potential carrier. In order to break this chain of disease transmission, universal precautions should be recommended to your clients,⁸ especially since health histories are not part of the music industry protocol.

Mouthpieces and instruments provide a convenient nidus for biofilms to flourish. Contact with oral fluids...makes them a semi-critical pathway for disease transmission.

In dealing with inanimate objects, such as mouthpieces and instruments, there are processes that can be used to reduce the risk of infection. Sterilization, disinfection, and sanitization are all ways in which micro-organisms can be reduced or killed. However, with musical instruments and mouthpieces, this is easier said than done. Caution should be taken as music armamentariums can be made of plastics, rubbers, metal, and metal plating. All of these materials can be affected negatively by the disinfecting process. **Sterilization**, such as steam under pressure, dry heat, or chemical vapor, is the most effective. Unfortunately, the high cost of equipment limits the feasibility and cost-effectiveness in the school or commercial environment.

When sterilization is not practical, as in this case, **disinfection** is the next best choice. Disinfection does not completely destroy all forms of micro-organisms. It is therefore **not** a substitute for sterilization. However, high-level disinfection, due to its practicability and cost, is the most feasible protocol for disinfection of instruments and mouthpieces.

Sanitization implies a cleansing process and is effective only in reducing the number of organisms on inanimate objects, not actually providing freedom from them. Sanitization provides little or no microbial kill. Household cleaning products, while accessible and cheap, are often incompatible with instruments and are not as effective as needed.

DISCUSSION

As with any discipline, there are many misconceptions about sterilization and disinfection. "Commonly used" disinfectants that are ineffective or incompatible with instruments and mouthpieces include alcohol, boiling water, chlorine compounds, and iodine based products. Alcohols will not inactivate the hepatitis virus and cannot penetrate debris that may be left on the object. Debris that has not been removed can subsequently become sealed on

RÉSUMÉ

Les recherches récentes au sujet des mucilages, de l'émergence de nouveaux agents infectieux et de l'accroissement de la résistance de nombreuses maladies aux agents antibiotiques et antibactériens soulèvent des préoccupations en ce qui concerne les musiciens et musiciennes de profession. La salive peut transmettre divers micro-organismes infectieux susceptibles en fin de compte d'avoir des effets à long terme sur la santé générale. Les embouchures et les instruments constituent un milieu propice à l'épanouissement des bactéries; ce sont des canaux de transmission de la maladie. Il existe un manque d'information et des conceptions fausses à propos de la manière de prévenir la transmission de la maladie dans le monde de la musique. Les hygiénistes dentaires ont par conséquent la responsabilité d'informer leurs clients. Le présent article revient sur les protocoles de prévention des infections et les directives d'ordre pratique visant à briser la chaîne de transmission de la maladie dans le monde de la musique.

Mots clés : instruments de musique, pratique de l'hygiène dentaire, mucilages, désinfection

Finding a disinfectant that is both effective and compatible with musical instruments or mouthpieces is a difficult task.

the surface of the item. In addition, alcohol swells plastics, is absorbed by rubber and cork, and its rapid evaporation diminishes its effectiveness. Boiling water does not kill spores and can corrode certain metals.

Quaternary ammonium chlorides are easily “inactivated” by the presence of soaps, hard water, plaque, saliva, and blood. Even at high disinfectant concentrations, they are ineffective against tuberculosis and the polio virus.⁹

Quaternary ammonium compounds are used as sanitizers in over-the-counter products at music retail outlets.

Some products only have 0.06% of the active ingredient and recommend coverage for one minute to be effective. Although these compounds are approved by the United States Environmental Protection Agency (EPA) as “intermediate disinfectants,”⁵ they are not recommended as disinfectants or sterilants by the Clinical Research Associates¹⁰ due to their ineffectiveness against tuberculosis and viruses.

Chlorine compounds, such as household bleaches, will disinfect in 10 to 30 minutes. Even though these compounds are very effective, the negatives outweigh the positives. Due to instability and limited life, they must be prepared daily with distilled water. Bactericidal activity is also diminished if there is any debris left on the object and the odour is unpleasant and irritating. Chlorine corrodes metal, removes silver plating, and degrades plastics and rubber-coated materials. Due to its highly corrosive nature, it is not recommended as a disinfectant for mouthpieces or instruments. Iodophors are iodine-based products that are economical, inexpensive, and effective, with disinfection occurring within 3 to 30 minutes. Discolouration of light-coloured surfaces with repeated use and corrosiveness to metals make it unsuitable for our purposes.

A suitable disinfectant should cover a broad spectrum of micro-organisms, be fast acting, non-toxic to oral tissues, non-corrosive to metals, and not disintegrate rubber or plastics.⁷ From a practical standpoint, they should also be easy to use, odourless, and economical. Combination phenolics, either alcohol- or water-based, are non-corrosive, non-irritating, non-odorous, and compatible with most metals and plastics, and are relatively inexpensive. When looking for a suitable disinfectant, clients should be advised to check for an EPA registration number. The EPA and the Food and Drug Administration (FDA) have the most widely recognized regulations in North America for approval of chemical sterilization and disinfection solutions. Health Canada holds responsibility for monitoring the safety and efficacy of disinfectants and sanitizers, as well as administering the Food and Drug Act, and nutritional labelling in Canada.¹¹

METHODS AND MATERIALS

As one can ascertain, finding a disinfectant that is both effective and compatible with musical instruments or mouthpieces is a difficult task. There is no solution that is effective with just a wipe on-wipe off approach.¹² Currently, research pertaining to the disinfection of musical instruments and accessories is limited. An analysis was conducted by the author, evaluating current product information and its compatibility with the materials used in the construction of instruments and mouthpieces. Many of the disinfection products were eliminated automatically due to their corrosive nature, absorbency, staining, or irritation to tissues. Tests were performed on brass-plated mouthpieces using chlorine and buffered chlorine products. Chlorine diluted at low concentrations corroded the metal plating. Buffered chlorine products, although less damaging, required close monitoring of immersion times due to the risk of corrosion.

RECOMMENDATIONS

Anticipating that repair technicians, sales representatives, teachers, and performers will find that preventing disease transmission is an onerous task, the following guidelines have been categorized (product compatibility, instrument care, and personal) to assist you in educating your music industry clients in breaking the chain of disease transmission.

Product compatibility

- Advise your clientele that using quaternary ammonium compounds, alcohols, simple phenols, or boiling water as surface or immersion disinfectants is not good practice.
- Educate your clients that acid baths using hydrochloric acid are for removal of corrosion and not meant for disinfecting purposes.
- Inform clients that a chemical at different concentrations may require 6 to 10 hours vs. 10 to 30 minutes for total disinfection. Never over-dilute or rush immersion times. Immersion times must be uninterrupted, so if an item is placed in a solution and then another item is added a few minutes later, the original immersion time must be restarted.
- If clients are unsure regarding the compatibility of a product, have them perform a PRE-TEST or call the manufacturer or distributor.

Instrument care

- Recommend that your clients always follow the manufacturers' instructions.
- Suggest single disposable items, like brushes or swabs, for cleaning instruments.
- Instruments and mouthpieces should be cleansed with soap and warm water and rinsed thoroughly to remove the chemical residue that could cause irritation to skin, lips, and other tissues prior to giving to another musician or after an individual has had a contagious disease.⁵ Instruments purchased from pawn shops should be thoroughly washed and scrubbed prior to use. Reeds

contaminated due to colds, flu, or other infections should be discarded.

- Advise clients to inquire of retailers or teachers as to how mouthpieces are disinfected.
- Remind your clients to check product labels. Terminology may not accurately reflect the effectiveness of the agent. Surface wiping or immersion in solution for a few minutes does not sterilize or disinfect.

Personal

- Hand hygiene is key to minimizing the transfer of pathogens. It is considered the single most critical measure for reducing the risk of disease transmission.⁵ Hand washing with an antimicrobial soap for 10 to 15 seconds or with an alcohol-based hand rub until the agent is dry should be recommended prior and subsequent to handling instruments.⁶
- Cuts or hangnails provide a convenient port of entry for bacteria. Therefore inform technicians that they should consider wearing surgical or utility gloves when handling unclean mouthpieces and cleaning instruments.
- Recommend that technicians who come in contact with body fluids while cleaning instruments should wear eye protection and face masks to keep splashing to a minimum.
- Advise technicians and educators to have their own mouthpieces and reeds for use when working on instruments other than their own.
- Suggest that retailers have customers pre-rinse with Listerine prior to trying a mouthpiece or instrument to reduce bacterial counts or spread through aerosols.¹³ Better yet, suggest musicians use their own mouthpieces when trying a new instrument.
- Retailers should be made aware that individuals with visibly active cold sores, severely chapped lips, or upper respiratory infections not be allowed to test mouthpieces or instruments.
- Remind repair technicians that puncture wounds and other injuries to the skin should be washed with soap and water and also to flush mucous membranes with water.⁵
- Suggest technicians keep an Occupational Safety and Health log. The purpose of the log is to record incidents involving punctures or cuts while repairing instruments. In turn, it will serve to support workers' compensation claims and track time loss due to injuries.¹⁴
- Promote prevention by recommending your clients keep all vaccinations current. This is a simple but effective means to break the chain of disease transmission.

CONCLUSION

Music professionals have long relied on trust, but this is insufficient when it comes to their own or the public's health. Currently, a universal disinfectant does not exist, and there are no hard and fast rules for disinfecting in the music environment. In the meantime, dental hygienists can take an active role by advocating further research on compatible disinfectants for mouthpieces and instru-

Hand hygiene is key to minimizing the transfer of pathogens. It is considered the single most critical measure for reducing the risk of disease transmission.

ments, by instructing clients to not settle for inferior products, by educating them to the risks of improper disinfection procedures, and by assisting them in making informed decisions about the products they use. Disease transmission is an insidious process and as dental health professionals, dental hygienists have an ethical and legal responsibility to protect the public from potential risk factors in any environment.

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2004 **Oral-B** Health Promotion Awards Have Dental Hygienists Extending Their Reach

THE COMMON FACTOR THAT LINKED ALL THREE OF THE 2004 *Oral-B Health Promotion Awards* winners was their commitment to helping those in need. Across oceans, into communities and on the street, individuals, associations, and schools ventured to bring their unique approach to oral hygiene awareness.

“What this year’s candidates demonstrated was a realization that a dental hygienist’s job is not only to educate, but to inspire,” remarked Susan Ziebarth, Executive Director of the CDHA.

Contestants across the country competed for \$5,000 in prize money, but what winners received in the end was more valuable than cash, according to Michele Christl, Business Manager for Oral-B Professional Products Group in Canada. “The past year has been a chance for existing and future hygienists to show their creativity,” said Michele. “It also allows them to highlight their devotion to the profession.”

WINNER IN THE SCHOOL CATEGORY: SCHOOL OF DENTAL HYGIENE, UNIVERSITY OF MANITOBA

There’s more than one way to get clients to open wide, and when those people are hungry and homeless, a bowl of soup works nicely. In their third year conducting the *Soup Up Your Smile* initiative, students at the School of Dental Hygiene at the University of Manitoba are learning



a little more each time. Their commitment to bringing oral-hygiene awareness to visitors of some of the busiest soup kitchens in Winnipeg may have had students learning as much as they taught.

The event was as fulfilling as it was eye-opening. Initial fears of what they might encounter were quickly forgotten amidst the realization that if it weren’t for the students, citizens of their own city might otherwise be forgotten.

During the two-day event, guests received over 300 care packages, 20 prizes, and 18 personalized oral-hygiene consultations. The students’ unique approach to dealing with those who don’t just need reminders to care for their teeth, but may simply not have a place to do so, was met with an unexpected level of interest.

Many guests wanted to later discuss and learn more about relevant topics such as smoking and your mouth,

Soup Up Your Smile volunteers



where to go and how to pay for dental care, tooth emergencies, and oral piercings. A recurring theme that prevention is more important and less expensive than treatment was a practical piece of advice for this audience, especially.

The highly organized approach was made possible with class-wide input on promotional strategies. By dividing themselves into three separate teams—promotions, screening, and learning-station—the students ensured every aspect of the event was covered.

For two days, students forgot about graduation, careers, and income realizing that dental hygienists have more than just a day job. The humbling experience was all the reassurance they needed to confirm that they chose the right profession.

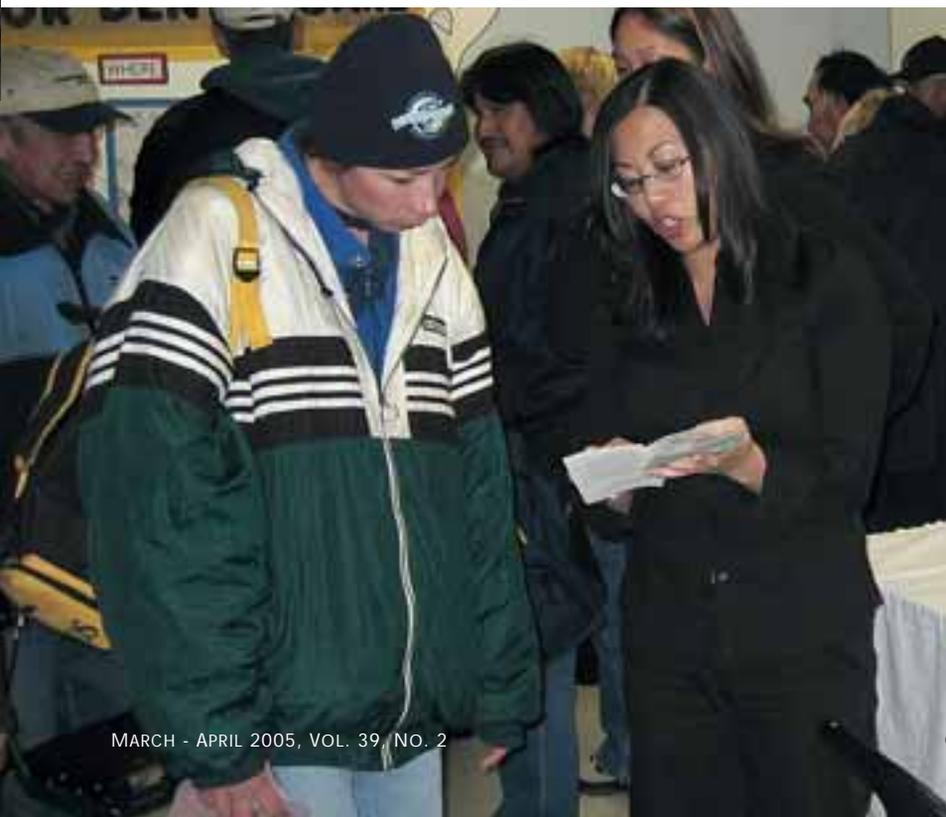
WINNER IN THE CLINIC/SOCIETY CATEGORY: OTTAWA DENTAL HYGIENISTS' SOCIETY, ONTARIO

Had anyone seen Charlene Van Hofwegen packing her car the first day of National Dental Hygienists Week 2004, they wouldn't have known what to think. With the help of her husband, the NDHW volunteer coordinator managed to cram hundreds of toothbrushes and brochures, a giant set of teeth and matching oversized toothbrush, a full-size molar costume, and many other things into her car for display in a busy west-end Ottawa shopping mall.

Taking what her group, the Ottawa Dental Hygienists' Society (ODHS), had learned from their first presentation in 2003, Charlene wanted to make this year even better. Using CDHA's capacity for providing liability insurance and contract assistance,* she could then focus on securing donations on a larger scale. With a long list of offerings in the end, her efforts were clearly a success. All helped fill her order of over twice the amount of supplies as the year before.

And it was a good thing because interest in the kiosk was better than expected. Many stopped by to pick up multilingual fact sheets supplied by Ottawa Public Health Project Officer Wanda Staples. Her foresight ensured the area's population as a whole would receive these important oral-health

* *Editor's note:* CDHA can arrange liability insurance coverage for members wishing to host education events in public places.





Wendy Taylor and young friends in Turkey

Sosnowski, Gail Cooper, Marie-France Bourgon, Sue Chinkiwsky, Kathleen Feres-Patry, Trish Sheppard-Serkeyn, and Catherine Taylor-Kelly, the celebration of National Dental Hygienists Week in the capital went off without a hitch.

**WINNER IN THE INDIVIDUAL CATEGORY:
WENDY TAYLOR, NEW BRUNSWICK**

Determined to do her part to combat substandard oral hygiene on a global scale, Wendy Taylor decided to begin her quest in a village where she lived at the time. After recruiting a friend with experience relating to multinational lifestyles, the dental hygienist chose an international school in Zekeriyaokoy, Turkey, as her starting point. Wendy's initial goal to focus on Turkish children was quickly extended to include all students—and their parents—regardless of their background.

To prepare for the event, Wendy gathered allies from previous oral-hygiene talks and volunteer efforts. Without hesitation, pedodontist Dr. Timucin Ari and orthodontist Dr. Umut Dogan both agreed to take part in this worthy educational undertaking.

The presentation to preschool and primary school-aged children covered tips on proper brushing and flossing, what to expect in the dentist's office, and how to choose healthy snacks. To ensure the messages were delivered as clearly and memorably as possible, Wendy cleverly arranged for an interactive atmosphere to engage the children.

A PowerPoint presentation complete with colourful visuals, a highly involved question-and-answer period, and age-specific take-home information packages all helped reinforce the importance of a healthy mouth at a young age.

As if that wasn't enough, a creatively written skit provided both a strong mental image and a few good chuckles. The theatrical portion of the day was brought to a conclusion with the children frantically brushing down Wendy, "the evil sugar bug," to rid her of sweets.

Without knowing it, the children learned not only to associate oral care with fun, but to look at dental hygienists and dentists as their friends. Wendy and her associates made many friends that day as they were presented with flowers and, oh yes, even chocolate for a job well done.

To this day, Wendy is still recognized in the village as "the tooth lady" or "the sugar bug," demonstrating just how unforgettable the experience was.

Any of these inspiring stories could be yours. As you develop your own unique approach to dental hygiene this year, keep track of what you've done. The pictures and anecdotes you collect will help convey the effort you or your team have put forth and may even win you recognition during the *2005 Oral-B Health Promotion Awards* this fall. A call for submissions and instructions on how to obtain your free Oral-B Health Promotion Award Kit will appear in an upcoming issue of *CJDH*. 

messages. By including material not only in French and English but also in Arabic and Somali, the Society's commitment to addressing growing areas of concern was evident.

While there, visitors received a surprise visit by Ms. Molar thanks to fellow team members. With an extra-large, plush grinder marching around and prizes being raffled off, the ODHS made it impossible for shoppers to ignore the set-up.

Thanks to the help of others like Kathy Sabourin, Elaine Falla, Debbie Hurda, Janet Munn, Barb Devries, Trish

U.S. Study on the Professional Practice Environment of Dental Hygienists

This new American study was carried out by the Center for Health Workforce Studies provides solid evidence that an increase in the Dental Hygiene Professional Practice Index (DHPPI) is positively correlated with a number of indicators of utilization of oral health services and oral health outcomes. The DHPPI includes such issues as the legal and regulatory environment; supervision in different practice settings; tasks permitted under varying levels of supervision; and reimbursement. To quote from the study's Executive Summary, "the findings of this study, when taken in conjunction with the findings based on study of initiatives in California and Colorado, suggest that expanding the professional practice environment of DHs improves access to oral health services, utilization of oral health services, and oral health outcomes." The report can be viewed on-line at <http://bhpr.hrsa.gov/healthworkforce/reports/hygienists/dh1.htm>.

Respecting the Air We Breathe: A Canadian Public Health Association Project

This recently finished project "was conceived to examine young adults as a target audience and to develop messages that would educate young adult smokers and non-smokers" about second-hand smoke—their responsibilities and their rights. Findings indicate that work among young people needs to be undertaken expediently to reduce the "social acceptability of second-hand smoke."

For more information—including the final report, visit the CPHA website at www.cpha.ca/programs/Rawb_v4/index.html.

Community water fluoridation

January 25, 2005, marks the 60th anniversary of the first community water fluoridation in the world. Grand Rapids, Michigan, was the pioneer in this regard. As part of the 60th anniversary celebration, the American Dental Association, together with the U.S. Centers for Disease Control and Prevention, are hosting a national fluoridation symposium in Chicago July 13–16, 2005.



CE Solutions' Incentive to Donate to the CDHA Foundation

CE Solutions, a professional development provider based in Ottawa, started a fundraising incentive for the new Canadian Foundation for Dental Hygiene Research and Education at the 1st RDH Fall Rhapsody, held last October during NDHW. The \$300 we raised in donations motivated us to continue this fundraiser. As an incentive, when \$25 or more is donated, the donor receives a very attractive rhinestone RDH pin. CE Solutions believes in the Foundation and is absorbing the cost of the pins. All the dental hygienists across Canada are invited to support this very important cause. All donors will be recognized on the CE Solutions website. These pins can be obtained by making a donation at our professional development events in your area (the 2nd RDH Fall Rhapsody will be held in Markham, Ontario, on October 21 and 22) or by mailing a donation to CE Solutions, 115 Dalecroft Cres., Ottawa, ON K2G 5V8. Inquires can be e-mailed to cesolutions@rogers.com or just give Nancy Simpson Smith, RDH, a call at 613-224-0891. 

Probing the Net

by CDHA Staff

TWO GATEWAY OR PORTAL SITES FOR ETHICS START OFF this issue's selection of interesting (we hope) web-sites. Then comes one URL for a downloadable document on surgical magnification. After this, we switch to children's oral health with a collection of sites that can assist the dental hygienist or that can be recommended to parents of children and adolescents.

Ethics – Useful Links. Canadian Institutes of Health Research (CIHR)

www.cihr-irsc.gc.ca/e/6427.html

Under the CIHR's Values and Ethics Section is a good resource for material and links regarding ethics. Guidelines for Health Research (including Tri-Council Policy Statements, international ethical guidelines, conventions, and declarations); Relevant Agencies & Organizations; Academic BioEthics and Health Law Centers/Institutes; Bioethics Information Resources on the WEB.

Ethics – MedWebPlus

medwebplus.com/subject/Ethics?oc=0&cc=oc

This site is a "free service to help you find health sciences information quickly and easily." This URL is an extensive listing of websites, newsletters, journals, and institutes among others dealing with ethics.

Magnification Use in Dental Hygiene (ADHA)

www.adha.org/downloads/sup_magnification.pdf

This 9-page document is a single-topic supplement published by the American Dental Hygienists' Association. It gives a good overview of surgical magnification and the elements that need to be assessed when deciding on loupes.

National Maternal and Child Oral Health Resource Center (OHRC)

www.mchoralhealth.org/Toolbox/index.html

This American resource center is funded by the U.S. Maternal and Child Health Bureau, Health Resources and Services Administration, Department of Health and Human Services. "OHRC supports health professionals, program administrators, educators, policymakers, and others with the goal of improving oral health services for infants, children, adolescents, and their families;" its aim is "to gather, develop, and share quality and valued information and materials." The Bright Futures Oral Health Toolbox has much of interest to dental hygienists regarding their discussions with parents about children's oral health. Under the subsection Families are Materials and Links for Parents, Materials and Links for Children and Adolescents. Documents available online include colouring books; brochures on topics such as smart snacking, sports safety, and wisdom teeth. There are a large number



of fact sheets for parents on topics such as "Baby Bottle Tooth Decay," "Thumb Sucking and Pacifiers," and "Teething and Dental Hygiene." This is a large but very well-designed site that will be interesting to explore. The subsection for Health Professionals and Human Services Providers includes screening/risk assessment tools, lists of journal articles, and anticipatory guidance tools.

Caring for Kids – Canadian Paediatric Society

www.caringforkids.cps.ca/healthy/index.htm

This site, developed by the Canadian Paediatric Society, has information for parents in a clear, well-organized, and user-friendly site. Major sections include *Pregnancy & babies*, *When your child is sick*, *Keeping your child healthy*, *Teen health*, *Immunization*, *Behaviour & development*, *Healthy eating*, and *Keeping kids safe*. There are sections on reading, dealing with disasters, product recalls, and health warnings. The *Keeping your child healthy* has items such as "Fluoride and your teeth" as well as "Smoking and your child." A reputable site to recommend to parents for good advice.

Ontario Association of Public Health Dentistry

www.oaph.on.ca/index.phtml

A very good resource manual for teachers can be downloaded from this site. And dental hygienists are teachers, promoting good oral hygiene to clients of all ages. Clear definitions, good illustrations, and plain language aimed at the layperson—all this contributes to an excellent source of reliable information on a wide range of subjects. Chapters include Oral Anatomy; Tooth Decay; Periodontal (Gum) Disease, Dental Nutrition; Prevention of Dental Disease; Personal Safety and Injury Prevention; Miscellaneous (tongue piercing, oral cancer).

Wisdom Tooth Home Page, School of Dental Hygiene, University of Manitoba

<http://www.umanitoba.ca/outreach/wisdomtooth/>

A site aimed at parents and children – illustrations and information in a number of sections such as Wisdom Teeth; Brushing Tips; Flossing Tips; What Is a Dental Hygienist?; Oral Health Concerns (dental x-rays, sports and mouthguards, orthodontics, pregnancy gingivitis, tooth grinding, sensitivity, tongue piercing, etc.), Tips for Parents (baby's first tooth, teething troubles, thumb-sucking, pacifiers, etc.)

CLASSIFIED ADVERTISING

CDHA and *CJDH* take no responsibility for ads or their compliance with any federal or provincial/territorial legislation.

BRITISH COLUMBIA

GRAND FORKS (KOOTENAYS) Hygienist needed in Grand Forks, B.C., 5 minutes from U.S. border in the beautiful "Sunshine Valley." Excellent outdoor recreation (skiing, hiking, golfing, etc). We run a low-key, easy-going practice (AND PROUD OF IT). Work 4 days a week 8:30 – 4:30; no weekends or evenings. We are liberal about time off, extra days, etc. Willing to help find accommodations. Competitive wages. A 10-year practice, Dr. Peter Bush. Contact Kim: days, 250-442-3741; evenings, 250-442-0075. Fax: 250-442-0213.

KELOWNA Hygienist needed to fill MAT leave starting ASAP for approximately 1 yr. Focus is on high-quality work in a fun, established office. Position is 2–3 days/wk. Please fax résumé to 250-762-8072.

SALMON ARM Self-motivated, enthusiastic, and friendly dental hygienist required to join our busy family practice located in the charming mountain community of Salmon Arm, B.C. If you are searching for a fun and caring dental team, low-stress lifestyle, year-round recreation, moderate lakeside climate, and spectacular scenery, please contact Lorie for more information. E-mail: dljurasek@telus.net or call 250-833-4777.

ALBERTA

COLD LAKE Long-established family practice currently seeking a personable and compassionate Registered Dental Hygienist, with excellent communication skills, to join our Hygiene Department. This is a perfect opportunity for experienced hygienists and conscientious new grads. If you're looking to provide exceptional patient care, with an office that truly appreciates its team of professionals, contact Kelly Avery at Tri-Town Dental Centre, Box 1710, Cold Lake, AB T9M 1P4. Tel: 780-594-5984; fax: 780-594-5965.

EDSON Family practice requires a committed dental hygienist—energetic, hardworking, team-oriented, and ambitious with interpersonal attributes and exceptional clinical skills. A vision for developing and implementing a hygiene program; a patient educator. Salary or commission negotiable, depending upon experience. Edson, 200 km west of Edmonton, is a vibrant, growing, rural community with ample employment opportunities for a partner. Contact Dr. Shariean Robinson, P.O. Box 7229, Edson, AB T7E 1V5. Tel: 780-723-5221(w), 780-723-3084(h); fax: 780-723-2402(w); e-mail: srobin11@telus.net.

SLAVE LAKE Dental hygienist wanted to join a fun, team-oriented dental practice. This is a great opportunity to experience the "Alberta Advantage." Slave Lake sits on the largest lake in the province, providing many outdoor opportunities and is one of the fastest growing communities in Alberta. Hours are flexible; salary is

very competitive. There will be one dedicated hygiene operator. Fax résumés to 780-849-3322, Attn: Terri. Or, for more information, call 780-849-2233 and ask for Terri. E-mail: slavelakedental-clinic@snipercom.net.

ROCKY MOUNTAIN HOUSE LOCATION, LOCATION, LOCATION!! If you are looking for a change, Rocky Mountain House has it all. Our staggered 4-day work week provides alternating 2- and 4-day weekends, a perfect blend of work and time for yourself. We offer very competitive wages and benefits. This permanent full-time position will complement our friendly staff of 10. Call us!!! Contact Ruth at 403-845-3111 or fax your résumé to 403-845-7610.

SASKATCHEWAN

MELFORT If you want the lifestyle of a small town, with the advantage of being 1½ hours away from a major airport and close to breathtaking lake country, our very busy, progressive office requires a full-time dental hygienist. New building, new equipment, great staff, competitive salary. Don't let this opportunity pass you by. Please send résumé to Melfort Dental Group, Box 3129, Melfort, SK S0E 1A0, Attn: R. Carlson, or fax it to 306-752-5994.

ONTARIO/QUEBEC

Dr. Luc Leboeuf & Associates: Full- or part-time dental hygienist required in one or two Ontario offices (Cornwall or Hawkesbury-Alfred), and a third office is located in Valleyfield, Quebec. Please note that you may choose to work in only one office. Flexibility, stability, and pleasant work environment. Schedule and salary to be discussed. Fax résumé to 450-267-1515.

NOVA SCOTIA

INVERNESS Full-time/part-time dental hygienist required for busy dental practice. Great hiking, cycling, golfing, swimming, and more. Enjoy working in a bright spacious office overlooking the beautiful Gulf of St. Lawrence. Benefits include competitive salaries, bonus incentives, RRSP contributions, and assistance with student loan payments. Please fax or mail résumé to Tri-Harbour Dental Corp Ltd, PO Box 488, Inverness, NS B0E 1N0. Fax: 902-258-2223; telephone: 902-258-2900.

INTERNATIONAL

GERMANY, Nuremberg Our office operates all facets of its dental care center with focused team energy for excellence in treatment of the whole patient. We strive to provide a level of care that encompasses every dimension of the patient's well-being, technologically and in the human arena. Do you have the same goals? Then don't hesitate to apply for a job opportunity in one of Germany's most beautiful cities. We offer a 36 hours-per-week-contract, 4 weeks of vacation, and a salary between 30-36K EUR (=39-47K US\$) per year depending of your working experience. Minimum contract length: one year. No German required. Please contact us at Grolandstasse 30, Nuremberg, Germany, 90408. Tel: +49-172-8111-946; e-mail: DrRado@aol.com; website: www.zaan.de.

OTHER

GEORGE BROWN COLLEGE 1980 graduates' 25th Reunion, Friday, May 6, 2005. Contact theresadietrich@rogers.com or cmbarlow@georgian.net.

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CDHA CLASSIFIED ADS

Classified job ads appear primarily on the CDHA's website (www.cdha.ca) in the Career Centre (*Members' Only* section). On-line advertisers may also have their ad (maximum of 70 words) listed in the journal *CJDH* for an additional \$50. If an advertiser wishes to advertise only in the print journal, the cost will be the same as an on-line ad. These classified ads reach over 11,000 CDHA members across Canada, ensuring that your message gets to the target audience promptly. Contact CDHA at info@cdha.ca or 613-224-5515 for more information.

