

JOURNAL

of the California Dental Hygienists' Association

Volume 27
Number 2

Summer 2011



Local Anesthetic Agents in Review

*A Review of the Current Options
for Dental Hygienists*

*Working Pain-Free
The Alexander Technique*

PracticePointers

Incisive Blocks – simple, fast and very useful

“A much
easier way
to clean
between
teeth.
I love it.”

– Michelle Hurlbutt, RDH, MSDH

PHILIPS
sonicare



Experience Breakthrough Innovation: Philips Sonicare AirFloss

Patients who just won't floss will love the new Philips Sonicare AirFloss. Its innovative microburst technology delivers a quick burst of air and microdroplets for a gentle yet powerful clean in-between.

Effective: Sonicare AirFloss gently and effectively helps improve interproximal gum health in just two weeks¹

Easy to use: Reported easier to use by 86% of patients surveyed²

Preferred: After one month, 96% of patients who flossed inconsistently used Sonicare AirFloss at least four times per week³

Call 1-800-676-SONIC (7664) to schedule an in-office Lunch & Learn.
sonicare.com/dp

¹ de Jager M, Jain V, Schmitt P, DeLaurenti M, Jenkins W, Milleman J, Milleman K, Putt M. Clinical efficacy and safety of a novel interproximal cleaning device. *J Dent Res* 90(spec iss A), 2011

² Krell S, Kaler A, Wei J. In-home use test to evaluate ease of use for Philips Sonicare AirFloss versus Reach string floss and Waterpik Ultra Water Flosser. Data on file, 2010

³ Krell S, Kaler A, Wei J. In-home use test to assess compliance of Philips Sonicare AirFloss. Data on file, 2010

PHILIPS
sonicare

sense and simplicity

In this issue of the

JOURNAL

of the California Dental Hygienists' Association

Summer 2011

- 3 **From the Editor's Desk**
The Power of Pain
- 4 **CDHA House of Representatives**
25th Annual Meeting Highlights
- 5 **President's Message**
Reflections from President Ellen Standley
- 13 **PracticePointers**
The Horizontal Incisive Block
- 17 **StudentConnection**
2011 CDHA SHOR Highlights
- 20 **StayingHealthy**
The Alexander Technique
- 22 **CareerCorner**
The Evolving Career of a Dental Hygienist
- 25 **EducationExchange**
Strategies for Maximizing Student Competence
- 28 **NewsBytes**
Information you can use today



20



Painting by Jane W. Ferguson. Artist profile on following page.

Lifelong Learning
Local Anesthetic Agents 6



13

28



CDHA thanks  for their generous sponsorship of this issue



California Dental Hygienists' Association
The Voice of Dental Hygiene

Contributions of scientific and original articles. The Journal of the California Dental Hygienists' Association is formatted by and published under the supervision of the Editor. The opinions expressed or implied in this publication are strictly those of the authors and do not necessarily reflect the opinion, position or official policies of the CDHA nor are claims or statements by authors verified.

The only permission granted for photocopying or storage of items is for personal use, or the use by libraries; all other uses require the written permission of the Editor or President. CDHA reserves the right to illustrate, reduce, revise or reject any manuscript submitted. Articles are considered for publication on condition they are contributed solely to the Journal. Contributors are notified within 90 days if a manuscript is accepted for publication.

Correspondence should be addressed directly to the Editor:

Cathy Draper, RDH, MS

E-mail : Drapercatherine@foothill.edu

FAX: 408-252-4350

Mail: 1310 Regency Drive • San Jose, CA 95129

Display and classified advertising. The California Dental Hygienists' Association does not assume liability for contents of advertisements. Inquiries regarding display advertising should be directed to:

Shanda Wallace, RDH

611 Bristol Ave. • Stockton, CA 95204

Shandawallacerdh@comcast.net

info available @ cdha.org

Copyright ©2011 by the California Dental Hygienists' Association. The *Journal* is published on a regular schedule by the California Dental Hygienists' Association. Subscription rate is as follows:

\$15 for CDHA members

\$25 for non-CDHA members and ADHA members within U.S.

\$50 to ADHA members outside the U.S. and non-members within the U.S.

All change of name or address should be sent to:

California Dental Hygienists' Association

130 North Brand Boulevard, Suite 301

Glendale, CA 91203

Phone: 818-500-8217 FAX: 818-247-2348

E-mail: info@cdha.org

Internet: <http://www.cdha.org>

JOURNAL

of the California Dental Hygienists' Association

2010–2011 Executive Officers

President	Lisa Okamoto, RDH, AS
President Elect	Susan Lopez, RDH, BS
VP Membership & Professional Development	Terri Vosper, RDHAP, BA
VP Administration & Public Relations	Karine Strickland, RDHAP, BS
Secretary-Treasurer	Lygia Jolley, RDH, BA
Immediate Past President	Ellen Standley, RDH, BS, MA
Executive Administrator	Rosie Tesselaar

Component Trustees

Central Coast	Tracy Woods-Boyan, RDHAP	San Fernando Valley	Kirsten Thye, RDH
East Bay	Tresa Irby, RDH	San Francisco	Michael Long, RDH
Kern County	Harriet A. Luzinas-Smith, RDH	San Gabriel Valley	Beverly Legg, RDH, MS
Long Beach	Beth Strauss, RDH	San Joaquin Valley	Fred Thomas, RDH
Los Angeles	Tricia Osuna, RDH, BS, FAADH	Santa Barbara	Alexandra Major, RDH
Monterey Bay	Mary Jo Cardinale, RDH, BS	Santa Clara Valley	Jocelyn Weinhagen, RDH, BA
Mt. Diablo	Frannie Driscoll, RDH, BS	Shasta	Kendra Edwards, RDH
Napa-Solano	Ivy Zellmer, RDH	Six Rivers	Eva Adams, RDH
Orange County	Rhonda McMorrin, RDH	South Bay	Carole Broder, RDH, BS
Peninsula	Angela Punaro, RDH	Tri County	Darlene Cheek, RDH, MPH, BS
Redwood	Tamara Wells, RDH	Valley Oaks	Michelle Gray, RDH
Sacramento Valley	Carol Lee, RDH, BS	Ventura County	Erica Johnson, RDH
San Diego County	Jackie Buchanan, RDH		

Journal Staff

Editor	Cathy Draper, RDH, MS
Advisory Board	Toni S. Adams, RDH, MA Carol Lee, RDH, BS Donna Smith, RDH, MSEd
Graphic Design	Dorreen P. Davis
Printer	Moore Bergstrom Co.

Calendar of Events

August 27, 2011	Summer BOT Meeting, Glendale CA
October 29, 2011	Fall CE Extravaganza San Mateo, CA
October 30, 2011	Fall BOT Meeting San Mateo CA

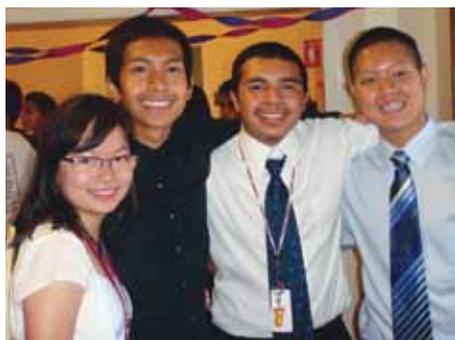
About the Cover Art: "Reclaimed Land" is from an original acrylic on canvas created by Cupertino artist Jane W. Ferguson. After a long career in nursing, Jane changed direction in 1994 to become a full-time artist. Her artwork can be seen at The Viewpoints Gallery in Los Altos, The Kaleid Gallery in San Jose and at www.janewferguson.com

THE **Power** OF **Pain**



For the past 5 years, I have been a mentor in the Stanford Medical Youth Science Program, a residential program for low-income, minority high school students who have an interest in science and health care. As a mentor, you provide one-on-one support for a student during the 6 week summer program, with the goal of developing a lasting relationship with your mentee. Recently, I mentioned to the program coordinator that I would like to give an oral health presentation to the students. While he thought the idea was good in theory, he said that it would be difficult to generate much enthusiasm for an evening program on oral health. "I hope you don't take this personally, but it's hard for these students to get excited about a topic that evokes fear and is associated with pain," he confided to me. His comments gave me real pause as I reflected on the role pain and fear play for the patients that we see on a daily basis, and those we never see. As dental hygienists, we focus on promoting optimal oral health and preventing oral disease. We don't often think of ourselves as being capable of eliciting fear in the patients we treat. While there is substantial evidence that fear of dentistry is related to poor oral health and the avoidance of dental treatment, it has also been reported that fear of pain and discomfort during subgingival instrumentation deters at least 10% of the population from seeking care.^{1,2}

The issue of pain control also becomes more complex when you consider the anxiety surrounding administering the local anesthetics designed to eliminate pain. Needle phobia and the associated fear of injections has recently been classified as a bona fide medical condition that affects individuals around the world.³ Anxious patients are also more likely to suffer from physiologic changes in their blood pressure, heart rate and stress hormone levels which in turn puts them at higher risk of medical emergencies related to vasovagal/fainting reactions.



Students in the SMYSP

The focus of this issue of the *CHDA Journal* is pain. Whether you are a clinician, educator or a student, you will find timely information on anesthetic options, techniques and ergonomics to incorporate into your daily practice. Our ability to provide effective pain control can improve the outcomes in the care we deliver and ultimately change the public's perceptions about oral health and dental treatment.

Perception changes can only come, one patient at a time. Maybe next year I will be able to bring my oral health presentation to the Stanford Medical Youth Science Program.

1. Armfield JM, Milgrom P. A clinician's guide to patients afraid of dental injections and numbness. *SAAD Dig.* 2011 Jan; 27:33-9.
2. Kumar PS, Leblebicioglu B. Pain control during nonsurgical periodontal therapy. *Compend Contin Educ Dent.* 2007 Dec; 28(12):666-9.
3. Chester J. et al. Needle phobia: etiology, adverse consequences, and patient management. *Dent Clin N Am* 2010 (54):731-744.

Cathy
Cathy Draper, RDH, MS
Editor

CDHA House of Delegates



"As dental hygienists and members of our professional association, we have the opportunity to connect with a wider circle of people and extend our reach, creating larger ripples. We are affected by all these connections and we grow, both professionally and personally." ~ Lisa

The 25th annual House of Delegates of the California Dental Hygienists' Association was held June 4 – 6, 2011, at the Disneyland Hotel in Anaheim. Over 400 members, delegates and students met for a weekend of continuing education, networking and deliberation to set the course for CDHA for the coming year.

Highlights of the session included:

- Continuing education programs on "Adopt a Skilled Nursing Home Facility", an all inclusive program for implementing an oral health in-service program for skilled nursing home care providers
- "Paper Persona: Stand Out", a step by step guide to highlighting case studies, best practices and evidence based care via a professional portfolio.
- Discussion forums for students and professionals on the current dental hygiene workforce and the vision for an advanced, mid- level dental hygiene practitioner in California.

The House of Delegates adopted a budget for the coming year that included investing in a web site redesign that will help facilitate our mission and goals. Membership for all licentiates and the advocacy of direct access to the services of registered dental hygienists in all roles and practice settings were added to the goals of the association. The delegates adopted definitions for cultural and linguistic competence and health literacy to support future association policy. The delegates also elected the slate of CDHA officers and ADHA delegates for 2011-2012.

A full report of the actions of the 2011 CDHA HOD can be found at www.cdha.org.



Association leader, author, lecturer, cartoonist and humanitarian, Noël Kelsch, RDHAP, (left) recipient of the 2011 President's Recognition Award with outgoing CDHA President, Ellen Standley (right).

"With oral health listed as one of the single greatest unmet health needs in the US in 2011, dental hygienists have an incredible opportunity to truly affect change. I call on each one of you to help us determine the path that California hygienists envision for our profession." ~ Lisa



CDHA officers (From left to right): Speaker of the House, Lin Sarfaraz, RDH, AS; Secretary-Treasurer, Lygia Jolley, RDH, BA; VP of Administration and Public Relations, Karine Strickland, RDHAP,BS; President, Lisa Okamoto, RDH; Immediate Past President, Ellen Standley, RDH, MA; VP of Membership and Professional Development, Terri Vosper, RDHAP, BA; President Elect, Susan Lopez, RDH, BS



Lisa Okamoto, RDH receives her CDHA President's pin from her husband, Bob.

Message from the President

Let Your Voice be Heard!

The California Dental Hygienists' Association is "**The Voice of Dental Hygiene.**" CDHA represents dental hygienists in California and acts in the best interest of the entire profession. As an association we have a stronger voice and are able to be heard in all the key places affecting advocacy, standards of practice, access to care and oral health promotion. Members and non-members alike benefit from the voice of CDHA. While the collective voice of the association is pivotal for the strength of our profession, the voice of each individual hygienist is of critical importance.

As an individual, your opinions impact our profession. Never let it be said that the voice of the individual does not make a difference. Even if your voice is in the minority, it is important to express your thoughts and share your viewpoints. There are many avenues to make your voice heard in your local community as well as at the state and national level.

Active participation and finding your voice are easier than some people think. The first step is the most difficult. Start small. Send an e-mail, write a letter or deliver oral commentary to those setting policy. Leadership positions are another avenue for finding your voice. Many members are reluctant to step into leadership roles due to perceived time constraints. The local component welcomes your participation and understands outside obligations. Sharing leadership roles and communicating electronically are solutions tailor-made to accommodate busy schedules.

Consider volunteering for community events such as health fairs, varnish or sealant clinics, screenings, oral health presentations or even serving as a liaison on a health advisory board or committee. Your presence can help create a bridge between the dental hygiene profession and the public.



From the grass roots components to the state level, the actions and presence of our members makes a powerful impact. I encourage each one of you to find your voice and make a difference. **The Voice of Dental Hygiene** will move our profession forward.

It has been an honor and a pleasure to serve as the President of CDHA this past year. The support, talent and friendship of my colleagues and fellow leaders helped me maximize many opportunities.

I would like to ask you to join me in welcoming Lisa Okamoto as our 2011-2012 CDHA President.

Warm regards,

Ellen Standley, RDH, BS, MA
2010-2011 CDHA President



Local Anesthetic Agents: – A Review of the Current Options for Dental Hygienists

Introduction

Dental hygienists have been administering local anesthetics for over forty years to treat patients with painful gingival and periodontal infections. Local anesthesia has been an important addition to the dental hygiene scope of practice for nonsurgical periodontal therapy. However, today the administration of local anesthetics by dental hygienists has evolved beyond that needed primarily for periodontal therapy. It has been reported that many dentists delegate the administration of local anesthesia to the dental hygienist, thus resulting in positive practice productivity outcomes.¹ Moreover, many dental practices may hire a dental hygienist exclusively to provide local anesthesia for all the patients in the practice.^{1,2} Much like nurse anesthetists or anesthesiologists who specialize in pain control, so do dental hygienists who specialize in the administration of local anesthesia without providing any other traditional dental hygiene services.²

Local anesthetics have evolved into the safest drugs used in medicine for pain management and they are the most commonly used drugs in dentistry. The administration of local anesthesia by the dental hygienist has grown to be an integral component of dental hygiene practice with few, if any, adverse reactions. However, to ensure continued safety, the selection of a local anesthetic agent should be carefully determined by the dental hygienist in consultation with the dentist and the patient's physician, taking into consideration the individual patient assessment and the dental or dental hygiene care plan. Additionally, other characteristics including the anesthetic's efficacy and safety, the necessary duration of pain control, postoperative pain control issues and the need for hemostasis should also be considered when selecting a local anesthetic.

Upon completion of this course, the dental professional should be able to:

- List the local anesthetics commonly used in dentistry
- Give the onset of action and duration of the commonly used local anesthetics in dentistry
- Discuss the role of buffering in local anesthetics
- Describe the process for reversing the effects of local anesthetics

History of Local Anesthetics

The first local anesthetic, cocaine, was isolated from coca leaves by Albert Niemann and Francesco Di Stefano in Germany in the 1860s.³ Although very effective as an anesthetic, cocaine is highly addictive, and many of the pioneer researchers who studied its effects on themselves became addicted.⁴

German researchers created procaine, commonly known as novacaine, an ester compound, in 1905. They found that procaine mixed with a proportion of epinephrine, while less potent than cocaine, was both safe and effective.⁵ The main disadvantages to procaine were its delayed onset of action and short duration. Additionally, it was later discovered that there was a greater propensity of patients who became hypersensitive to procaine due to the high potential for allergic reactions found in ester compounds.

In the 1940s a new group of local anesthetic compounds, the amides, were introduced. The first amide, lidocaine, was synthesized by Swedish chemist Nils Lofgren in 1943. Lidocaine revolutionized pain control in dentistry worldwide, primarily because it was more potent and less allergenic than procaine. In the succeeding years, three additional amide compounds, prilocaine, bupivacaine and mepivacaine, were introduced. The new amide compounds provided the dental practitioner with an array of options for local anesthesia lasting from 20 minutes with mepivacaine and up to 3 hours with bupivacaine. In 1969, Rusching and colleagues prepared a new drug, articaine, which differed in its molecular composition from the previous amide anesthetics. Re-named articaine in 1984, the drug was unique in that it contained a thiophene ring in its molecular structure instead of the usual benzene ring found in other amides. Widely used for many years in Europe and Canada, articaine in a 4%, 1:100,000 epinephrine formulation, was first approved for use in the United States in the year 2000.

In 2011, there are five generic classifications of amide local anesthetics available in North America for use in dentistry. These amide preparations come in various concentrations and are fabricated with or without vasoconstrictors. (Table 1 on next page)

Table 1: Summary of Amide Local Anesthetic Agents

Formulations and ADA Color Codes	Duration Pulpal Tissues (Minutes)	Duration Soft Tissues (Hours)	Half Life (Minutes)	Maximum Recommended Dose (mg/lb)	Absolute Maximum Dose (mg)
Lidocaine 2% Plain	5-10	1-2	96	2.0	300
Lidocaine 2% 1:100,000 epinephrine	60	3-5	96	2.0	300
Lidocaine 2% 1:50,000 epinephrine	60	3-5	96	2.0	300
Mepivacaine 3% Plain	20-40 (towards 40 with block)	2-3	114	2.0	300
Mepivacaine 2% 1:20,000 levonordefrin	60-90	3-5	114	2.0	300
Prilocaine 4% Plain	Infiltration: 5-10 Block: 40-60	Infiltration: 1.5-2 Block: 2-4	96	2.7	400
Prilocaine 4% 1:200,000 epinephrine	60-90	3-8	96	2.7	400
Articaine 4% 1:100,000 epinephrine	60-75	3-6	45	3.2	500
Articaine 4% 1:200,000 epinephrine	45-60	3-6	45	3.2	500
Bupivacaine 0.5% 1:200,000 epinephrine	90-180	4-9	210	0.6	90

Modified from: Logothetis DD, Local anesthesia for the dental hygienist. St. Louis: Elsevier; 2012.

Overview of Local Anesthetics

Lidocaine

Lidocaine, a xylidine derivative, was the first amide local anesthetic suitable for a nerve block in dentistry. Because of its reliability, lidocaine is currently the most commonly used local anesthetic solution in dentistry in the United States and is the standard of comparison for all other local anesthetics.²

Lidocaine is a potent vasodilator. As a result of this property, plain lidocaine offers pulpal anesthesia of only 5-10 minutes, and is rarely used in dentistry without a vasoconstrictor. However, when lidocaine is used in the common formulation of 2% lidocaine with 1:100,000 epinephrine, it provides profound pulpal anesthesia for approximately 60 minutes and soft tissue anesthesia for 3 to 5 hours. Lidocaine has a low risk for systemic toxicity and no documented allergic reactions.^{2,6} The higher vasoconstrictor concentration of 2% lidocaine with 1:50,000 epinephrine provides no additional pain control as compared to the 1:100,000 concentration and has the additional side effect of increasing the risk of adverse cardiovascular reactions.

Elderly patients are more likely to be hyper-responders to vasoconstrictors, and in these individuals the 1:100,000 dilution should be the anesthetic of choice.⁷ The 1:50,000 epinephrine formulation has the advantage of increased vasoconstriction and improved hemostasis and should be reserved for procedures requiring increased bleeding control.^{2,6} Lidocaine is metabolized in the liver through a complex metabolic pathway utilizing several hepatic enzymes. Therefore, lidocaine dosages should be reduced for patients with liver dysfunction and in patients taking medications that compete with lidocaine for hepatic enzymes.

Mepivacaine

Pharmacologically similar to lidocaine, mepivacaine is also a xylidine derivative. Mepivacaine is like lidocaine in its onset of action, duration, potency and toxicity. No allergic reactions have been reported with this drug. Mepivacaine is available in two different formulations: 3% mepivacaine plain, without a vasoconstrictor, and 2% mepivacaine 1:20,000 levonordefrin. Because mepivacaine alone produces less vasodilation than lidocaine, it can be an effective anesthetic even without a vasoconstrictor making it a reasonable local anesthesia alternative when the use of a vasoconstrictor is contraindicated. Mepivacaine plain is produced exclusively in the 3% formulation which is useful for short procedures and provides pulpal anesthesia of approximately 20 minutes via infiltrations, and 40 minutes via nerve blocks. Mepivacaine plain also provides 2 to 3 hours of soft tissue anesthesia and can be used in situations where profound pulpal anesthesia is not necessary.

The 2% mepivacaine formulation is the only anesthetic that is manufactured in the United States using levonordefrin as its vasoconstrictor. The 2% mepivacaine with levonordefrin provides an equivalent depth and duration of pulpal and soft tissue anesthesia when compared to lidocaine with epinephrine. Levonordefrin, however, does not provide the same intensity of hemostasis as epinephrine.² Like lidocaine, mepivacaine is metabolized in the liver and should be used with the same precautions as lidocaine in individuals with liver dysfunction or in individuals taking medications that compete with mepivacaine for hepatic enzymes.

Prilocaine

Pharmacologically, prilocaine is similar to both lidocaine and mepivacaine. However chemically, prilocaine is a toluidine derivative, while lidocaine and mepivacaine are xylidine derivatives. Prilocaine is equal in potency to lidocaine and mepivacaine but is only two-thirds as potent as articaine. Considered to be the least toxic anesthetic currently available, prilocaine exhibits minimal effects on the central nervous system and the cardiovascular

Continued on Page 8

system. When compared to lidocaine with a similar intravenous dose, the central nervous system toxicity following the administration of prilocaine was shorter and less severe.⁷

Similar to mepivacaine, prilocaine alone produces very little vasodilation and is an effective plain anesthetic. The duration of anesthesia with prilocaine plain is dependent on the type of injection administered. When a 4% prilocaine plain solution is administered as a block injection, it increases in duration from short to intermediate acting and can provide pulpal anesthesia for approximately 40-60 minutes and soft tissue anesthesia for approximately 2 to 4 hours.²

Prilocaine is especially effective when a longer duration of action is needed when compared to mepivacaine and lidocaine. Prilocaine plain has a slightly longer duration when compared to mepivacaine plain. Prilocaine with a vasoconstrictor concentration of 1:200,000 epinephrine has a slightly longer duration than that of lidocaine with 1:100,000 epinephrine. This formulation is useful for patients in ASA category III (severe systemic disease) who are epinephrine sensitive. The epinephrine concentration of 1:200,000 is half the potency of the 1:100,000 concentration; therefore patients with cardiovascular disease can receive twice as many cartridges of prilocaine with epinephrine as they can cartridges of lidocaine 1:100,000 epinephrine.²

While prilocaine, like lidocaine and mepivacaine, is metabolized in the liver, the process is eased due to the fact that a significant proportion of the drug is metabolized in the lungs and kidneys before reaching the liver.⁷ Prilocaine is metabolized into ortho-toluidine and N-propylalnine in the liver by the hepatic amidases. This process is of clinical importance when prilocaine is metabolized to ortho-toluidine, which can induce the formation of methemoglobin, thus leading to methemoglobinemia if large quantities of the anesthetic have been administered. Clinical cyanosis of the lips and mucous membranes can be observed due to prilocaine's ability to reduce the blood's capacity to carry oxygen. When doses of prilocaine exceed the maximum recommended dose, methemoglobinemia may result leading to respiratory and circulatory distress. This is a relative contraindication to the use of prilocaine, and minimal doses should be administered to patients at risk for methemoglobinemia or patients with oxegenation difficulties.

Articaine

Articaine in a 4% concentration in combination with 1:100,000 epinephrine was approved for use in the United States in 2000.² It is one-third as potent as lidocaine and relatively equal in toxicity to lidocaine and mepivacaine. It provides an intermediate duration of action with approximately 60-75 minutes of pulpal anesthesia and 3 to 6 hours of soft tissue anesthesia.²

Pharmacologically, articaine is derived from thiophene, making it unique from the other amide anesthetics. The thiophene derivation allows for articaine's increased lipid solubility. Another basic property of articaine that differs from the other amides is that it contains an extra ester linkage. This extra ester link enables articaine to be hydrolyzed by plasma esterase as well as enzymes in the liver so that 90 to 95% of articaine is metabolized in the blood and the remaining 5 to 10% is metabolized in the liver. Drugs metabolized in the blood have a shorter half-life compared with drugs metabolized in the liver, thus decreasing the risk for systemic toxicity. This process is clearly demonstrated when comparing the half-lives of articaine and lidocaine. The elimination half-life for lidocaine is 96 minutes as compared to 45 minutes for articaine. The major metabolite for articaine is articainic acid, which is inactive as a local anesthetic and has not demonstrated any systemic toxicity.² This property is of particular importance because an active metabolite may affect the drug's toxicity and exert undesirable side effects. In comparison to articaine, lidocaine has active metabolites. Due to articaine's rapid metabolism and its inactive metabolites, it is considered to be a safer drug to re-administer during dental treatment if the need for more anesthetic is necessary.²

Articaine's chemical formula contains a thiophene ring instead of the benzene ring found in amides. The thiophene ring is thought to give the molecule better diffusion properties when compared to lidocaine and the other amide anesthetics.⁸ Some articaine studies have demonstrated that pulpal anesthesia can occur in the dense bone of the mandible following a buccal infiltration due to the drug's bone penetration properties.^{9,10}

Since the FDA approved articaine in 2000, some clinicians have been concerned about frequent reports of paresthesia.^{7,8} Articaine is delivered as a 4% solution, whereas lidocaine is delivered as a 2% solution. The primary factor in neurotoxicity of local anesthetics appears to be the concentration of the solution; injuries increase as concentration increases, particularly with articaine.¹¹⁻¹³ However, the hypothesis that the paresthesia is due to the 4% articaine solution concentration is controversial.^{14,15}

Haas and Lennon analyzed the cases of paresthesia reported to major dental malpractice carriers in Ontario, Canada. The analysis of the data indicates that articaine has a 4% higher incidence of paresthesia when compared to the 2% or 3% formulations.¹¹ A more recent study of nonsurgical paresthesia in Ontario from 1999 to 2008, analogous to the Haas and Lennon study, yielded similar results.¹⁶ The most recent study by Garisto et al, analyzed reports of paresthesia from local anesthetics following dental procedures.

They looked at 1997-2008 data obtained from the U.S. Food and Drug Administration Adverse Event Reporting System, specifically at paresthesia after dental procedures using single anesthetic agents. Of those, 94.5% of paresthesia cases involved the mandibular nerve block, and 89% involved the lingual nerve. Articaine 4% was involved in 51.3% of the cases, prilocaine 4% in 42.9% of the cases, and lidocaine 2% in 4.9% of the cases.¹⁷

Other studies have demonstrated no additional risks with articaine as compared to other local anesthetics. Pogrel, studied a total of 57 patients who demonstrated nerve damage to the inferior alveolar or lingual nerve resulting from an inferior alveolar nerve block. Results predicted on the basis of their estimated use showed that paresthesia reports for 4% articaine were proportional to 4% prilocaine and 2% lidocaine.¹⁸ Because of the controversy and conflicting information surrounding this issue, it is clear that more scientific based evidence is needed. It is essential that the dental hygienist remain abreast of the current research of all anesthetics, and administer a drug only if the benefits for its use outweigh the risks.

Articaine 4% in a 1:200,000 epinephrine combination was approved for use in the United States in August 2006. Studies have demonstrated that, while the duration and pulpal effectiveness is comparable to the 1:100,000 concentration, this formulation provides an additional local anesthetic option for patients with significant cardiovascular disease and for patients taking medications that enhance the systemic effects of epinephrine.

Bupivacaine

Bupivacaine is the most potent and toxic of all amide anesthetics. It is four times more potent than lidocaine, mepivacaine, and prilocaine, and three times more potent than articaine. It is also four times more toxic than lidocaine, mepivacaine, and articaine, and six times more toxic than prilocaine.²

Bupivacaine is pharmacologically similar to mepivacaine, with the exception that the methyl group is exchanged for the butyl group. This substitution allows for a fourfold increase in potency and creates the increased toxicity. It also provides bupivacaine with the major advantage of an increased duration of action as compared to the other amides.^{4,6} Bupivacaine is the only anesthetic that provides a long duration of action despite its intense vasodilating properties which are second to procaine and significantly greater than lidocaine.

Bupivacaine is exclusively formulated in a 1:200,000 epinephrine combination due to its significant vasodilatory properties. Bupivacaine is highly lipid soluble and binds powerfully to the protein receptor sites in the sodium channels. It provides approximately 1.5 to 3 hours of pulpal anesthesia, and 4 to 9 hours of soft tissue

anesthesia. When the quantity administered exceeds the maximum recommended dose, bupivacaine has equal effects on the central nervous system and cardiovascular system. Bupivacaine's long half-life of 2.7 hours further increases the risk for systemic toxicity.²

The use of bupivacaine is indicated when pulpal anesthesia greater than 1.5 hours is needed, as in full mouth reconstruction or implant surgery. It is also a drug of choice when postoperative pain control is needed as in endodontic and oral and periodontal surgical procedures. In addition, bupivacaine can be a good alternative when profound anesthesia has been difficult to attain with other anesthetic formulations.² With the highest pKa, or dissociation constant, of the amide anesthetics, bupivacaine has a slightly slower onset of action, however the duration of anesthesia is almost twice that of lidocaine. Bupivacaine is not recommended for use on patients who are prone to cheek, lip or tongue biting, such as individuals with special needs and young children. It is metabolized by liver enzymes in the same manner as lidocaine and mepivacaine, so the same precautions for individuals with liver dysfunction apply when using bupivacaine.

The Role of Buffering and Local Anesthetics

Chemically, amide local anesthetics are weak bases. In the manufacturing process, amides combine with an acid to form a hydrochloride salt, rendering them water-soluble, creating a stable, injectable anesthetic solution. (Figure1) The pH, or

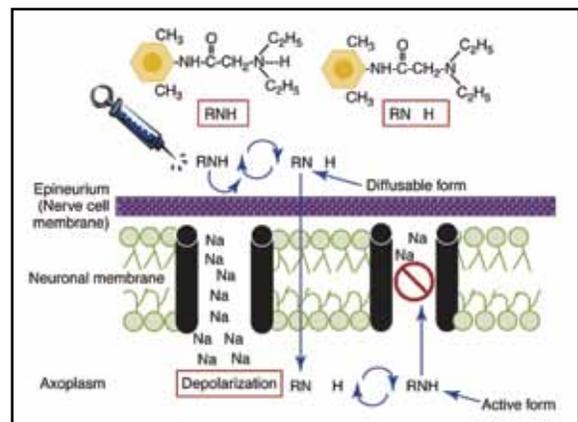


Figure 1: Local anesthetic action. The anesthetic exists in equilibrium as a quaternary salt (RNH⁺) and tertiary base (RN). The proportion of each is determined by the pKa of the anesthetic and the pH of the tissue. The lipid-soluble tertiary form (RN) is essential for penetration of both the epineurium and neuronal membrane. Once the molecules reaches the axoplasm of the neuron, the amine gains a hydrogen ion, and the ionized quaternary form (RNH⁺) is responsible for the actual blockade of the sodium channel.

From: Logothetis DD: Local Anesthesia for the Dental Hygienist, St Louis, 2012, Elsevier.

Continued on Page 10

acid-base balance, of the solution is manipulated by the manufacturer to complement the specific molecular structure of each anesthetic. However, it is important to note that all local anesthetic solutions are acidic prior to injection. Local anesthetic solutions formulated without vasoconstrictors range in pH from approximately 5 to more than 6. In general, preparations with vasoconstrictors requiring the preservative sodium bisulfite are even more acidic with a range from 3.8 to 5. The acidic nature of the local anesthetic creates clinical disadvantages for the patient including stinging or burning sensation on injection and post-injection tissue trauma. The reliability of local anesthetic action in the presence of infection and inflammation is also influenced by the acidic nature of the anesthetic.²

The pH of the solution affects the way anesthetic works. The unionized (base) form of the anesthetic is lipophilic and readily penetrates the nerve membrane to enter the nerve axon where the anesthetic attaches to the receptors on the sodium channels blocking the nerve conduction. After the anesthetic has been injected, the tissue's buffering capacity raises the pH and a percentage of the drug dissociates to become free bases. The quantity of free bases will depend on the dissociation constant, or pKa of the individual anesthetic. The free bases then penetrate the lipid cell membrane in order to reach the interior of the axon where a portion of the anesthetic re-ionizes. The re-ionized portion enters and plugs the sodium channels preventing depolarization of the sodium ions. As a result, the action potentials are neither generated nor propagated and a blockage of the nerve conduction occurs.²

Anesthetic buffering, well documented in medicine, is a new procedure in dentistry providing the practitioner a way to neutralize the anesthetic immediately prior to the injection. This process takes place *in vitro*, or outside the body, rather than the usual *in vivo* buffering process, which relies on the individual's own physiology to buffer the anesthetic. Some researchers suggest that adjusting the pH of the anesthetic towards physiologic, prior to injection, improves patient comfort in addition to reducing anesthetic latency and increasing anesthetic efficacy in areas of infection.¹⁹⁻²¹ For example, when a formulation of 2% lidocaine with epinephrine is buffered *in vitro*, the pH was raised from 3.5 to 7.4, and there was a 6,000 fold increase in the quantity of active, ionized anesthetic.² Other investigators have not been able to demonstrate any improvement in anesthetic efficacy with *in vitro* buffering.²³⁻²⁵

In vitro anesthetic buffering for dentistry can be accomplished through a new process from Onpharma®.¹⁹⁻²² The process utilizes a mixing pen and cartridge connectors, and provides an automated method of adjusting the anesthetic pH chairside, immediately prior to injection. (Figures 2)

The buffering process utilizes a sodium bicarbonate solution that is mixed together with the cartridge of local anesthetic such as lidocaine with epinephrine. The interaction between the sodium bicarbonate (NaHCO_3) and the hydrochloric acid (HCL) contained in the local anesthetic creates water (H_2O) and carbon dioxide (CO_2).²⁵ The CO_2 diffuses out of solution immediately and remains in the tissue after the solution has been injected.²⁶ Catchlove concluded that the CO_2 in combination with lidocaine potentiates the action of lidocaine via the direct depressant effects of CO_2 on the nerve axon. This action concentrates the local anesthetic inside the nerve trunk through an ion trapping process thus changing the charge of the local anesthetic inside the nerve axon.²⁶ As with any new product, more research is needed to evaluate the advantages, disadvantages and the overall consistency of results.

Reversing the Effects of Local Anesthetics

Phentolamine Mesylate

Phentolamine mesylate is an alpha-adrenergic receptor antagonist that is being used in dentistry to reverse the effects of local anesthetics that contain vasoconstrictors. Phentolamine mesylate competes for the receptor sites of the vasoconstrictor, thus encouraging faster metabolic reuptake of the local anesthetic by way of increased vasodilation.²⁷⁻²⁸ OraVerse®, introduced by Novalar in 2008, is currently the only local anesthesia reversal agent available. It is packaged in an anesthetic cartridge that features a translucent green label and blue aluminum cap to readily distinguish it from local anesthetic cartridges. (Figure 3)

This agent may be used when faster recovery time is beneficial. It is especially useful when treating pediatric and special needs populations in whom the risk of self-inflicted oral trauma is greatly increased due to lack of oral awareness, or when patients prefer not to feel post-treatment numbness for long durations of time. The manufacturer claims that, when used properly, OraVerse® will



Figure 2: The cartridge connector is used for the transfer of sterile solutions from one sealed container into a second sealed container. The connector provides a reservoir for collecting the excess solution displaced from the second sealed container during the transfer process.

Photo courtesy of Onpharma Inc., Los Gatos, CA



Figure 3: OraVerse agent used for local anesthetic reversal is easily distinguished from local anesthetic cartridges from its translucent green label and blue aluminum cap.

Photo courtesy of Novalar Pharmaceuticals

reduce the length of prolonged anesthesia by almost half the original duration of action when an anesthetic with the vasoconstrictor epinephrine is used.²⁸

The delivery method of phentolamine mesylate is similar to the delivery of the local anesthetic agent. OraVerse[®] is administered by submucosal injection at a 1:1, cartridge to cartridge ratio, of the previously administered local anesthetic containing a vasoconstrictor. The same techniques used for the local anesthetic injection should be used when administering OraVerse.²⁸ For example, if an inferior alveolar block was administered using 1 cartridge of local anesthetic with a vasoconstrictor, then a second inferior alveolar block should be administered following treatment using 1 cartridge of local anesthetic. Anesthetic reversal with OraVerse[®] is contraindicated in the following patient categories: patients younger than 6 years of age, patients weighing less than 15 kg or 33 lbs, patients who are sensitive to phentolamine mesylate, patients with history of myocardial infarction, patients with angina, and patients with coronary artery disease.

Conclusion

New local anesthetic agents continue to be introduced periodically for use in dentistry providing the dental hygienist with a number of options for administering comfortable pain control. While no one local anesthetic agent has been demonstrated to be superior over other agents, the dental hygienist must choose an anesthetic on a case by case basis by weighing the benefits and risks. New agents, including buffering agents and local anesthetic reversal, require more controlled dental clinical trials to demonstrate their effectiveness, consistency of results and clinical relevance in dentistry. Dental hygienists should remain current on all local anesthetic agents options available, and watch for future research to continue to clarify their benefits and limitations.

About the Author:

Demetra Daskalos Logothetis RDH, MS is Professor and Vice Chair of the University of New Mexico, Department of Dental Medicine, and the Director of the Division of Dental Hygiene. Demetra has been a Professor at the University of New Mexico for 25 years, and has been teaching local anesthesia for 15 years. She is the author of *Local Anesthesia for the Dental Hygienist*, a new textbook by Elsevier Publishing (copyright 2012), exclusively related to local anesthesia for the practice of dental hygiene.



References

1. Boynes SG, Zovko J, Bastin JZ, Bastin MR, Grillo MA, Shingledecker BD. Dental hygienists' evaluation of local anesthesia education and administration in the United States. *J Dent Hyg.* 2011; 85(1): 67-74.
2. Logothetis DD. Local anesthesia for the dental hygienist. St. Louis: Elsevier; 2012.
3. Gootenberg P. Cocaine: global histories. New York: Routledge, 1999.
4. Gallucci JM. Who deserves the credit for discovering ether's use as a surgical anesthetic? *J Hist Dent.* 2008 Spring;56(1):38-43.
5. Goldie MP. The evolution of analgesia and anesthesia in oral health care. *RDH.* 2009 Sep; 29(9):58-64.
6. Jastak T, Yagiela J, Donaldson D. Local anesthesia of the oral cavity. St Louis: Saunders; 1995.
7. Malamed S. Handbook of local anesthesia, 3rd ed. St Louis: Mosby; 2004.
8. Isen DA. Articaine: pharmacology and clinical use of a recently approved local anesthetic. *Dent Today.* 2000 Nov; 19:72-77.
9. Kaana, MD, Whitworth, JM, Corbett, IP, Meechan, JG. Articaine and lidocaine mandibular buccal infiltration anesthesia: a prospective randomized double-blind cross-over study. *J Endod.* 2006 Apr; 32(4):296-298.
10. Robertson D, Nussstein, J, Reader, A, Beck, M, McCartney, M. The anesthetic efficacy of articaine in buccal infiltration of mandibular posterior teeth. *J Am Dent Assoc.* 2007 Aug; 138(8):1104-12.
11. Haas DA, Lennon D. A 21 year retrospective study of reports of paresthesia following local anesthetic administration. *J Can Dent Assoc.* 1995; 61:319-330.
12. Dower JS. A review of paresthesia. *Dent Today* 2003; 22:64-69.
13. Garisto GA, Gaffen AS, Lawrence HP, Tenenbaum HC, Haas DA. Occurrence of paresthesia after dental local anesthetic administration in the United States. *J Am Dent Assoc.* 2010 Jul; 141(7):836-844.
14. Malamed SF. Local anesthetics: dentistry's most important drugs, clinical update 2006. *J Calif Dent Assoc.* 2006; 34(12): 971-976.
15. Malamed SF. Articaine versus lidocaine: the author responds (comment on Dower JS Jr. Articaine vs lidocaine. *J Calif Dent Assoc.* 2007 Apr;35(4):240, 242, 244). *J Calif Dent Assoc* 2007; 35(6):383-385.
16. Gaffen AS, Haas DA. Retrospective review of voluntary reports of nonsurgical paresthesia in dentistry. *J Can Dent Assoc.* 2009; 75(8):579.
17. Garisto GA, Gaffen AS, Lawrence HP, Tenenbaum HC, Haas DA. Occurrence of paresthesia after dental local anesthetic administration in the United States. *J Am Dent Assoc.* 2010; (141)7: 836-844.
18. Pogrel MA. Permanent nerve damage from inferior alveolar nerve blocks—an update to include articaine. *J Calif Dent Assoc.* 2007; (35)4: 271-3.
19. Bowles WH, Frysh H, Emmons R. Clinical evaluation of buffered local anesthetic. *General Dentistry.* 1995;43(2):182.
20. Stewart JH, Cole GW, Klein JA. Neutralized lidocaine with epinephrine for local anesthesia. *J Dermatol Surg Oncol.* 1989; 15(10):1081.
21. Malamed S. Buffering local anesthetics in dentistry. *The pulse.* 2011;44(1): 7-9.
22. Stewart JH, Cole GW, Klein JA. Neutralized lidocaine with epinephrine for local anesthesia. *J Dermatol Surg Oncol.* 1989; 15(10):1081.
23. Primosch RE, Robinson L. Pain elicited during intraoral infiltration with buffered lidocaine. *American Journal of Dentistry.* 1996; 9(1): 5.
24. Whitcomb M, Drum M, Reader A, Nussstein M, Beck M. A prospective, randomized, double-blind study of the anesthetic efficacy of sodium bicarbonate buffered 2% lidocaine with 1:100,000 epinephrine in inferior alveolar nerve blocks. *Anesthesia progress.* 2010; 57: 59.
25. Ackerman WE, Ware TR, Juneja M. The air-liquid interface and the pH and PCO₂ of alkalinized local anaesthetic solutions. *Canadian Journal of Anaesthesiology.* 1992;39(4): 387.
26. Catchlove, RFH. The influence of CO₂ and pH on local anesthetic action. *The Journal of Pharmacology and ExpTherap.* 1972; 181(2):298-309.
27. Phentolamine. (2009). *Merck manuals: online medical library.* Retrieved (September 5, 2010) from Phentolamine Drug Information Provided by Lexi-Comp Merck Manual Professional.mht
28. OraVerse (2009). *Highlights of prescribing information.* Retrieved (September 5, 2010) from <http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/PediatricAdvisoryCommittee/UCM214420.pdf>.

Home Study Correspondence Course

“Local Anesthetic Agents: – A Review of the Current Options for Dental Hygienists”

2 CE Units – Member \$25, Potential member \$35

Circle the correct answer for questions 1-10

- Which of the following is classified as an ester compound?
a. lidocaine c. prilocaine
b. novacaine d. mepivacaine
- One of the first chemicals developed by the Germans and used for local anesthesia was _____.
a. lidocaine
b. novacaine
c. cocaine
d. mepivacaine
- The most commonly used local anesthetic in the United States for dental use is _____.
a. lidocaine
b. articaine
c. prilocaine
d. mepivacaine
- Which is the local anesthetic of choice when a vasoconstrictor is contraindicated?
a. lidocaine
b. bupivacaine
c. prilocaine
d. mepivacaine
- Which of the following local anesthetics is metabolized primarily in the blood and is therefore considered a safer choice to re-administer during dental treatment.
a. bupivacaine
b. articaine
c. prilocaine
d. mepivacaine
- Which of the local anesthetics currently available is considered the least toxic?
a. bupivacaine c. prilocaine
b. lidocaine d. mepivacaine
- Which of the following local anesthetics is the most potent and toxic?
a. lidocaine
b. bupivacaine
c. prilocaine
d. mepivacaine
- Which is the vasodialator used with mepivacaine?
a. levonordefrin
b. novacaine
c. epinephrine
d. benodorfrine
- Which of the following local anesthetics is indicated when a long duration is required and when post operative pain control is desirable?
a. lidocaine
b. bupivacaine
c. prilocaine
d. mepivacaine
- The concept of pre-injection buffering to neutralize the local anesthetic prior to injection can have which of the following advantages?
a. improved efficacy in areas of infection
b. increased vasoconstriction
c. improved patient comfort
d. both a and c
e. all of the above

The following information is needed to process your CE certificate. Please allow 4 - 6 weeks to receive your certificate. Please print clearly:

ADHA Membership ID#: _____ Expiration: _____ I am not a member
Name: _____ License #: _____
Mailing Address: _____
Phone: _____ Email: _____ Fax: _____
Signature: _____

Please mail photocopy of completed Post-test and completed information with your check payable to CDHA:
130 N. Brand Blvd, Suite 301, Glendale, CA 91203

The Horizontal Incisive Block Underutilized but Ultimately Useful

Introduction

Are you utilizing all the local anesthetic blocks you learned from your dental hygiene coursework? When you have a maintenance patient with heavy supragingival deposits on the mandibular anteriors over sensitive newly exposed roots, how do you provide pain control? How do you go about making your patient comfortable without giving bilateral inferior alveolar (IA) blocks when you only have one “block” of time to complete the patient?¹

The answer for both questions could be the incisive block! It is simple, fast, and very useful. We all have light bulbs go on when we find ways to provide better patient care. In my case it was with the postal worker who had a history of calculus reformation on the



Figure 1 Heavy calculus formation on malpositioned mandibular anterior teeth

entire mandibular anterior sextant, as well as within the Stillman's clefts, and who still had moderate levels of dentinal hypersensitivity from the initial Non-surgical Periodontal Therapy (NSPT). Even with fair to good homecare and

regular maintenance appointments, the patient still found it hard to keep up with his calculus formation in this area.

In addition, the patient's non-compliance in wearing his retainer/nightguard post orthodontic therapy did not help matters. Mesial drifting had taken over the mandibular anterior sextant due to his nightly bruxing. As a clinician, you could consider using topical desensitizers and alternating unilateral IA blocks but instead, how about achieving pulpal, as well as facial gingival, anesthesia by utilizing a bilateral incisive block?

At the end of a very successful appointment using this expanded pain control protocol, my patient was beaming and ready to show off his smile at our local post office. So, the next time a similar case presents itself to you, expand your repertoire of injection techniques and try the horizontal incisive block.

Review of the Incisive Block

Preanesthetic Anatomy Review

The incisive nerve is an afferent nerve composed of dental branches from the mandibular premolar and anterior teeth. These nerve branches originate in the pulp, exit the teeth through the apical foramina, and join with the interdental branches from the surrounding periodontium, forming a dental plexus in the region.^{2,3} The incisive nerve then merges with the mental nerve, just posterior to the mental foramen.

The incisive nerve is anesthetized by the incisive block at the site of the mental foramen, or with either the Inferior Alveolar (IA) block or Gow-Gates block along with other branches of the mandibular nerve (or division).^{1,4} The incisive nerve goes on to form the inferior alveolar nerve in the mandibular canal before it exits the mandibular foramen. Crossover from the opposite incisive nerve can occur, which becomes an important consideration when administering local anesthesia for the mandibular premolars, anterior teeth and associated tissue.

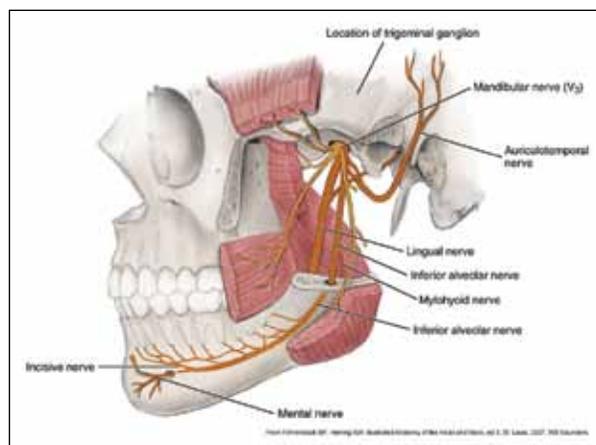


Figure 2: Distribution of the Mandibular Nerve

The target area for the incisive block is anterior to where the mental nerve enters the mental foramen to merge with the incisive nerve and form the IA nerve. The mental foramen is usually located on the surface of the mandible between the apices of the mandibu-

Continued on Page 14

lar first and second premolars, an “anatomically safe” region.”⁵ However, studies show that the mental foramen can be as far posterior as the mandibular first molar or as far anterior as the distal surface of the mandibular canine. Therefore, it is wise to start palpating for it at the first molar within the depth of the mucobuccal fold.

The mental foramen can also be located on a radiograph beforehand to allow for a better determination of its position during palpation. To locate the foramen, palpate intraorally with a cotton tip applicator the depth of the mucobuccal fold, between the apices of the mandibular premolars until a depression is felt on the surface of the mandible that is surrounded by smoother bone.



Figure 3: The mental foramen on the mandible



Figure 4: Locating the mental foramen

Pressure in this area may produce sensitivity as the mental nerve is compressed against the mandible. Care must be taken not to apply too much pressure to the site before administering the anesthetic agent.

Indications Review

The incisive block anesthetizes the pulp and periodontium of the mandibular teeth anterior to the mental

foramen, usually the mandibular premolars and anteriors, as well as the facial gingival tissue. One indication for the use of this block is for NSPT on the mandibular anterior sextant as in the private practice case previously presented.¹

The incisive block does not provide lingual soft tissue anesthesia of the anesthetized teeth. An additional supraperiosteal injection may be indicating if necessary for localized lingual soft tissue anesthesia and/or hemostatic control. A local anesthesia textbook can help the clinician with the protocol for this additional injection.¹ Bilateral IA blocks are usually not recommended due to patient discomfort from the deep numbness of the base of the tongue making the bilateral incisive block and lingual supraperiosteal injection is a ready replacement in many situations.

Patients with only the mandibular anterior sextant dentition present are ideal candidates, as well as initial NSPT cases divided into sextant appointments. Finally, in cases where there is incisive nerve crossover, causing the mandibular anteriors to fail to achieve complete anesthesia, a contralateral incisive block may be the perfect solution.

In his recent lectures, Dr. Stanley Malamed, professor of Medicine and Anesthesia at the University of Southern California School of Dentistry, has advised dental professionals to use the incisive block so as to take advantage of the “hole in the bone - the mental foramen”. He feels this block provides a “99.9% guarantee of anesthesia to the mandibular anterior and premolar teeth”.⁵

Procedural Review

The older injection protocol recommends that the clinician sit behind the patient and use a vertical approach with the syringe into the target tissue. Visibility was poor for the clinician to see the target tissue as well as the large window on the syringe to check for negative aspiration. More importantly, the patient was often alarmed at seeing the syringe with needle coming down between their eyes.

With the newly recommended horizontal approach, the clinician sits more along the side of the patient, providing better visibility and obstructing the patient’s line of sight of the advancing syringe and needle.¹ In this position, the needle tip with its bevel toward the bone can gently slide past the periosteum and there is no possibility of injury by scraping the periosteum or going through the lower lip. The injection is “relatively painless, and the landmarks are reliable and consistent”.⁵



Figures 5 and 6: Operator and patient positioning for the horizontal right and then left side incisive block injections

Technique Basic Steps

1. With the patient in a supine or semisupine position, sit at 8 o'clock (right side) or 9 o'clock (left side) for the right-handed clinician. For the left-handed clinician, sit at 4 o'clock (right side) or 3 o'clock (left side) (see figures 4 and 5).

2. Complete the basic preanesthetic procedures for the area to be anesthetized in order to reduce the level on the visual analog scale (VAS) noted by the patient. This will ensure the achievement of a "Velvet Touch"* injection. ^{6, 7, 8, 9}

3. Request that the patient partially close to allow greater access to the injection site.

4. Retract the patient's lower lip outward, using gauze, to pull the tissue taut.

The injection site is anterior to the depression created by the mental foramen in the depth of the mucobuccal fold found earlier by palpation. ¹⁰

5. Using a 27-gauge short needle, direct the syringe barrel from the anterior portion of the mouth to the posterior in a horizontal manner, while resting on the lower lip. This will keep the needle syringe out of the patient's view.

While positioning the syringe, make sure to orient the bevel of the needle towards the bone and large window towards the clinician's line of vision. ¹

6. The needle is advanced without contacting the bony surface of the mandible, with the depth of penetration at 5 to 6 mm. The injection is slowly administered after negative aspiration within two planes.

7. Use between 0.6 to 0.9 mL or one third to one half of the cartridge administered over 30-60 seconds. Calculations will vary depending on the specific anesthetic used.

* "Velvet touch" is a concept created by the author that places emphasis on how the injection is given.

8. Apply gentle pressure to the site intra- and extra-orally following the injection by way of a soothing massage for at least

two minutes. This will help force more local anesthetic agent into the mental foramen, thus anesthetizing the shallow mental nerve and the deeper incisive nerve.

Additional Considerations

If the tissue balloons, the anesthetic is being injected too rapidly. Stop the deposition and remove the needle. ^{6,11}

A vasoconstrictor-laced agent is highly recommended for providing hemostatic control before NSPT due to the usually inflamed and vascular gingival tissue presented. ¹²

It is not necessary to have the needle enter the mental foramen to achieve a successful injection; in fact, the needle cannot enter the mandibular canal using the recommended position of the needle. ^{13,14}

Dr. Malamed suggests that dental professionals consider this a type of "infiltration"

with the addition of pressure to the mental foramen, similar to the way the infraorbital block is administered to the infraorbital foramen. ⁵ Placing the patient in an upright or semiupright position while massaging the anesthetic agent has been shown to promote further diffusion of the solution into the region via gravity. ^{1,3} Anesthesia of the tissue innervated by the mental nerve will precede that of the deeper incisive nerve's tissue; thus the soft tissue anesthesia precedes pulpal anesthesia. The careful clinician waits at least 3-5 minutes for complete pulpal anesthesia before beginning instrumentation.

Summary

So, when considering your next periodontal maintenance case or mandibular anterior sextant patient, or failure when faced with the failure of the IA block to fully anesthetize the mandibular anteriors, try utilizing the incisive block. You may also want to update your technique to include the newer horizontal approach. You and your patient will be pleased with the results!



Figure 7: Syringe position for the incisive block



Figure 8: Massage the injection site for at least two minutes with the patient in a semi-upright or upright position.

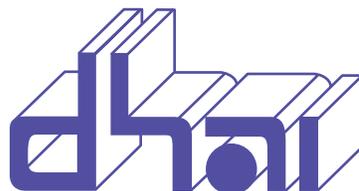
About the Author

Margaret J. Fehrenbach, RDH, MS is a dental science writer and dental hygiene educational consultant residing in Seattle, WA. The material in this article has been presented with permission from her private collection and also from her upcoming 4th edition of *Illustrated Anatomy of the Head and Neck* and 3rd edition of *Illustrated Dental Embryology, Histology, and Anatomy* (WB Saunders/Elsevier). Margaret has recently contributed to the general anatomy and technique chapters in the newly published text, *Local Anesthesia for the Dental Hygienist* (Logothetis, DD, WB Saunders/Elsevier, 2012). For more information on Margaret's activities and publications, please visit her website at <http://www.dhed.net>



References

1. Fehrenbach, MJ and Logothetis, DD. Mandibular nerve anesthesia, *Local Anesthesia for Dental Hygienists*, Logothetis, DD. WB Saunders/Elsevier, St. Louis, 2012: 272-273, 293-295.
2. Fehrenbach, MJ. Anatomic considerations for the administration of local anesthesia, *Local Anesthesia for Dental Hygienists*, Logothetis, DD. WB Saunders/Elsevier, St. Louis, 2012: 190, 193-194.
3. Fehrenbach, MJ and Herring, SW. *Illustrated Head and Neck Anatomy*, 3 ed, WB Saunders/Elsevier, St. Louis, 2007: 204, 241-243 (4 ed, 2012, in press).
4. Fehrenbach, MJ. Gow-Gates mandibular nerve block: an alternative in local anesthetic use: *Access (ADHA)*. November 2002: 34-37; accessed on June 27, 2011 at http://www.dhed.net/Gow_Gates_Nerve_Block.pdf
5. Malamed, SF. *The Renaissance in Local Anesthesia*, International Dental Seminars, San Marino, CA, as attended in Seattle, WA, November 13, 2010.
6. Fehrenbach MJ and Weiner J. *Saunders Review of Dental Hygiene*, 2 ed, WB Saunders/Elsevier, St. Louis, 2009: 470-501.
7. Fehrenbach, MJ. Pain control for dental hygienists: current concepts in local anesthesia are reviewed, *RDH Mag*, February 2005; accessed on June 27, 2011 at <http://www.rdhmag.com/index/display/article-display/222356/articles/rdh/volume-25/issue-2/feature/pain-control-in-dental-hygiene.html>
8. Fehrenbach, MJ and Logothetis, DD. Maxillary nerve anesthesia, *Local Anesthesia for Dental Hygienists*, Logothetis, DD. WB Saunders/Elsevier, St. Louis, 2012: 225; access sample chapter at http://staging.coursewareobjects.com/objects/evolve/E2/book_pages/email/11_NHPjgi_1099_logothetis-SampleChapterEmail_PODapr2011/Logothetis_Chapter_12main.pdf.
9. Doniger, SB. Delivering local anesthesia, *RDH Mag*, April 2005; accessed on April 7, 2011 at <http://www.dentistryiq.com/index/display/article-display/227862/articles/rdh/volume-25/issue-4/feature/delivering-local-anesthetic.html>
10. Bath-Balogh M and Fehrenbach MJ. *Illustrated Dental Embryology, Histology, and Anatomy*, 3 ed, WB Saunders/Elsevier, St. Louis, 2011: 114.
11. Whitworth JM, et al. Influence of injection speed on the effectiveness of incisive/mental nerve block: a randomized, controlled, double-blind study in adult volunteers. *J Endod*. 2007 Oct;33(10):1149-54. Epub 2007 Aug 23; accessed on June 27, 2011 at <http://emedicine.medscape.com/article/82603-overview>
12. Fehrenbach, MJ. A lesion in ease..., *Mod Hyg*, July 2007: 1-3; accessed June 27, 2011 at http://www.dhed.net/A_Lesson_In_Ease-Case_Study.pdf
13. Joyce AP, Donnelly JC. Evaluation of the effectiveness and comfort of incisive nerve anesthesia given inside or outside the mental foramen. *J Endod*. 1993 Aug;19(8): 409-11.
14. Forbes, WC. How to treat a difficult-to-anesthetize patient, twelve alternatives to the traditional inferior alveolar nerve block (Author's Note: see #9), *Today's FDA*, May/June 2010: 22:3; accessed on May 15, 2011 at http://floridadental.org/pro/members/publications/todaysfda/2010_0506/10.html



**Dental Hygiene
Associates Inc.
(DHAI)**
is the California
Dental Hygienists'
Association (CDHA)

charitable 501(c)(3) foundation, created
to support the association scholarships
and research grants.

Advance DHAI's mission of improving
oral health through education, research
and community service by
making a donation today!

Make check payable to DHAI, and mail to:

130 N. Brand Blvd., Suite 301
Glendale, CA 91203

Donations are 100% tax deductible.

Any questions, please call CDHA's Central Office at
818-500-8217

Dental Hygiene Students Scale Disneyland

Let's hear it for dental hygiene students! This year, 24 schools (147 students) attended the 2011 CDHA Student House of Representatives (SHOR) and voiced their valued opinions at the CDHA House of Delegates (HOD), June 3rd through June 5th at the Disneyland Hotel in Anaheim, CA. The students were far from idle during these three short days,



CDHA Student Delegates 2011

starting off by electing their own Speaker of the House, Amanda De La Vega (West Los Angeles College), and two Voting Student Delegates, Amira Elkerdany (Chabot College) and Morgan Kozek (University of Southern California). Student House of Representative (SHOR) topics discussed included establishing a definition for "health literacy" and its importance as a goal for all dental hygienists, as well as the exciting redesign of the CDHA web site. The students of this year's SHOR also showed pro-active initiative in bringing up a hot-topic issue to the HOD floor, proposing new HOD business with a resolution to conduct a dental hygiene program needs assessment to determine the need for future programs. Overwhelming support was shown for the students' concern regarding the continued propagation of new programs while the employment market and the economy continues to lag. Although the new business was not heard by the HOD, it was clear that the students effectively planted a seed for much needed debate on the subject for next year's 2012 HOD.

As a first time participant in SHOR, I was impressed by the relationship displayed between the student and professional members present. I was excited by my experience as a change agent when I, along with my fellow Voting Student Delegate, Morgan Kozek, had the privilege to vote on behalf of the students as one of the Voting Student Delegates at the HOD. This experience solidified my belief in committed membership with my professional association. Without the support of students and professionals alike, the association cannot rally for change on our behalf. Our voices are important to our professional association because it provides an avenue to express the current concerns and aspirations of the student voice, which in turn helps guide the profession to meet the needs of the future generation of dental hygienists. Additionally,

my involvement with CDHA allowed me to feel part of a professional community, thereby strengthening my identity as a future hygienist. In terms of networking, not enough can be said for its importance in today's employment market. Actively participating in our professional association allows students to receive expert advice and provides the opportunity to build lasting relationships with many of CDHA's experienced members.

After attending the CDHA HOD, I can proudly say that the "fresh voices" of dental hygiene are far from apathetic. Passion for dental hygiene was evident among the students, especially in regards to the safety and future of the profession, as witnessed by the heated discussion on the proliferation of new dental hygiene programs in the SHOR session and in Saturday morning's mega issue discussion on mid-level providers.

I am honored that I was able to bare witness to such intelligent and devoted students, and I am proud to call them my colleagues. Finally, despite all the hard work that went into making the HOD a success, I would like to testify that dental hygienists still know how to have fun! Complete with Disney costumes, and a live D.J., hygienists and students alike impressed me at the President's Reception as they danced the night away and still managed to raised over \$5000 for CAL HYPAC with the annual silent auction!



Amira Elkerdany is a dental hygiene student at Chabot College. She currently holds a BA degree in Peace and Conflict Studies, with a concentration in human rights, from the University of California, Berkeley. Her interest in political activism and desire to represent the student voice in policy decisions led her to run for Voting Student Delegate, along with the help

and guidance of JoAnn Galliano, Dental Hygiene Program Director at Chabot College, and Julie Coan, faculty member at Chabot College and CDHA Student Relations Council Co-Chair.

Continued on Page 18

California Students Excel in Table Clinic Competitions at CDHA!

Dental hygiene students from programs throughout the state gathered in Anaheim in May for the annual CDHATable Clinic competition. Student clinician- researchers presented on topics ranging from glove permeability factors to oral considerations during pregnancy. CDHA member judges had a difficult time selecting the winning presentations in the table clinic and research categories. By virtue of their hard work and valuable contributions to the professional exchange of research and information, all of the student participants were truly “winners” in the competition.

Informational Table Clinics

1st Place – Behind the Nano Silver Lining

Cypress Community College

Brianna Little

Tara McConnell

Lisa Ketelsleger

Rochell Currier



2nd Place – Super Model Approach for Reducing Periodontal Disease

West Los Angeles College

Eman Sartawi

Candace Reschke

Kathy Kawashima

Amanda Nickelson

3rd Place – Human Papilloma Virus and Oral Cancer

Moreno Valley College

Lilliam Leonro

Kristina Tyrrell

Research Table Clinics

1st Place – The Big Cover Up

Cerritos College –

Jaclyn Counterman

Joni Fisher



2nd Place – Got CAMBRA

West Coast University –

Michele Daru

3rd Place – Musculoskeletal Pain among Dental Hygiene Students

West Coast University

Brittany Mayer

Rita Kadehjam

Kristen Goeson

Tara Blake

Thank you to



for sponsoring this year's table clinic competition.

StudentConnection

Juliet Ebrahimian chosen to represent District XI Students



Students from California and Arizona were well represented by District XI student delegate, Juliet Ebrahimian, from the University of Southern California. Juliet, along with alternate student delegate Maryn Hardisen from Phoenix College in Arizona, attended the 88th Annual Session of the American Dental Hygienists' Association in Nashville, Tennessee in June. As part of the selection process for the student delegate position, Juliet wrote an essay on

the importance of student involvement in our professional association. She said, "The students of today are the professionals of tomorrow. They influence and shape the dental hygiene profession, working to create, maintain and improve the future of their profession. I believe that in order for students to learn and become the best possible professionals in this field, they need to be aware of the changes and the challenges that will influence their careers." In addition Juliet stated that student input also helps the profession to evolve and adapt in response to change over time.

"The younger generations of members provide fresh, distinctive and crucial ideas to an association that is looking to better itself."

"Without a doubt, there is a dual benefit." Juliet and Maryn will share their experiences as student delegates and the role of mentoring in the development of a professional in the fall issue of the CDHA Journal.



2011 CDHA SHOR Elected Student Representatives, from left to right: Morgan Kozek, USC; Amira Elkerdany Chabot College, Voting Student Delegates and Amanda De La Vega, West LA City College, Speaker of the Student House

Many thanks to Philips and Discus Dental for sponsoring the 2011 CDHA SHOR



California Students Receive National Recognition at ADHA

Only a month after the CDHA Spring Scientific Session and Table Clinic Competition, California students went on the road to Nashville Tennessee, for the Center for Lifelong Learning at the 88th annual session of the American Dental Hygienists' Association. Once again, California students shone with their presentations, with Jaclyn Counterman and Joni Fisher from Cerritos College again placing first in the research poster category with their study on the variation in permeability of laytex, vinyl and nitrile gloves. Congratulations are in order for all of the students and their faculty advisors who supported them throughout the process!

**1st Place Research –
The Big Cover Up
Cerritos College –
Jaclyn Counterman, Joni Fisher**

**2nd Place Table Clinic –
Xylitol Syrup Never Tasted so Sweet
University of Southern California –
Robin Nanda, David Tran, Cristy Bentley**

**Table Clinic Honorable Mention
Connecting the Dots: TMD and Body Posture
Cerritos College –
Katherine Carter, Jennifer Edington**

Learning to Work Pain Free – The Alexander Technique

As my dental hygienist bends over me and prepares to clean my teeth, I look up at her and relax in my chair. I can feel the soft cushioned pillow that she has placed behind my neck to ensure my comfort. As my thoughts turn to my caregiver, I wonder about her comfort. I watch as she leans over my body and stretches to turn on the water for me to rinse my mouth, and then bends back around to look at my x-rays. After reaching up to adjust the angle of the light, she makes minute repetitive movements to scale my



Compromising Posture

teeth with careful precision. At the end of my appointment, I notice that as she stands up to say good bye, her hands go to her lower back, pressing inward as she arches to stretch.

Have you wondered how it would feel to have energy rather than low back pain at the end of a work day? As a teacher of the Alexander Technique, I know that dental hygienists can learn how to work pain free.

The Alexander Technique is widely recognized in medical communities in the United States and abroad for its positive effects on pain relief. The Technique focuses on changing the postural habits that are often at the root of many physical aches and pains.

While many students of the Alexander Technique take lessons for pain relief, others take lessons to enhance their physical performance abilities. Athletes, singers, dancers and musicians use the Technique to improve their breathing, vocal production as well as their speed and accuracy of movement. Students of the Technique learn how to achieve a greater consciousness in controlling their bodies. Considering that most individuals have habitual patterns of tension that have been consciously or unconsciously

learned, developing an awareness of these patterns and “unlearning” them, enables students to redirect themselves into an optimal state of well being and function. Lessons in the technique reawaken an internal kinesthetic sense that, out of habit, has become out of balance. It is as if we are unconsciously directing our movements by a compass that is no longer pointing north, we are not able to sense that we are out of balance. Students of the Technique learn to adjust their inner compass so that their internal sense of space, or proprioception, functions better.

Current research demonstrates the positive effects of the Alexander Technique for patients with chronic pain issues as well as for a variety of professionals, including healthcare providers. In a recent study on low back pain published in the British Medical Journal, participants in the study group receiving 24 lessons in the Alexander Technique reported only three days of pain per month as compared to the subjects in the massage group with fourteen days of pain. A third group received only 6 lessons in the Technique and reported eleven days of pain per month.¹ Research conducted by physicians at Cincinnati Children’s Hospital Medical Center indicates that the Alexander Technique

What is the Alexander Technique?

A proven approach to self care, the Alexander Technique is a hands-on method for teaching individuals how to unlearn habitual patterns causing tension and pain in daily activities.

Effective for:

- neck and low back pain
- carpal tunnel/ repetitive stress injuries
- shoulder pain
- chronic pain and stress

How is the Alexander Technique taught?

Alexander Technique is generally taught in one-on-one lessons. Each lesson is approximately 45 minutes. During a lesson, a certified teacher uses both words and gentle, hands-on guidance to provide improved coordination. Students are fully clothed, and are either sitting, standing, or lying on a table.

How many lessons do I need before I see a change?

The number of lessons will depend on your individual physical condition, interests and goals. You will be able to apply new insights starting with the first lesson. After 6 to 10 lessons you should notice that the Alexander Technique is carrying over into your daily activities. The duration of study, or number of lessons, is based on the individual. Rather than a temporary solution with short-term results, lessons bring about gradual change and long-lasting results.

can enhance the posture and proficiency of surgeons who perform minimally invasive procedures, thereby reducing surgical fatigue and potential errors.² The goal of the study was to test the hypothesis that the Technique significantly enhances surgical ergonomics and proficiency with the ultimate goal of incorporating it into graduate surgical training. Minimally invasive surgical techniques often require that operators maintain awkward, non-neutral, static postures leading to high muscular loading and an increased risk for operator fatigue and injury. The pediatric urology residents and fellows who participated in the study reported improved posture and endurance following training in the Alexander Technique. Pramod P. Reddy, M.D, lead investigator of the study, reported that larger trials, including a variety of surgical specialties, will be conducted to further test the hypothesis at the University of Cincinnati.²



The Alexander Technique has the power to provide individuals with a renewed sense of vitality. Students learn to make regular pauses in their daily routines as a means of avoiding the tension that accumulates with any repetitive action. A good analogy is when you ride on a roller coaster. Learning to pause and readjust is a way to stop the roller coaster, take a breath, look around, and then let go. You can get back on the ride but the tension is gone. The Alexander

How did the Alexander Technique get started?

A Shakespearean actor, F.M. Alexander was born in Australia in 1869. As his acting career was getting started Alexander developed chronic hoarseness while performing. When leading physicians were not able to find a cause of his laryngitis, he thought that the cause might be related to how he was using his voice and he worked on developing a solution. Using a system of mirrors allowing him to study his posture and muscle movements, he found that upright posture, proper breathing and smooth, fluid muscle movements improved his condition. Learning to speak without habitual patterns of tension, he no longer experienced vocal problems. He regained a full, rich voice and was able to return to the stage. He found that his posture and overall coordination had improved and he no longer had the breathing problems he had experienced since childhood.

As Alexander further studied the relationships between habit, thought and perception, he was

able to teach his discoveries to other actors with such success that physicians began referring patients with various breathing and coordination problems to him. When the news of his successes spread, people came from around the world to study his techniques.

Formal training programs developed out the growing interest in Alexander's techniques. Today, over 100 years later, there are thousands of certified Alexander teachers worldwide.

AmSAT is the largest professional organization of teachers of the Alexander Technique in the United States. AmSAT-certified teachers have completed a comprehensive training over a minimum of three years at an approved teacher-training course. For a local teacher, or more information on the Alexander Technique go to www.amsatonline.org



Technique is a holistic way to address muscle pain and improve overall performance. It is an individualized skill that increases your body awareness and ultimately empowers you throughout your workday and beyond.

About the Author

Dana Ben-Yehuda is an AmSAT Certified teacher, in her 10th year of private practice in Mountain View, California. For more information about her practice and the Alexander Technique visit www.alexandertechnicestudio.org



References

1. Hollinghurst S, et al. Randomised controlled trial of Alexander technique lessons, exercise and massage (ATEAM) for chronic and recurrent back pain: economic evaluation. *BMJ*. 2008; Dec11;337:a2656.
2. Reddy P et al. The impact of the Alexander Technique in improving posture during minimally invasive surgery. Poster presented at the American Academy of Pediatrics Annual Meeting, San Francisco, October 2, 2010.

Leadership in Higher Education

The Evolving Career of a Dental Hygienist



Introduction

The career of a dental hygienist over a lifetime can often be considered diverse, yet few careers have been as rich and extensive as that of Mary Turner, RDH, EdD.

Mary Turner is the perfect example of an individual who has not only contributed to all the roles of a dental hygienist: administrator/manager, change agent, clinician, consumer advocate, educator/

health promoter, and researcher, she has also excelled as a professional. Honored for her contributions to organized dental hygiene, Mary was the recipient of the ADHA Distinguished Service Award in 1998. In 2007, she was again honored with the ADHA Award of Excellence in Dental Hygiene, acknowledging Mary for her many “outstanding accomplishments that impact the practice and future of the dental hygiene profession.”

Mary’s clinical career has included working as a dental assistant and later as a dental hygienist in general and periodontal practices in Iowa, Missouri, and California. She has managed all aspects of a specialty periodontal practice including personnel, billing, inventory, scheduling, and correspondence. Early in Mary’s teaching career, she taught dental and dental hygiene students and periodontal residents at University of Missouri-Kansas City (UMKC), utilizing a team approach to oral care. In 1984, Mary relocated to California and began teaching at Sacramento City College. Mary was a didactic and clinical professor in the Dental Hygiene and Dental Assisting Programs at Sacramento City College for 15 years. Former students continue to reminisce of Mary’s distinctive and singular style in the courses she taught with respect and dedication.

In 1999, Mary’s career as a dental hygiene educator changed dramatically when she was appointed Dean of Allied Health at Sacramento City College. In her new position, she was responsible for oversight of the college’s allied health programs, including registered nursing, vocational nursing, physical therapist assistant, occupational therapy assistant, dental assisting, dental hygiene and dental continu-

ing education. She was the first “non-nurse” to provide leadership for the allied health programs. During restructuring of departments in the college, Mary served briefly as interim Dean for the Science, Mathematics & Engineering Division. In 2002, she became responsible for the newly organized Science & Allied Health Division, which included the health programs as well as astronomy, biology, chemistry, geology, and physics. As Dean, her management responsibilities included 58 full-time faculty, 30 adjunct faculty, 12 staff members, and instruction for over 5,500 students.

In January 2010, after almost 11 years as a division Dean, Mary was appointed to her current position as Vice President of Instruction and Chief Instructional Officer for Sacramento City College. She is now responsible for approximately 325 full-time and 500 adjunct faculty, 13 instructional administrators and a student enrollment of approximately 28,000.

Mary Turner spoke recently with the *CDHA Journal* about the evolution of her career from her start in dental assisting to completing her doctorate in 2008 and her appointment as Vice President of Instruction.

How did you become interested in education?

At the time I graduated from high school, counselors guided most female students to secretarial school, teaching, and nursing. My parents thought I was headed off to a small business school when I changed my mind and decided to go to college to major in elementary education. It must have been the influence of either Mrs. Taylor, my kindergarten teacher who used to rap us on the head with her fingernails when she wanted our attention – something I vowed I would never do – or Mrs. Kramerer, my third grade teacher who I thought walked on water. Obviously, I never finished that elementary education degree but I never lost the desire to be a teacher.

I enrolled in the degree completion program at the University of Missouri, Kansas City (UMKC) after two years of working full-time in general and periodontal practices. Because of my earlier college, I was able to complete the bachelor degree coursework quickly and move immediately into the masters program, which focused on dental hygiene education. I had great mentors for shaping my educational philosophy and association involvement including Sarah Turner, Melanie Hamer and the faculty from Hawkeye Community College,

as well as Maxine “Pidge” Tishk, Adele Eberhart, and Pam Overman from UMKC.

How has your experience as a dental hygiene educator helped you in your role as Dean and now as VP of Instruction?

UMKC’s masters program provided an excellent foundation in education theory, instructional methodology, and assessment of student learning. Many of the faculty members I have hired have not had any educational theory in their masters or doctoral programs so I have been able to offer them guidance and resources on how to be successful in the classroom. As an administrator, I understand the faculty perspective, which is invaluable.

You recently finished your doctorate in 2008. Would you share with us the focus of your dissertation?

My dissertation was a case study focused on the assessment of organization culture in a community college partnership. A partnership had been established between the Sacramento City College nursing program and a local hospital system based on a shared goal of addressing the nursing shortage. As we developed the partnership, we didn’t really address the organizational differences between the two institutions especially the differences in their cultures – “the way we do things” – and that presented some interesting challenges. Since “culture clash” is one of the primary causal factors in the failure of corporate mergers and acquisitions, I wanted to study the characteristics of the two organizations to determine if some of the challenges we were facing were due to cultural differences. My survey results revealed that the cultural characteristics of the two organizations were indeed different. More importantly, the characteristics of the organizational culture as viewed by individuals within each organization were much different than the characteristics as perceived by members from the partnership. These perceived cultural differences resulted in conflicts in areas of trust, decision-making, communication, and leadership. The results suggested that organizations should practice cultural “due diligence” when entering into major partnership or collaborative efforts with outside organizations and establish appropriate methods to address conflicts that may arise due to those differences.

What are some of the biggest challenges in education, particularly in our community colleges?

Today, the biggest challenge in community college education is undoubtedly funding. This is true both in California and across the country. I am extremely fortunate to work in a fiscally sound district but even with our good financial planning we have reduced our

summer course schedule by 25% and our fall schedule another 7% on top of reductions made last academic year. The budget crisis has caused the state to re-evaluate and narrow the mission of community colleges. Institutions are forced to closely evaluate program and course offerings to ensure they address transfer, career technical education and basic skills. Our college remains committed to providing education for allied health professionals. However, this has resulted in additional reductions in general education offerings.

Another major issue for education is accountability for student outcomes, including learning outcomes, job skills and transfer readiness. Our allied health programs have always been more focused on outcomes due to programmatic accreditation requirements so the faculty within those programs have not struggled with this as much as those within some of our general education areas. However, due to changing student demographics and life issues, we are always looking for new ways to assist our students with program completion through services such as dedicated counseling, tutoring, and emergency financial support.

What do you miss most about working as a dental hygiene educator?

I miss working with students and seeing what educators’ refer to as the “light bulb coming on” when the student finally grasps a concept. My student interactions now are generally limited to congratulating them at graduation celebrations or trying to resolve a problem about a schedule, an instructor, or a grade.

It continues to amaze me that many of today’s students do not hesitate to elevate their personal issues directly to our college president or our district’s chancellor.

I also miss the hands on experiences with patients and I find myself sometimes daydreaming about tooth anatomy and measuring things in millimeters. And, I must confess that I have to work hard to keep from telling my hygienist to change her chair position or fulcrum when I am having my teeth cleaned!

You were very involved in leadership positions in CDHA and ADHA. Have you been able to apply any of the leadership skills you learned through your work in the association to your current position at Sacramento City College?

The leadership skills developed during my involvement in CDHA and ADHA were absolutely transferrable to my administration positions.

Strategic planning is critical to any organization so understanding the value a well-developed strategic plan as well as how to develop

Continued on Page 24

and evaluate the effectiveness of a strategic plan has certainly been a transferable skill. Resource management goes hand and hand with strategic planning. Although the budget I oversee at the VP level is much larger, I actually do not have as much to do with the day-to-day budget operations now as I did when I was a division Dean. There I handled a multi-million dollar budget that included thousands of dollars of grant money that comes with very specific accountability and reporting measures. Those years of going through approval of CDHA and ADHA budgets line by line was invaluable.

The other transferable skills are those a volunteer leader develops in the areas of inter personal communication, problem solving, and conflict resolution. Probably 95% of an administrative job is dealing with people and their personalities, whether it be faculty, students, staff, other administrators or the public.

I also benefitted from my experience testifying in legislative hearings and the public relations spokesperson training I received as an ADHA trustee. Our public information officer was quite impressed with my ability to deal with reporters during an emergency drill on our campus.

Do you have any advice for others who are interested in pursuing a career in higher education?

It is important for individuals to develop a personal philosophy that they can use to guide them in the educational setting. I know I always tried to focus on the students and to be fair when dealing with students, even if that meant giving them news they didn't want to hear. A full-time position in dental hygiene education may be very difficult to obtain in today's financial climate. If there is an opportunity, individuals should consider offering to volunteer in clinic or perhaps give a guest lecture for students. I first started teaching in our continuing education program and then served as a substitute clinical instructor before obtaining a full-time position. In addition, there are many free internet resources available from companies that provide good content on teaching theory and instructional methodology. Having some sort of educational background is always an additional selling point when applying for a teaching position.

What thoughts would you offer a fellow dental hygienist, considering the paths you have taken in your career and knowing what you know now?

It's never too late to "launch a dream" – whether it be personal or professional. It is also very important to have mentors in your life. Mentors do not always have to demonstrate the positive – they can

also influence you if they show you how **NOT** to do something. In fact, those individuals can in some ways be the most influential. Realize that your dental hygiene degree opens many doors and provides you with life-long career opportunities and the chance to connect with dental hygiene colleagues who will enrich your life in so many ways.

As a nominee for the ADHA Award for Dental Hygiene Excellence, Mary Turner's colleagues said:

- Mary is a **dedicated educator**, not just with students, but with the public as well. She is not afraid to ask the tough questions when issues concerning the dental hygiene profession arise. She is always willing to respond to questions in a manner that promotes a person's self-confidence.
- Mary's **leadership** skills include utilizing progressive critical thinking skills coupled with the voice of conscience. She has an amazing ability to be profoundly poignant while maintaining political diplomacy even during the most challenging situations.
- **"Consummate professional"** and **"role model"** are the words that come to mind when I think of Mary Turner. She is an example of what every hygienist who has a vision and works hard can accomplish. She is a role model of grace, dignity, poise, and calm intelligence.
- Mary is a dedicated **teacher, mentor** and **friend** to all who know her. All hygienists are lucky to call her a colleague.

About the Author

Carol Lee, RDH, BS is an adjunct faculty member at Sacramento City College and a clinician in private practice. Carol is also a frequently requested speaker for continuing education courses especially in the area of ergonomics and clinical practice. She is a past president of CDHA, a member of the Information Technologies Council and serves on the CDHA Journal Editorial Advisory Board.



Local Anesthesia: An Overview of Strategies for Maximizing Student Competence

As we learn more about the limitations of performing periodontal debridement procedures in the absence of endoscopy, we are reminded of the need to consider every approach available in order to achieve thorough debridement. This often includes the administration of local anesthesia to facilitate “definitive” and comfortable patient care. As educators we must ask ourselves: How well do we prepare our students to be confident and competent in providing this important service to patients? Do our students include the provision of local anesthesia in their dental hygiene treatment planning and patient care after graduation? In 2008 I conducted a survey of US dental hygiene programs which provided insight regarding curriculum organization and teaching methodologies for local anesthesia. Not surprisingly, the results suggested that student competence is directly proportional to: foundation instruction, practical experience, and instructor confidence and understanding.

Stand-Alone Introductory Local Anesthesia Course

Inclusion of an introductory course which includes didactic, laboratory, and preclinic components has been very popular in the western United States for some time. Programs in states with new laws allowing the use of local anesthesia often begin by introducing the content during senior clinics. Subsequently many have reported that changes, based upon outcomes assessment, include the provision of instruction earlier in the curriculum. Local anesthetic introductory course placement is important: too early, students may have too much time before they can implement the procedures with patients, and if too late, students may not have adequate number of experiences. Most programs provide the course in the 2nd semester of the “junior” year or the summer between “junior” and “senior” years.

Adequate laboratory and clinical experiences

Laboratory experiences should include simulation exercises where students identify penetration sites, practice fulcrums and use sheathed syringes/long cotton tipped applicators to practice angulation. The use of grapes to simulate penetra-

tion, and plums/peaches to simulate touching bone has been reported as helpful introductions to those experiences.

The most popular organization of student teams in the preclinic local anesthesia course setting is the “2-student approach” with the “3-student approach” gaining in popularity (Figure 1). The latter provides the additional opportunity to assign one student as an observer/assistant/coach facilitating a view of procedures from a different perspective. All roles can include feedback forms (patient, observer, operator) to support student attainment of competency. Students rehearse out loud, the detailed process of the injection, including naming the injection site and nerves affected.



Figure 1: 3-Student Approach

During the introductory course, evaluation strategies include the use of very detailed process forms to informally evaluate self and peers and competency forms (usually less detailed) are used for testing.

During the Introductory Course

- Student demonstrates angulation and fulcrum with cotton tip applicator while discussing the nerves anesthetized
- Student identifies insertion site while applying topical anesthetic
- During topical anesthetic application, instructor may move to another student who has applied topical and is ready to inject
- As student inserts, check for fulcrum, angle, thumb position, syringe window, depth, aspiration, deposition, withdrawal angulation and needle safety

During Subsequent Clinical Experiences

- Student identifies insertion site when applies topical
- Less supervision is needed as student attains/maintains competency

Armamentarium: The new, smaller and light-weight syringes are gaining in popularity: eliminating the need to cut syringes down to fit smaller hands. Cartridges should be of good quality and provide for ease of harpoon engagement and stopper glide. Needles with plastic hubs fit

Continued on Page 26



Figure 2: Instructor teaching and positioning

all syringes well, are easier to align with bevel, and are resistant to removing syringe hub (if present). The use of anesthetics with vasoconstrictor is recommended for safety. Several program directors remarked that in preclinic activities they have students provide the full textbook dosages, initially, and then, after demonstrating competency, repeat practice injections with lower doses. The use of articaine is not recommended for preclinic activities as students need to develop accuracy.

Instructor Teaching and Positioning: Demonstrate skills slowly and paint a verbal picture. Allow students to discuss what looks different than what they do and have the patient provide feedback. Clinic instructors should be comfortable teaching and evaluating ALL the injections, regardless of their personal philosophy and be able to incorporate the appropriate use of anesthesia when assisting students with development of treatment plans. After establishing line-of-site for observing penetration and advancement, observe the student from different positions. Provide positive feedback as you consider and compare program-approved alternative approaches.

Teaching Fulcrums: Begin by teaching standard fulcrums and popular variables for each injection and assist students with customizing to meet individual needs. Important criteria includes that the fulcrum used is safe and stable. Sometimes the “body fulcrum”

Threading content through the curriculum/collaborative learning opportunities:

Instructors need to understand the topic well enough to make connections throughout the curriculum:

- Head & Neck Anatomy
 - Discuss anatomical considerations
 - Demo insertion sites on skulls
- Intro DH (didactic)
 - Lay foundation: rationale for use
- Lecture
- Case studies
- Peer Observation
- Junior Clinic
 - Students observe instructors providing LA in isolated areas for patients with isolated deep pocket(s)
- Periodontology
 - Discuss during case study/case management
- Pharmacology
 - Fully discuss properties, mechanisms of action, dosing, drug interactions

Augment understanding of use of LA during:

- Special Patients Courses
 - Case studies
- Ethics Course
 - Ethical dilemmas
- Advanced Periodontology Courses
 - Case Studies
- 2nd year Clinical Practice Requirements
 - Add computer delivery and advanced injections/techniques

is useful initially, when hands are too small to stabilize on the patient's face. Reinforced fulcrums really help students' shaky hands: "hand/finger assist" fulcrums and resting barrel on thumb/finger of non-dominant hand while retracting.

Common Student Errors: Students frequently demonstrate insufficient retraction, poor use of light, improper angulation, needle movement at target, premature/rapid deposition, poor thumb position for aspiration, needle movement during aspiration, and a weak fulcrum.

Summary:

Local anesthesia is an important service we provide for our patients. Developing habits to increase our confidence, knowledge, and improve our technique is a professional, lifelong process. It begins in the educational setting. As educators, we should introduce the content as we would any other dental hygiene skill, thread it through the curriculum, and provide unbiased evidence-based strategies for treatment planning, delivery, and self-evaluation.

About the Author:

Laura J. Webb, CDA, RDH, MS, an experienced clinician, educator and owner of LJW Education Services, www.ljweduserv.com. Licensed in local anesthesia since 1980 Laura currently provides educational methodology courses and accreditation consulting services for DH/DA education programs and CE courses for professionals. She completed her undergraduate work at Foothill College Dental Hygiene Program and San Jose State University and holds a MS in Health Service Administration from University of St Francis. She has written and reviewed articles and textbook chapters for a variety of professional publications. In July 2010 she presented at the International Symposium of Dental Hygiene in Glasgow, Scotland on the topic of Maximizing Dental Hygiene Student Proficiency in Local Anesthesia.



Shanda Wallace,
RDH, BSDH
Class of 2011

Give Your Career A Boost Earn Your BSDH Degree Online

With over 50 years of dental hygiene experience, the Department of Dental Hygiene is dedicated to providing the highest quality education. Offering an environment for learning that emphasizes Christian values, intellectual development and community service, Loma Linda University encourages personal wholeness and professional growth.

- ◆ Online BSDH degree completion program
- ◆ Designed for licensed dental hygienists with a Certificate or Associate degree
- ◆ Two tracks available:
 - Dental Hygiene Education
 - Public/Community Oral Health Services
- ◆ Courses designed for the working professional
- ◆ Now accepting applications for March 2012 and September 2012

Contact us Today!
degreecompletion@llu.edu



LOMA LINDA UNIVERSITY
School of Dentistry
Department of Dental Hygiene

Pain Control Management



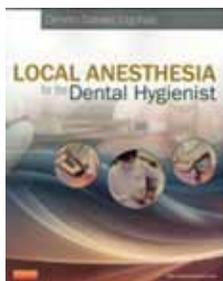
Septodont has recently launched the Septoproject® Evolution dental needle, engineered for easier insertion, reduced tissue displacement and increased patient comfort. The patented design features an innovative

scalpel shaped cutting blade which centers the bevel of the needle and reduces tearing and deflection upon penetration. Needle placement is easier to control and the operator is able to use less pressure on insertion thus reducing patient discomfort. **For more information visit www.septodont.ca/home**



Orabloc™, a new, purer formulation of Articaine with epinephrine, has recently been approved for use and distribution in the United States.

Manufactured by the Italian pharmaceutical firm, Pierrel, Orabloc™ is formulated using an aseptic method that reduces the quantity of degradation products and impurities that are by-products of the manufacturing process. Prior to the FDA approval of Orabloc™, the Articaine brands available for use in the United States have been manufactured using terminal sterilization methods. Orabloc™ also requires less overage of epinephrine, thus reducing the amount of vasoconstrictor in the formulation. The new product features a shelf life of up to 24 months and is available as Articaine hydrochloride 4% with epinephrine 1:100,000 and Articaine hydrochloride 4% with epinephrine 1:200,000. **For more information on Orabloc™, go to www.pierrel-research-usa.com**



Published in June 2011, **Local Anesthesia for the Dental Hygienist**, is the first local anesthesia textbook written specifically for dental hygienists. The textbook features full-color photographs and illustrations highlighting injection techniques and dental anatomy and includes technique/procedure boxes providing step-by-step instructions for performing each injection. In addition,

color-coded local anesthetic tables assist the clinician in selecting the appropriate anesthetic for each patient. This useful resource can be used chairside by students as well as experienced dental hygienists. **For additional information visit the publisher's web site, www.us.elsevierhealth.com**

CDHA Newsmakers



Known for her innovative teaching style, dedication to her students growth and success and her infectious sense of humor and smile, **Dani Carroll, RDH, MA**, was this year's recipient of the ADHA /Proctor and Gamble Dental Hygiene Educator of the Year Award. A 1983 graduate of the Cerritos College Dental Hygiene Program, Dani became a full-time faculty member at

her alma mater in 2002. As a teacher and ADHA Student Chapter Advisor, Dani empowers her students to succeed by treating them with respect and as peers. She plans to use her award monies to purchase computers for to enhance the intraoral photography capabilities in the school clinic. Congratulations Dani!

Maria Perno Goldie, RDH, MS was the recipient of the Alfred Fones Award presented at the ADHA Annual Session in June. Maria was recognized for her contributions to the profession over her many years as an ADHA member. Maria, an internationally recognized author, speaker and leader, is currently serving as President of the International Federation of Dental Hygienists.



Vickie Kimbrough-Walls, RDH, MBA, was the recipient of the Irene Newman Award at the ADHA Annual Session. This award is presented to a nominee who has demonstrated outstanding achievement in advancing the art and science of dental hygiene. Past President of CDHA, Vickie has been a dental hygiene program director for over ten years. While she was resid-

ing in Nevada at the time she received her award, she has recently relocated to the San Diego area where she will begin her appointment as the director of the Southwestern College Dental Hygiene Program.

From Across the Country



“Inspiration, Collaboration and Translation” is the theme of the 2nd North American Dental Hygiene Research Conference to be held October 20-23, 2011 in Bethesda, Maryland. Sponsored by the National Center for Dental Hygiene Research & Practice in collaboration with the American and Canadian Dental Hygienists’ Associations, this three day program promises to bring international speakers and researchers together to share the latest information related to oral cancer, tobacco cessation, bisphosphonate-induced osteonecrosis, and remineralization therapies. Training programs, workshops and small group discussions will promote professional development and networking opportunities. This conference is also ideal for the clinician who is dedicated to using best practices for enhancing patient care. Registration information is available at www.adha.org/research/research_conference.htm



Advanced Dental Therapists Graduate

The first class of advanced dental therapists in the nation graduated in June from Metropolitan State University in Minnesota. The seven graduates received a Master of Science: Oral Health Care Practitioner degree and will be eligible for credentialing as Advanced Dental Therapists in the state of Minnesota after fulfilling the required 2,000 hours of documented dental therapy practice. As mid-level providers, advanced dental therapists are able to provide basic and restorative care in Minnesota under the supervision of licensed dentists. The Minnesota model has been highlighted by the Pew Center on the States as one of four innovative approaches that stand out nationally for their potential to improve the dental health of children and other vulnerable populations. For more information on the history of mid-level providers in Minnesota, visit: www.adha.org/downloads/MN_Mid-Level_History_and_Timeline.pdf

Public Health Notes



New graphic warnings will be appearing on every pack of cigarettes sold in the United States as well as in every cigarette advertisement no later than September 2012. The nine different warning labels recently unveiled by the Food and Drug Administration aim to ensure that every American, young and old, understands the dangers of tobacco use, the leading cause of premature and preventable death in the United States. Each warning is accompanied by a smoking cessation phone number, 1-800-QUIT-NOW.

Fewer Californians are Lighting Up!

Recent reports from the California Department of Public Health indicate that smoking rates are down across all gender, ethnic and age groups in California. Overall there has been a 50% decline in tobacco use since 1988 when the Tobacco Tax Initiative, Proposition 99, went into effect. Education programs and the proliferation of policies banning and restricting smoking have been credited with contributing to the decline. It is important to remember however, that men, African Americans and people ages 25 to 44, still have the highest rates of tobacco use. Strong support networks such as the California Smokers Helpline continue to play an important role in increasing an individual’s ability to successfully quit using tobacco. Tobacco cessation resources and free materials are available at www.californiasmokershelpline.org



Potter the Otter Loves to Drink Water is the champion for water and the mascot for the ReThink Your Drink Campaign in Santa Clara County. Sponsored by FIRST 5 Santa Clara County, Santa Clara County Public Health Department, Kaiser Permanente and the Bay Area Nutrition & Physical Activity Collaborative, the annual campaign encourages families to reduce or eliminate drinking sugar sweetened beverages that are linked to the increasing incidence of obesity and diabetes in children. Free materials include educational action cards, Potter the Otter a Tale about Water story in English and Spanish, tip sheets. All materials are available on the web site: www.potterloveswater.com

Why I belong?

Laurel Bleak, RDH
CDHA member since 2001

"After being a dental hygienist for over 30 years, I am fortunate to still love clinical practice. Although I joined CDHA in 1977 after graduation, my membership lapsed for a number of years until I realized that it was important for me to support our professional organization. Membership in CDHA has allowed me to explore other facets of dental hygiene. I am now giving back to my community and mentoring others. I have also been able to help shape policy for our profession and expand my leadership skills at the local, state and national levels."



Why I belong?

Michael Long, RDH
CDHA member since 2004

"I became a CDHA member as a Santa Rosa Junior College dental hygiene student. CDHA membership has given me a tremendous sense of fellowship and direction in my professional life. I have mentorship relationships with other CDHA members that have amplified me to a high level of professionalism. My involvement at the component level has opened many doors for me allowing me to join an amazing group of public health leaders and other dental professionals to make a difference in the oral health of my community and beyond. I am a lifetime CDHA member, no ifs, ands or buts about it!"



CAL-HYPAC: YOUR POLITICAL VOICE!

The Political Action Committee for California's Dental Hygienists

Cal-Hypac keeps your voice strong by:

- Educating legislators about issues of importance to dental hygienists
- Supporting legislators who understand the needs of our profession
- Supporting legislators who are oral health advocates for all Californians

Recent legislative victories for California dental hygienists:

- Self regulation with the establishment of the Dental Hygiene Committee of California (DHCC)
- Placement of dental hygiene education standards and duties into state law
 - Any changes to dental hygiene duties in California require legislative action

What happens in Sacramento shapes the future direction of the dental hygiene profession! Only you can make a difference in your future and in the oral health of all Californians!

Please contribute to CAL HYPAC today!

Make checks payable to: CAL HYPAC • c/o Elena Gimpel, secretary/treasurer
44279 Cabo Street • Temecula, CA 92592

Fair political Practice Act requires you to include the name of your employer with your check.
Your contributions are not tax deductible for state or federal income tax purposes.



It's state of the art.
It's a state of mind.
It's Zen.



The Ergonomic Prophy Experience

By combining a lightweight, powerful handpiece with a wireless rheostat foot pedal, you get an ergonomic experience like never before. Relax, your world has just gone cordless.

Enter the comfort zone...

- Ergonomic contour and non-slip grip
- No cords allows a neutral position without fighting cord drag
- 16 grams lighter than the current market leader*
- Form-fitting, sure-grip barrier shell eliminates use of slippery barrier sleeves
- Place the wireless foot pedal anywhere within reach



For more info call:
(800) 422-9448
or visit discusdental.com/zen.php

*Data on file.
© 2011 Discus Dental, LLC. All rights reserved.
For use by a dental professional only.
ADV-3423 070811

DISCUS™

A Philips Company



Rosie Tesselaar, Executive Administrator
California Dental Hygienists' Association
130 North Brand Boulevard, Suite 301
Glendale, CA 91203

Presorted STD
U.S. Postage
PAID
Permit No. 104
San Dimas, CA

CDHA2008

RETURN SERVICE REQUESTED

Where:
San Mateo Marriott
1770 South Amphlett Blvd
San Mateo, CA

Saturday
October 29, 2011

10TH ANNUAL FALL CDHA CE EXTRAVAGANZA

Featuring:
Maria Perno Goldie, RDH, MS
*“When the Body Turns on Itself:
Autoimmune Disorders”* 3 CEUS

A N D

JoAnn Gurenlian, RDH, PhD
*“Diabetes Mellitus: Strategies for
Providing Comprehensive Care”* 3 CEUS

Exhibitor’s Showcase

Register today at
www.cdha.org
or call 818-500-8217

SEE YOU THERE!