_c.e. article_
The role of the dental team in the management of the patient with sleep apnea

_clinical_
Handpiece technology: What are you using?

trends
Soda, sensitivity and a strategy
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The goal of this quarterly magazine is twofold. First, it seeks to share practical dental hygiene knowledge that can be put to use in your day-to-day work. Second, it is a vehicle to help you chip away at continuing education requirements.

The amount of new information available in dentistry about products, techniques and research is astounding. It’s difficult to find time to catch up on the latest clinical news and product information. Thus, we hope *hygiene* will not only be a welcome respite for those rare chunks of time you can devote to reading, but one that provides a practical return on your investment by providing information that you can put to immediate use.

For this first issue of the North America edition of *hygiene*, we’ve assembled a collection of articles from a diverse group of contributors, each recognized in the profession as a thought leader and respected peer. One example in this issue is the detailed accounting of how important ergonomically correct seating is for dental professionals, especially for hygienists. Patti DiGangi, RDH, BS, and Judy Bendit, RDH, BS, draw on the world of auto racing and aviation to create a strong argument for the use of checklists to reduce the risk of potential injury associated with your work-related seating.

The ergonomics checklist article is just one of three C.E. articles in this edition. Every issue of *hygiene* magazine will contain C.E. content. That means that by reading the articles in this edition on ergonomics, sleep apnea and medical cross coding, and then taking a short online quiz at www.DTStudyClub.com, you can earn one hour of ADA CERP-certified C.E. credit. Because *hygiene* is quarterly, you can chisel four C.E. credits per year out of your already busy life without any lost revenue or time away from work. To learn more about this C.E. opportunity, visit www.DTStudyClub.com.

Annual subscribers to the magazine ($50) need only register at the Dental Tribune Study Club website to access the C.E. quizzes free of charge. Non-subscribers may take the C.E. quiz after registering on the DT Study Club website and paying a nominal fee.

If you have a penchant for words, it might also interest you to know that authors of the C.E.-accredited articles receive 15 percent of the fees collected from the non-subscribers who take the C.E. quiz online.

I know that taking time away from work to pursue C.E. credits can be costly in terms of lost revenue and time, and that makes *hygiene* a valuable publication. I hope you enjoy this first issue and that you get the most out of it that you can.

Sincerely,

Torsten Oemus
Publisher
clinical

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Cover image by Karoline Cullen, www.dreamstime.com
Protection from the risk of sensitivity

The protection behind the polish

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Handpiece technology: What are you using?

George F. Green from Kalamazoo, Mich., patented the first power dental handpiece in 1875. History indicates his handpiece was “too heavy to hold and very expensive to run,” only operating at 400 rpm. Many improvements have been made to today’s equipment as ergonomists recommend manufacturers “develop new and better ways to optimize the performance of people using technology to perform work more effectively.”

Dental hygienists often utilize a low-speed handpiece designed for restorative procedures. Slow-speed handpieces are designed to cut and finish restorations, remove decay and repair appliances. A variety of components are required for the hygienist to convert the low speed to a polishing handpiece. This would include a slow-speed motor, a straight attachment and a contra angle or disposable prophylaxis angle.

Considering the increased length, slimmer diameter, higher speed range, additional weight of the handpiece, and cord, the dental handpiece is not ideal for the ergonomic and procedural requirements of dental hygienists (Table 1).

Significant interest has been given to the development and improvement of the hygiene-specific handpiece. Design modifications for hygiene handpieces include reduced length, speed, vibrations, noise, weight, and grip size (Table 2). These adjustments are an attempt to improve the hygienists' hand position along with improving the efficiency and effectiveness of the equipment.

The type of handpiece can also affect the procedural outcome for the patient. “Polishing for 30 seconds with a pumice paste may remove as much as 4 µm of outer enamel,” which is the fluoride rich surface.

An increase in speed will increase the rate of surface abrasion. Tissue trauma and heat may also increase with higher rpm. Hence, it is recommended that the handpiece should operate at a low rpm.

Many dental equipment manufacturers offer air-driven dental hygiene handpieces. There is a broad assortment in features between each manufacturer. When choosing a hygiene-specific handpiece, select a comfortable, ergonomic design with features that improve the polishing procedure.

Specifications ergonomists currently advocate in a premium dental hygiene handpiece design include light weight and good balance, to allow for a relaxed grip, and a non-slip surface for ease of control.

It is also highly recommended that the handpiece have a larger diameter to increase the pinch width of the operator to reduce the possibility of cumulative trauma disorders.

A swivel mechanism is another feature to consider. A swivel mechanism in combination with the other features mentioned can reduce the pinching effect and allow the operator to move the handpiece with minimal effort.

The latest advancement in technology includes cordless, battery-operated handpieces. These new designs eliminate the cord and incorporate an electric motor.

These rechargeable motors allow hygienists to polish unrestricted with the same advantages in reduced rpm, weight and balance over the air-driven, slow-speed handpiece.

Another improvement with these handpieces is in sterilization and infection control. The outer sheath is removable for sterilization. The time required to

Author: Shirley Branam, RDH, MBA

Fig. 1 In 1996, Midwest introduced the first ever a hygiene specific low-speed handpiece, the Midwest RDH, uniquely designed with the hygienist's needs in mind, and continues to lead the hygiene handpiece market today. (Photos/Provided by Shirley Branam, RDH, MBA)
Needle-free, anesthetic gel

Oraqix® propels your SRP procedures forward

Of the SRP patients who required localized anesthesia, almost 70% expressed a preference for gel over injection.²

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Oraqix is indicated for adults who require localized anesthesia during scaling and/or root planing. Oraqix is not for injection. Oraqix is contraindicated in patients with known history of hypersensitivity to local anesthesia of the amide type or to any other component of this product. The most common adverse reactions in clinical studies were application site reactions, headaches and taste perversion. For Oraqix prescribing information, warnings and contraindications, see the product insert on opposing page.

INDICATIONS AND USAGE
Craqui® is indicated for adults who require local anesthesia in peridental pockets during scaling and/or root planing.

CONTRAINDICATIONS
Craqui® is contraindicated in patients with a known history of hypersensitivity to local anesthetics of the amide type or to any other component of the product.

WARNINGS
Prilocaine can cause elevated methemoglobin levels particularly in conjunction with methemoglobin-inducing agents. Methemoglobinemia has also been reported in a few cases in association with lidocaine treatment. Patients with glucose-6-phosphate dehydrogenase deficiency or congenital or idiopathic methemoglobinemia are more susceptible to drug-induced methemoglobinemia. Craqui® should not be used in those patients with congenital or diaphoretic methemoglobinemia and in infants under the age of twelve months who are receiving treatment with methemoglobin-inducing agents. Signs and symptoms of methemoglobinemia may be delayed some hours after exposure. Initial signs and symptoms of methemoglobinemia are characterized by a slate gray cyanosis seen in, e.g., buccal mucous membranes, lips and nail beds. In severe cases symptoms may include central cyanosis, headache, lethargy, diziness, fatigue, syncope, dyspnoea, CNS depression, seizures, dysphonia and shock. Methemoglobinemia should be considered if central cyanosis unresponsive to oxygen therapy occurs, especially if methb-inducing agents have been used. Calculated oxygen saturation and pulse oximetry are inaccurate in the setting of methemoglobinemia. The diagnosis can be confirmed by an elevated methemoglobin level measured with co-oximeter. Normally, methb levels are <1%, and cyanosis may not be evident until a level of at least 10% is present. The development of methemoglobinemia is generally dose related. The individual maximum level of methb in blood ranged from 0.3% to 1.7% following administration of the maximum dose of 5.5 g Craqui®.

Management of Methemoglobinemia: Clinically significant symptoms of methemoglobinemia should be treated with a standard clinical regimen such as a slow intravenous injection of methylene blue at a dosage of 1-2 mg/kg given over a five minute period.

Patients taking drugs with drug-induced methemoglobinemia such as sulfonamides, acetaminophen, acetazolamide, aniline dyes, benzoic acid, chloropamide, dapsone, naphtalene, nitrates and nitrites, nitrofurantoin, nitroglycerin, nitroprusside, pamaquine, para-aminosalicylic acid, phezeain, phenobarbital, phenyl, pramacine, and quinine are also at greater risk for developing methemoglobinemia. Treatment with Craqui® should be avoided in patients with any of the above conditions or with a previous history of problems in connection with prilocaine treatment.

PRECAUTIONS
General: DO NOT INJECT Craqui® should not be used with standard dental syringes. Only use these product with the Craqui® Dispenser, which is available from DENTSPLY Pharmaceuticals. Allergic and anaphylactic reactions associated with lidocaine or prilocaine can occur. These reactions may be characterized by urticaria, angioedema, bronchospasm, and shock. If these reactions occur they should be managed by conventional means.

Craqui® coming in contact with the eye should be avoided because animal studies have demonstrated severe eye irritation. A loss of protective reflexes may allow corneal irritation and potential abrasion. If eye contact occurs, immediately rinse the eye with water or saline and protect it until normal sensation returns. In addition, the patient should be evaluated by an ophthalmologist, as indicated.

However, Craqui® should be used with caution in patients with a history of drug sensitivities, especially if the etiologic agent is uncertain.

Patients with severe hepatic disease are at greater risk of developing toxic plasma concentrations of lidocaine and prilocaine.

Information for Patients: Patients should be cautioned to avoid injury to the treated area, or exposure to extreme hot or cold temperatures until complete sensation has returned.

Drug Interactions: Craqui® should be used with caution in combination with dental injection anesthesia or other local anesthetics, or agents structurally related to local anesthetics, e.g., Class I antiarrhythmics such as tocainide and mexiletine, as the toxic effects of these drugs are likely to be additive and potentially synergistic.

CARCINOGENESIS, MUTAGENESIS, IMPAIRMENT OF FERTILITY:
Carcinogenesis - Long-term studies in animals have not been performed to evaluate the carcinogenic potential of either lidocaine or prilocaine. Chronic oral toxicity studies of o-tolidine, a metabolite of prilocaine, have shown that this compound is a carcinogen in both mice and rats. The tumors associated with o-tolidine included hepatocarcinomas/adenomas in female mice, multiple occurrences of hemangiosarcoma/hemangiomata in both sexes of mice, sarcomas of multiple organs, transitional cell carcinoma/papillomas of urinary bladder in both sexes of rats, subcutaneous fibromas/fibrosarcomas and mesotheliomas in male rats, and mammary gland fibroadenomas/adenomas in female rats. These findings were observed at the lowest tested dose of 150 mg/kg/day or greater for over two years (estimated daily exposures in mice and rats were approximately 6 and 12 times, respectively, the estimated exposure to Craqui® at the maximum recommended human dose of 8.5 g of Craqui® gel on a mg/m² basis). Complete conversion of prilocaine to its metabolite o-tolidine on a molar basis is assumed. This gives a conversion on a weight basis of about 50% for prilocaine base (dependent on the molecular weights, i.e. 220 for prilocaine base and 107 for o-tolidine).

Mutagenesis - o-Tolidine, metabolite of prilocaine, was positive in Escherichia coli DNA repair and phage-induction assays. Urine concentrations from rats treated orally with 300 mg/kg o-tolidine were mutagenic to Salmonella typhimurium in the presence of metabolic activation. Several other tests on o-tolidine, including reverse mutations in five different Salmonella typhimurium strains with or without metabolic activation, and single strand breaks in DNA of V79 Chinese hamster cells, were negative.

USE IN PREGNANCY:
Teratogenic Effects: Pregnancy Category B
There are no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, Craqui® should be used during pregnancy only if the benefit outweighs the risks.

Nursing Mothers: Lidocaine and, possibly, prilocaine are excreted in breast milk. Caution should be exercised when Craqui® is administered to nursing women.

Pediatric Use: Safety and effectiveness in pediatric patients have not been established. Very young children are more susceptible to methemoglobinemia. There have been reports of clinically significant methemoglobinemia in infants and children following excessive applications of lidocaine 2.5% topical cream (See WARNINGS).

Geriatric Use: In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosage range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy.

ADVERSE REACTIONS
A causal relationship between the reported adverse reactions and Craqui® could neither be established nor ruled out.

Following SRP treatment with Craqui® in 391 patients, the most frequent adverse events were local reactions in the oral cavity. These events, which occurred in approximately 15% of patients, included pain, soreness, irritation, numbness, vesicles, ulcerations, edema and/or reddness in the treated area. Of the 391 patients treated with Craqui®, five developed ulcerative lesions and two developed vesicles of mild to moderate severity near the site of SRP. In addition, ulcerative lesions in or near the treated area were also reported for three out of 168 patients who received placebo. Other symptoms reported in more than one patient were headache, taste perversion, nausea, fatigue, flu, respiratory infection, muscularkeletal pain and acidophilinity.

OVERDOSE
Local anesthetic toxicity emergency: If other local anesthetics are administered at the same time as Craqui®, e.g. topically or by injection, the toxic effects are thought to be additive and could result in an overdose with systemic toxic reactions. There is generally an increase in severity of symptoms with increasing plasma concentrations of lidocaine and/or prilocaine. Systemic CNS toxicity may occur over a range of plasma concentrations of local anesthetics. CNS toxicity may typically be found around 5000 ng/mL of lidocaine; however a small number of patients reportedly may show signs of toxicity at approximately 1000 ng/mL. Pharmacological thresholds for prilocaine are poorly defined. Central nervous system (CNS) symptoms usually precede cardiovascular manifestations. The plasma level of lidocaine observed after the maximum recommended dose (5 cartridges) of Craqui® in 11 patients exposed over 3 hours ranged from 157-652 ng/mL with a mean of 264 ng/mL ± 122 SD. The corresponding figure for prilocaine was 53-161 ng/mL, with a mean of 106 ± 45 SD. Clinical symptoms of systemic toxicity include CNS excitation and/or depression (light-headedness, hyperacusis, visual disturbances, muscle tremors, and general convulsions) Lidocaine and/or prilocaine may cause decreases in cardiac output, total peripheral resistance and mean arterial pressure. These changes may be attributable to direct depressant effects of these local anesthetic agents on the cardiovascular system. Cardiovascular manifestations may include hypotension, bradycardia, arrhythmias, and cardiovascular collapse.

Management of Local Anesthetic Emergencies: Should severe CNS or cardiovascular symptoms occur, these may be treated symptomatically by, for example, the administration of antiarrhythmic drugs, respiratory support and/or cardiovascular resuscitation as necessary.

DO NOT FREEZE. Some components of Craqui® may precipitate if cartridges are frozen. Cartridges should not be used if they contain a precipitate.

Do not use dentine cartridge warmers with Craqui®. The heat will cause the product to gel.

Rx only

Manufactured for: DENTSPLY Pharmaceuticals York, PA 17404
By: ReckPharm Arkaberg AB Karlstoga Sweden
Rev. 09/2010
sterilize an air-driven handpiece is considerably longer because the entire handpiece takes time to cool down. The advantage of battery-operated handpieces is only the removable sheath is sterilized, so the cool-down time is considerably less.

This is both a time saving and cost saving feature. The hygienist can operate with one handpiece motor and have multiple sheaths to rotate between during patient care.

Today’s technology has changed to meet a variety of procedural and ergonomic recommendations. The design features, specifications and dedicated low-speed hygiene handpieces have been modified by manufacturers to meet the unique needs of the RDH. So the question is, “What are you using?”

References

Table 1 Low-speed dental handpiece

<table>
<thead>
<tr>
<th>Features</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined weight (g)</td>
<td>133</td>
</tr>
<tr>
<td>Combined length (mm)</td>
<td>146</td>
</tr>
<tr>
<td>Diameter (mm)</td>
<td>15.9</td>
</tr>
<tr>
<td>Single free speed (rpm)</td>
<td>8,000</td>
</tr>
</tbody>
</table>

Table 2 Low-speed hygiene handpiece

<table>
<thead>
<tr>
<th>Features</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>68.5–108.9</td>
</tr>
<tr>
<td>Length (mm)</td>
<td>61.7–91.6</td>
</tr>
<tr>
<td>Diameter (mm)</td>
<td>16.7–22.8</td>
</tr>
<tr>
<td>Free speed (rpm)</td>
<td>2,532–7,459</td>
</tr>
</tbody>
</table>

Shirley Branham, RDH, MBA, is the central clinical educator for DENTSPLY Professional. She received her bachelor’s degree in dental hygiene from the University of Michigan and earned an MBA degree in health care management from the University of Phoenix. Branham’s background includes more than 20 years of clinical and educational experience in the dental assistant and dental hygiene professions. While a member of the University of Michigan School of Dentistry, she held various appointments, including hygiene faculty member, staff hygienist in the Graduate Prosthodontic Clinic and research coordinator assistant. Branham’s areas of expertise include clinical dental hygiene, biomaterials, implants and local anesthesia. She lectures nationally and internationally for DENTSPLY Professional, covering topics on ultrasonic instrumentation, anesthesia, caries risk assessment and implant maintenance. You may contact her at shirley.branam@dentsply.com.
Checklists not just for pilots anymore

Authors: Patti DiGangi, RDH, BS, and Judy Bendit, RDH, BS

_C.E. article_ ergonomics

With popularity of the television show “Mad Men,” 1960s themes such as war, racism and sexism are memorialized, as are once-common habits such as smoking. Women were marketed to in the 1960s with their own cigarette brand that had the catch phrase, “You’ve come a long way, baby.” Following release of Smoking and Health: Report of the Advisory Committee to the Surgeon General of the United States, all smoking-related advertising was banned from TV in 1970.

Sit-down dentistry also evolved in the 1960s. “You’ve come a long way, baby” is gone from advertising, but it remains an accurate slogan when it comes to ergonomics in dentistry. We have come a long way, but for many dental professionals, that’s still not far enough.

In 1937, pilots developed the concept of the checklist after planes began crashing. Dental professionals may not be crashing in the literal sense, but many clinicians have been forced into early retirement because of musculoskeletal disorders (MSD) or they continue to try to work through them. By incorporating a checklist concept similar to that used by pilots, dental professionals can be more successful, productive — and able to practice without pain.

_Pain in dentistry_

Pain in dentistry is a common fear that keeps patients away from the dental office. Pain in dentistry is common, but has nothing to do with the patient. The individuals having pain in dentistry are the practitioners. It is estimated that more than half of practitioners have some kind of painful musculoskeletal disorder that is work related.

In 2007, the Center for Health Workforce, funded by the American Dental Hygienists’ Association (ADHA), conducted a sample survey of licensed dental hygienists about a wide variety of issues, including occupational injury or illness related to their work. It was reported that just more than one-third (33.8 percent) indicated they had experienced an occupational injury or illness. Figure 1 shows the types and percentages of occupational injury or illness experienced. More than half (53 percent) used medication to control the discomfort and nearly half (49.5 percent) indicated they had shortened their work hours as a result of their injury or illness.

Ergonomics evolved as a recognized field during World War II. It is the science of adjusting the work environment to the worker. The Occupational Safety and Health Administration (OSHA) has links to ergonomic information. The American Dental Association (ADA) published Introduction to Ergonomics with suggested interventions and in 2011 published Ergonomics for Dental Students. The ADA website has an ergonomics section with links to fliers about specific problems. Even with numerous articles and C.E. courses (both in person and online) on ergonomics in the five years since the ADHA survey, MSDs

---

_Fig. 1_ Type of occupational injury or illness experienced by dental hygienists with employment-related injury or illness, 2007. (Chart/Provided by the Center for Health Workforce and American Dental Hygienists’ Association)
continue to escalate. Much of this is because of a hand-me-down mentality in many dental offices.

For the safest flight, pilots use many checklists. In dentistry, a one-size-fits-all checklist is not enough to evaluate how we do things because of the wide variety of body types, shapes and preferred work styles. This article will develop checklists for dental-operator seating, just one of the many parts creating a healthy ergonomic environment.

Checklists help find the way

In the days of early aviation, pilots were crashing because they could not reach the controls. Investigators found it was pilot error as the cause. Pilot error doesn’t necessarily mean the pilot did something wrong; it can mean the pilot wasn’t familiar with the equipment or the equipment didn’t match the pilot. For those who work in a temporary dental situation at multiple offices, ergonomic challenges are huge. When such practitioners walk into a new office, trying to match their individual needs to the available equipment is nearly impossible.

Pilot checklists were developed to match the steps needed for the job, making sure that everything is done and nothing is overlooked. Checklists have become fundamental to the aviation industry. In a similar way, checklists should become fundamental to the dental industry.

Two books, “The Checklist Manifesto: How to Get Things Right” by Dr. Atul Gawande, a surgeon, and “Safe Patients, Smart Hospitals” by Dr. Peter Pronovost, discuss checklists as an effective way to reduce medical errors. These books are not just about the checklists, they are about the culture of medicine and how the checklist can foster better teamwork. Checklists are starting to become common in some hospital settings, but not nearly common enough. It takes a change of culture to adopt something that on the surface can seem so simple — as a core strategy for enhancing care.

A recent success story illustrates the difference checklists can make in medicine. The intensive care unit (ICU) at a hospital is a crucial part of health care delivery and one of the most complex and expensive. The Centers for Disease Control (CDC) reported that nearly every patient admitted to an ICU experiences some type of complication during his or her stay. Checklists were used in the Michigan Keystone Project to make patient care safer in more than 100 ICUs in Michigan. The project targeted the expensive and potentially lethal catheter-related bloodstream infections that cost $18,000 when a patient contracts one and causes 24,000 deaths per year. The Keystone team made a checklist, measured infection rates — and changed hospital culture. There was a 66 percent reduction in this type of infection statewide, saving more than 1,500 lives and $200 million in the first 18 months of the program. It was the combination of checklists and the culture of teamwork that made the difference.

Race car drivers and race cars take quite a beating during a race, both physically and mechanically. Like pilots, race car drivers and their teams use checklists. The teamwork of a pit crew during a race is artistry to watch that is fostered by checklists. Steve Knight, once a professional Le Mans race car driver and business turnaround specialist, has taken lessons from racing and brought them to dentistry. His goal is to turn around the world of seating for dental hygienists and all dental professionals.

Seating risk factor checklist

Before Knight got into a Le Mans car there were many considerations to be addressed. An impression of the driver’s body is taken to ensure a perfect fit into the seat of the car for optimal performance. This molding created: proper leg-stretch to reach the clutch, accelerator and brake; comfort in reaching and holding the steering wheel; and most important, the ability to sit comfortably for long periods of time. Today, as a business turnaround specialist, Knight brings lessons from racing to dentistry. His goal is to turn around the world of seating for dental hygienists and all dental professionals.
while driving around the race course. Success for a
top-level race car driver is driven by a strict regimen
for eating, exercise and nearly all activities of daily life
so they can be in top shape physically. It is the total
package, including the racing team and pit crew all
using checklists, that creates this success.

The idea of a form-fitting chair for dental practi-
tioners might not be practical, yet think of the pos-
sibilities. Those same ideas can be brought into the
treatment rooms with the "Seating Risk Assessment
Checklist" shown in Table 1. This checklist helps to
evaluate overall balance. Many professionals have
damaged themselves by repeatedly sitting, leaning,
stretching and twisting for so many years. As Cindy
Purdy, RDH, BS, consulting with Crown Seating re-
cently said to an online group, "Changing stools alone
will not treat medical issues, but it can certainly offer
benefits for the future."15

Now take that reclined position and rotate the
torso on its axis to create the inverse position, called
an inclined position17 (Fig. 6). Incline is the automatic
position created when sitting on a horse or a saddle
stool. It is a more balanced position. This balance
helps preserve the hips and spine in the proper posi-
tion. It is defined as an open body position that is
more comfortable, less harmful and allows for proper
lumbar curvature. The pelvis rotates downward and
forward, enabling the knees to stay below hip level.
This creates less stress and strain on the back, neck
and shoulder muscles. A slight incline of the seat
(5-15 percent) is ideal. If you adjust more than 20
percent out of a neutral position for an extended
period of time, muscle imbalances are created, which
means the muscles are adaptively shortening on
one side and elongating on the other. This results in
misalignment of the spine and joints, and in this case,
the hip joint. When a person sits properly on a saddle
seat, the pelvis is properly positioned and stabilized,
so the body naturally and automatically assumes the
least-stressful position.

A more comfortable sitting position for most is in
a reclined position (Fig. 5). Think of your comfortable
recliner in front of the television after a long day of
work or the experience sitting in a first-class seat on
a plane. Reclining is so very comfortable. This is the
way race car drivers sit; but it’s not very practical for
treating dental patients.

Now take that reclined position and rotate the
torso on its axis to create the inverse position, called
an inclined position17 (Fig. 6). Incline is the automatic
position created when sitting on a horse or a saddle
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so the body naturally and automatically assumes the
least-stressful position.

For sitting positions, there are two more checklist
considerations. In traditional chairs, the practitioner
sits in a static position that does not provide much
movement or stimulation of the muscles. A new
term has been given to some of the advanced-design
chairs: dynamic seating. The dynamic chair offers the

<table>
<thead>
<tr>
<th><strong>Table 1. Seating Risk Assessment Checklist</strong> (Table adapted from the Occupational Safety and Health Administration’s 'Checklist for Ergonomic Risk Factors')</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Things to look for</strong></td>
</tr>
<tr>
<td>Prolonged hunched or elevated shoulders</td>
</tr>
<tr>
<td>Twisting head to side</td>
</tr>
<tr>
<td>Elbow flexed for long periods</td>
</tr>
<tr>
<td>Wrists extended or flexed for long periods</td>
</tr>
<tr>
<td>Prolonged sitting, especially in one position</td>
</tr>
<tr>
<td>Lumbar back area not supported</td>
</tr>
<tr>
<td>Feet dangling, not well supported</td>
</tr>
<tr>
<td>Posture that puts pressure on the back of the thighs</td>
</tr>
<tr>
<td>Twisted torso</td>
</tr>
<tr>
<td>Frequent, prolonged leaning or reaching</td>
</tr>
<tr>
<td>Neck extended backwards, head titled back</td>
</tr>
<tr>
<td>Neck severely flexed downward</td>
</tr>
</tbody>
</table>
option of movement, allowing the muscles to both contract and relax while one remains seated. Prolonged muscle contraction results in increased pressure of the blood vessels in the muscle, creating a decreased blood flow through the muscle. Blood flow assists in the repair and health of the muscles by delivering oxygen to the muscle and removing waste products in the muscle that might otherwise cause localized, intense pain (ischemia). A dynamic chair allows a period of rest and rebuilding for the muscles needed for healthy seating. In some dynamic stools the seat pan moves; with others it’s the seatback that moves forward and backward as you move; and, with some, all parts of the chair move. In any case, these chairs help strengthen the body’s core.

Seating materials

A chair can be made of rubber, plastic, leather, mesh or other man-made materials that may or may not breathe. These materials can make a difference in comfort depending on where you live. In the South, or if there is high humidly in the office, a practitioner might complain about the material of the seat. If there is sweating while sitting, the seat may not allow the legs and back to breathe. This can be uncomfortable and/or embarrassing. Asking the manufacturer about options for breathability is the best choice. There are new fabrics that control odor and stain-causing bacteria.

With or without arms

Many practitioners wonder if they should or shouldn’t have arms on their chairs. The answer depends on how that individual works. If the person’s arms are always flapping in the breeze because the patient isn’t seated back properly, then arms on the chair will not help. It is imperative for the patient to either lay back in the appropriate position, or the practitioner must stand. One suggestion is instead of saying “Ok, let’s put the chair back and get started,” the practitioner says, “Let’s put the chair back and get both of us comfortable.”

They are very similar phrases with very different meaning. Patients are not the only ones who need to be comfortable; the best work can happen when everyone is comfortable. How many times during the day do practitioners stop to get comfortable? Usually none. Health care providers often worry more about patient comfort and end up compromising themselves all day long, leading to pain and injury.

Goldilocks theory of seating

Chairs are often inherited from someone else when first employed in a different practice. Steve Knight’s Goldilocks™ theory is like the old story, sometimes it’s too tall or too short and no matter how much it is adjusted, it is still not just right. Not getting that just-right position will lead to pain and other issues. Many companies can exchange the cylinder in a stool, for different heights to make it just right. Checking with the supplier or the manufacturer of the stool is the best way to find out if the cylinder can be changed to create a better fit. The important lesson is: Don’t just try to live with it; it hurts the practitioner, the patients, and eventually, the practice’s bottom line.

Considering alternative seating may be the best choice. Creating a checklist for buying a new chair (Table 2) can help you find the best one for your needs. A new chair may be needed because some chairs can’t be jury-rigged enough to fit. Other issues also play a part. Some patient chairs are extremely wide, or our patients can be very broad. This can make it impossible to work close enough when seated in a traditional stool. The saddle stool allows much closer access to the patient, so tasks can be accomplished with less stress.
Questions to ask

Does the seat pan fit your shape?
What kind of height adjustments does it have?
What kind of lumbar support?
Does the chair have at least five coasters?
Is the chair static or dynamic? Which is best for the individual?
Does the seat pan decline?
How will this chair fit with the patient chair?
Does the company have fabric options?
Is the fabric breathable? Is it odor or stain resistant?
Does the manufacturer offer an opportunity to try it for a few days before you buy it?

Table 2. Checklist for buying a new chair

- The professional should not have to reach more than 15 inches. The light, instruments on the bracket tray, the handpieces, the computer or anything needed for patient care should be within arms-reach. Straining for items stresses the muscles in the neck and shoulder. The biggest culprit is the overhead light. A headlight attached to loupes is no longer a choice; it is a necessary part of a healthy ergonomic armamentarium.

Checklists and the culture of teamwork

Hospital checklists are saving lives and money. Pilots use several different checklists for every flight to prevent pilot error and crashes. Winning race car teams and race car drivers use checklists for every race. Dentistry can use checklists to great benefit as well. We’ve come a long way, yet dentistry still has a way to go. It won’t happen without a change of culture. First, the problem must be recognized, hopefully before there is serious damage.

Dental professionals know that before there is a cavity, before there is periodontitis, before there is oral cancer; there is a risk for a cavity, periodontal disease and oral cancer. Preventive care and early detection is the purpose of routine hygiene care. Half or more of those reading this article already have MSDs; the other half are probably accumulating damage but haven’t reached critical mass to experience symptoms.

Dental professionals are caring individuals who don’t have to hurt themselves to help others. Ultimately not sitting comfortably hurts the practitioners, the patients and the practice bottom line. With simple ergonomic seating checklists professionals can be more successful at practicing in a pain-free environment.

References

Have you lost the excitement? Are you content with what you might now perceive as the same-old, same-old every day? Day after day you may be performing hygiene procedures over and over again, all the while knowing you are helping your patients but perhaps you simply don’t feel as though you are truly making a significant difference in their overall health. If you feel that level of frustration, or even if you don’t, but you are interested in advancing your career, then read on to discover some ways in which you can make a significant difference in the health of your patients.

As you are aware, dentistry is becoming recognized as a medical discipline. We in the dental field are in a unique position to support our patients’ overall body health. Our patients who maintain their regular recare schedules are quite probably seen by us more frequently than they are seen by their primary care providers. “Around 39 percent of adults see their physicians in a year while 64 percent see their dentists, which means we see 25 percent more patients than they do.”¹

Hygienists can be key players in this opportunity. By thoroughly questioning their new patients and by providing and reviewing medical history forms that are updated with the most current medical questions, hygienists can begin an evaluation of their patients’ medical state. In addition, our established patients may have had a change in their medical history since their last appointment, so a recare update form is an efficient way to inquire about their health. If your practice is not familiar with recare update forms, please check my website to obtain a copy. Again, thorough questioning of all new and established patients is an essential component to getting the full picture of your patients’ health.

What is discovered from these questions can be a strong determining factor in how each patient is handled. Patient questioning should always be followed by dental exams, X-rays, blood pressure checks and clinical observations. For those patients who may have a systemic disorder, your practice should become proactive by referring the patient back to his or her primary care provider.

However, because dentistry has evolved over the last decade, there are more ways that the dental practice can help make these determinations. With the frequency of patients’ visits and the availability of numerous cutting edge diagnostic tools, we have the unique opportunity to administer different types of disease testing that, in the past, were performed only by medical practices.

If you are unfamiliar with the types of medical testing that are available for dental practices to perform, then the following information can make a big difference in the quality of your practice’s treatment, and it may help to make a significant change in how you perceive your career.

First of all, periodontal diseases and caries are bacterial infections, but the majority of dental practices diagnose these conditions through the use of periodontal probes and explorers. Have you considered that medical practices would never begin treatment without determining if they are treating bacteria or a virus? In dentistry, we need to differentiate between aspirin sensitivity, blood dyscrasias, other diseases, fungus, yeast or a cyst; so bacteriologic tests should be performed.² Microscopic tests, DNA tests, or bac-

Author: Marianne Harper

The power of cross coding: How hygienists can support their patients’ overall body health

This article qualifies for C.E. credit. To take the C.E. quiz, log on to www.dtsstudyclub.com. The quiz will be available on Oct. 18.
Cross coding

C.E. article

Cross coding tests should be performed if periodontal infections are apparent. Tests that can be performed in a dental practice:

- HgA1c for blood sugar
- C-reactive protein (CRP) for inflammation
- BANA for bacterial pathogens or their byproducts
- DNA for the presence of specific pathogens or for patient susceptibility to periodontal disease
- TOPAS for inflammatory markers
- Oral HPV testing
- Diabetes testing with a glucometer — finger stick or blood sample taken from a periodontal pocket
- Oral cancer screening (e.g. ViziLite)
- HIV testing
- Screening for cardiovascular disease (e.g. HeartScore System)
- Saliva biomarker test — measures three specific biomarkers that play a role in cancer development in the oral cavity

As you can see, these tests cover many possible systemic conditions. Your practice will have to determine which staff members are allowed to administer these tests, because your state makes regulations controlling this. Hygienists may be allowed and, if so, this may make a difference in your career. Even if hygienists are not allowed per your state’s regulations, your encouragement in the practice to add these tests to the practice’s procedure mix will be invaluable to the practice. In addition, hygienists need to realize the importance of their observations and questioning of the patients in helping to move these patients to better overall health. This puts a new slant on the same-old, same-old.

Power of cross coding

There is, however, another area in which hygienists can make a significant difference in their practices. Dental-medical cross coding is a cutting edge insurance system whereby dental practices can file a patient’s medically necessary dental procedures with their medical plans. Implementing cross coding creates greater case acceptance resulting in increased patient affordability and practice profitability. Hygienists can play a key role in the implementation of cross coding. Hygienists can be the communicators for cross coding in their practices by alerting the practice of patients whom they believe are medically compromised. Such patients are excellent candidates for cross-coded claims.

As an example, hygienists can inquire about conditions that might indicate that a patient has sleep apnea (Fig. 1). For those practices that treat sleep apnea, the practice would then refer the pa-
tient for a sleep study before commencing treatment. If the practice does not treat sleep apnea, this referral would at least get the ball rolling for treatment by another provider.

Hygienists can also be the champions for cross coding by encouraging that their practices implement a cross-coding system. In most practices, the business office staff will need to play a significant role, but the hygienists can spearhead the process.

There are significant differences between dental and medical claims. The biggest difference is that, at present, medical insurance is diagnosis driven while dental insurance is not as of yet. Medical insurance uses diagnosis codes to explain why a procedure was performed. Without at least one appropriate diagnosis code, a claim will not be paid. The diagnosis codes are titled ICD–9–CM. The procedure codes are titled CPT codes. At present, there are growing numbers of dental related diagnosis codes, which are very helpful when cross coding. However, it is not so easy to use the CPT codes because there are so few dental CPT codes. This is the area that makes cross coding more difficult. The medical claim form is a bit different than the dental claim form. It is titled the CMS–1500 form and is printed in red ink (Fig. 2).

The form provides spaces for at least four diagnosis codes and six procedure codes. There are also other codes within these code systems that are used to give further diagnostic information or to provide information on why a procedure might have been modified by a specific circumstance. As you can see, cross coding is not an easy system to implement. The answer to easing the difficulty with cross coding is to take a good course on the topic. You also can check out my website, www.artofpracticemanagement.com, to see the different tools available to help dental practices implement cross coding.

As mentioned already, the patient’s benefit from cross coding is that medically necessary dental procedure can be made more affordable. It is possible to file the tests already mentioned with a patient’s medical insurance plan. There are diagnosis and procedure codes that apply to these tests, but those are too involved for the scope of this article to provide all of the codes needed. There is no guarantee that these tests would be covered by the plan. According to the Centers for Medicare and Medicaid Services, “the existence of a code does not, of itself, determine coverage or noncoverage.” It is certainly worth the effort of a phone call to determine coverage. I always advise practices that cross code and receive negative responses to encourage their patients to complain to their employers. Insurance contracts are between the insurance company and the employer, so dental practices have little power to make any plan changes. However, the more that complaints are issued, the more likely that medical insurance carriers will begin to see the necessity for including these types of procedures in their plans.

The full scope of cross coding is much more extensive than just these tests. Dental practices should be cross coding for the following:

- Trauma procedures
- Oral surgical procedures
- TMD procedures
- Sleep apnea procedures
- Medically necessary endodontic procedures
- Medically necessary implant and periodontal procedures
- Exams, radiographs and diagnostic procedures for any medically necessary dental procedure

Between implementing disease testing and cross coding, a hygienist will significantly make positive changes to his or her career. These hygienists will not only help patients obtain optimal health, but they can also help make procedures more affordable. Patients will be able to see their dental practice truly cares about their health and will have more confidence in the practice. This is a true win-win situation. The dental practice will value the contributions of these hygienists, and hygienists will rarely face each day with that “same-old, same-old” feeling.

References


About the Author

Marianne Harper is the CEO of The Art of Practice Management. Her areas of expertise include revenue and collection systems, business office systems and the training of dental practices in dental/medical cross coding. Harper is a consultant, trainer, lecturer and author. Her published works include “CrossWalking — A Guide Through the Cross Walk of Dental to Medical Coding” and her “Abra-Code-Dabra” series on medical cross coding for sleep apnea, TMD and trauma procedures. She also is the author of many articles published in dental journals. Contact her at The Art of Practice Management, 2217 Fox Horn Road, New Bern, N.C., 28562, or by email at a.p.m.1@suddenlink.net.
The role of the dental team in the management of the patient with sleep apnea

Author_ Nancy M. Costa-Larson, RDH, BS, MHA

The evolution of the dental hygienist’s role in the assessment of a client’s oral health from a singular approach to a collaborative multidisciplinary approach is evident in the treatment of clients with sleep disorders. Knowledge of the variations in sleep disorders, medications, treatment needed, as well as the various appliances will be vital to the dental health-care providers. Pagel (2012) says that by 2015, 40 percent of the U.S. population will have some form of sleep disorder; 18 million Americans have sleep apnea, which affects all ages, both sexes and may be genetic. The most prevalent form occurs in 4 percent of middle-aged men and 2 percent of middle-aged women.1

As with all medical conditions, early detection and baseline data will aid in monitoring changes in the patient’s health and providing useful information in treatment planning and implementation. Sleep apnea in the past has been viewed as most typically related to snoring; however, there are different types of sleep apnea disorder. The most prevalent and known is obstructive sleep apnea syndrome. Another type, central sleep apnea, is less common. A third type, complex sleep apnea, combines both the obstructive and central types.

What is obstructive sleep apnea syndrome?

Obstructive sleep apnea syndrome (OSAS) is a common, but under-diagnosed disorder that is potentially fatal.2 According to de Almeida et al. (2006),
“It happens most frequently during REM sleep, and breathing stops for 10 to 30 seconds, which results in reduced levels of oxygen dissolved in the blood.” The patient with the OSAS does not know this is happening. A person’s quality and quantity of sleep is often inadequate. These interruptions of sleep can affect a person’s mental and physical state — and lead to additional problems in the oral cavity.

_What is central sleep apnea?

Central sleep apnea is caused by the brain failing to signal the breathing-control muscles to work. With central sleep apnea, snoring is infrequent to rare because there is no airway obstruction. Though this disorder is less common than obstructive sleep apnea, it is important to address for the overall health of the sleeper. Oral appliances do not work in this situation. Central sleep apnea is diagnosed by sleep studies and typically treated with medications.

_What is complex sleep apnea?

Complex sleep apnea is a combination of obstructive sleep apnea and central sleep apnea. Some patients with obstructive sleep apnea develop central sleep apnea while on treatment with continuous positive airway pressure (CPAP). This article focuses on obstructive sleep apnea and how it relates to the oral cavity.

_Cause of obstructive sleep apnea syndrome

Tongue muscles, soft palate and uvula relax and/or sag (Fig. 2), causing snoring, difficulty breathing and breathing cessation. Obesity, alcohol consumption and sleep medications can exacerbate the condition. Snoring and gasping for air causes the person to wake several times a night, preventing the person from getting the proper sleep needed to function.

Sleep apnea is often present in people who are overweight, have physical abnormalities such as a deviated septum or have other abnormalities of the nose or throat. The sleeper tries to breathe, creating a tighter seal, which decreases oxygen flow to the brain. The sleeper awakens gasping for air.

_Effects and oral effects

Studies on sleep apnea are fairly new, and diagnostic evidence is evolving. Snoring is one of the symptoms of obstructive sleep apnea syndrome; however, not all individuals who snore necessarily have OSAS. Friedlander says, “Even when the airway is partially open, obstruction occurs frequently and results in a loud irregular snoring sound caused by air rushing through the narrow passage and stimulating the soft palate, uvula, throat walls and tongue to vibrate.” If an OSAS patient is left untreated, the condition can worsen over time. Risk can increase for hypertension, stroke, myocardial infarction, anoxic seizures and sudden death while asleep. Sleep apnea can be alleviated with oral devices and/or surgical procedures, however some complications have arisen in the oral cavity because of some of the devices used to correct or minimize obstructive sleep apnea.

_Signs and symptoms

Dental professionals may be the first health-care providers to suspect possible OSAS in a patient because of signs and symptoms exhibited within the oral cavity. These include: “macroglossia (Fig. 3) and enlarged pharynx, narrowed posterior airway space resulting from a long soft palate by the uvula lying below the base of the tongue; the tongue lying above the mandibular plane of occlusion and small mandible.”

Signs and symptoms of OSAS while sleeping can include drooling, xerostomia, restlessness, bruxism, choking or gasping, snoring, breathing pauses and diaphoresis. But an individual’s symptoms associated with OSAS are not limited to sleeping problems. During waking hours the patient may experience depression, difficulty concentrating, fatigue and insomnia. Other signs can include gastroesophageal reflux disease (GERD), irritability and sleepiness throughout the day. Coughlin says, “If OSAS continues to be untreated or it is never diagnosed, the sleeping disorder may elevate blood pressure and the potential for mortality increases.”
C.E. article: sleep apnea

What to look for

Maglioca says, “The population with OSAS is a heterogeneous group, and have a wide range of physical attributes. Not all patients with OSAS have all of these physical features.”7 The most common orofacial characteristics encountered include a retrognathic mandible, narrow palate, large neck circumference, long soft palate (which leads to dentists being unable to visualize the entire length of the uvula when the patient’s mouth is open wide), tonsillar hypertrophy, deviated nasal septum and relative macroglossia.

Potential outcomes of non-treatment

Patients with OSAS have interrupted sleep patterns because the obstruction of airflow causes prolonged interruptions in their breathing while they sleep (up to 40 seconds). Because the condition can lead to a reduction of oxygen in the blood stream, a host of medical complications can occur. Individuals with obstructive sleep apnea can experience worsening snoring, which is caused by vibration of the partially collapsed soft palate as air passes. Respiratory events, which deplete certain stages of non-REM and REM sleep, contribute to sleep fragmentation and unrefreshing sleep.2 Because of the lack of sleep, an OSAS sufferer may have difficulty concentrating and staying awake during the day. When sufferers sleep on their back, gravity pulls the jaw and tongue down and back. This causes the mouth to open and the tongue to drop back into the airway, narrowing the air passage.

Treatments

Oral devices and surgical intervention are the procedures used to treat OSAS. An oral appliance (Fig. 4) is a small acrylic device that fits over the upper and lower teeth or tongue (similar to an orthodontic retainer or mouth guard). This device slightly advances the lower jaw or tongue, which moves the base of the tongue forward and opens the airway. This improves breathing and reduces snoring and apnea. The appliance is fabricated and customized for each patient by a dentist experienced in the treatment of snoring and sleep apnea. The appliances are comfortable and well tolerated by patients. Appliances are easy to place and remove, easy to clean and are convenient for travel.

Non-surgical treatments are available, including positional therapy

The two main categories of oral appliances currently in use are the mandibular advancement devices (MAD) and the tongue retaining devices (TRD). The mandibular advancement devices, made of acrylic materials, are custom fabricated for each patient. The impression for the acrylic devices can be made in the dental office for lab fabrication. The devices fit comfortably over the upper and lower teeth, positioning the lower jaw slightly forward, advancing the tongue and soft tissues of the throat to open the airway. Some of the “repositioners are designed to hold the mandible anteriorinferiorly, constructed to position the mandible at 75 percent of the maximal mandibular advancement and within a 7 mm opening between upper and lower incisors”8 with no adverse effects to the temporal mandibular joint.

The MADs have an adjustment mechanism built into the device, enabling users to gradually change the position of the bottom jaw under dental supervision to improve the effectiveness of the device. Oral appliances used for OSAS patients cause a “mandibular advancement, including development of posterior open bite, altered inclination of incisors and decreased anterior open bite.”8 Through the use of various imaging techniques, research on appliances used for OSAS has identified various dental/skeletal changes that occur.

One of the most common effects, referenced in many studies, is the degree of vertical and horizontal overlap of the teeth (overjet and overbite, respectively).9 The adjustment mechanism makes it possible to position the device to best address a patient’s particular needs.

The tongue-retaining device is custom-made using a softer, pliable material with a compartment that fits around the tongue to hold it forward by means of suction. This device is used most for patients with dentures or patients who cannot adequately advance their lower jaw. Such patients must be able to breathe well through their nose, or they may have difficulty tolerating this appliance.
There are other recommended treatments, some involving behavioral therapy, that patients may be less likely to comply with, such as "non-supine sleep, [avoiding] late evening [food] consumption, weight loss, abstaining from drinking alcoholic beverages and a lifetime of required nightly use of continuous compressed air delivered by a CPAP (continuous positive airway pressure) machine via a nasal mask". The CPAP machines work when there is a compliant patient. If the patient is not compliant, there are other oral-appliance therapies that may be used, but CPAP remains the "gold standard" treatment for sleep apnea and the objective success rate of any other treatment must be judged against it. If a patient chooses oral devices over a CPAP machine, the dental team may be responsible for the fabrication of the oral devices.

**Surgical treatments**

Surgery is usually done in severe cases of OSAS or as an alternate or last-resort procedure. The main surgical treatments offered for OSAS often target the anatomical areas of the posterior airway where collapse is suspected to occur. Treatment is designed to enlarge the posterior airway space, reduce airway collapsibility and, ideally, stabilize the airway for the long term. Surgery has the advantage of correcting any craniofacial abnormalities that may be the cause of the OSAS and of removing the variable of patient compliance that is required with other long-term treatment strategies.

Obstructive sleep apnea syndrome sometimes occurs in patients with a retrognathic positioning of the mandible (Fig. 6). People who have a receding chin related to a small lower jaw are more likely to snore because there is less room in the back of the throat for the soft tissues and tongue. This reduction in space decreases the size of the air passage and causes increased snoring.

Some patients undergo "maxilla-mandibular advancement surgery." Oral and maxillofacial surgeons engaging in corrective surgery communicate with the general dentist, because whenever an OSAS patient undergoes surgery, treatment plans need to be suspended in anticipation of changes to the patient’s occlusion. Hoffstein says, "Maxilla-mandibular advancement (MMA) surgery, which is based on traditional orthognathic surgery techniques, has been proven effective for a range of OSAS disease." Surgery allows the repositioning of the tongue. Additionally, de Almeida says, "These bone movements pull the base of the tongue forward and upward, thereby enlarging the posterior airway space, creating more anterior space for the tongue. The bony segments are fixed rigidly with screws and plates to assist in healing and to resist the pull of soft tissue that may cause skeletal relapse."

**Dental team’s role in identifying sleep apnea**

Obstructive sleep apnea requires appropriate diagnosis and treatment. Interdisciplinary communication is paramount when cases are handled by a team methodology. The dentist should work closely with other health-care professionals. Referral of patients to a physician indicates the dentist’s desire to make certain that the patient receives the best care possible. Dental professionals are crucial advocates involved in the management of OSAS and should be aware of the complications that can be caused by the disorder.

Asking questions about patients' sleep habits can stimulate awareness for the general dentists and hygienist, enabling them to refer a patient to a physician who specializes in sleep disorders. Use of a standardized questionnaire similar to a medical history will ensure that every patient is screened for OSAS (see example in appendix). Identifying the underlying causes of OSAS and recommending an appropriate course of treatment can help patients maintain quality of life and reduce morbidity rates. Prinsell says, "This should be a working relationship between the medical community."

**Teamwork between dental and medical professions**

Patients with OSAS have a higher risk for hypertension, which can lead to other physical complications. Dental professionals working with physicians should be familiar with the medications and appliances used for sleep apnea and the oral compli-
Treatment for sleep apnea and snoring can help patients get the rest they need to reduce the medical complications and improve their function during the day. The dental team will be involved in monitoring any occlusal changes that result from mouth devices used in the sleep-disorder therapy.

When working with patients who have been prescribed an oral appliance, the dental hygienist needs to recommend mandatory dental visits as part of the treatment plan to keep a record of changes that might occur in the occlusal bite or to stay ahead of other dental problems that can occur because of use of the appliance. Magliocca and Helman say, “In addition to the patient’s medical history, the dentist’s clinical examination findings influence treatment planning.”

It is also important to be aware that patients may be taking medication that creates xerostomic effects. Kalan and Kenyon say, “There are, also, certain types of CPAP delivery that may add to the patient’s complaints of xerostomia.” Medications may sometimes be used to treat depression experienced by some patients with OSAS. These medications may contribute to causing the oral cavity to be dry. Patients also might begin to neglect daily oral hygiene. Dentists and hygienists should recommend and prescribe artificial saliva products and regular fluoride applications for patients with xerostomia who are using the CPAP devices. While the incidence of caries has not been reviewed in the OSAS population, it would seem especially prudent to educate patients with xerostomia about avoiding cariogenic foods and beverages.

Dental professionals need to be aware of the impact certain surgery procedures within the oral cavity can have on patients who are using a CPAP machine. For example, Kapur says, “Reflecting a mucoperiosteal flap to accomplish surgical extractions or other procedures may preclude the patient from using CPAP for one to two evenings to avoid the possible risk of developing subcutaneous emphysema.”

Because occlusal changes can occur with OSAS therapy, communication between the patient, dentist, hygienist, and the physician who prescribed the oral appliance is essential. Some patients may not notice or may not be affected by changes in their occlusion while using an oral appliance, but problems may still exist. Robertson et al. suggest “keeping the patient’s bite opening to a minimum when fabricating an appliance to reduce the impact on the occlusion.” When restorative work is be done on OSAS patients, such as crowns or fillings, adjustments to the existing appliance—or fitting of a new appliance—may be needed. The process of adjusting or creating a new appliance needs to be done with the oral surgeon or physician who prescribed the oral device.

The prevalence of OSAS may be higher than estimated, and medical and dental health-care professionals can “offer these patients the full range of available treatment options to defeat this often fatal illness.” Adding sleep-related questions to the written or oral medical history and consideration of both orofacial and physical findings may result in the detection of a sleep disorder. Dental hygienists can ask questions, such as: “How many pillows do you sleep with? Does your spouse complain that you snore? Are you grinding or clenching? Do you wake up with headaches in the morning? Do you wake up with a dry mouth?” The routine oral assessment that hygienists provide can aide in recognizing conditions pertaining to OSAS. Hygienists can facilitate the management of the patient with sleep apnea by recommending oral care products to reduce xerostomia and to reduce inflammation of gingiva for sleep apnea patients who snore. Dental health-care professionals should refer patients to physicians who manage OSAS patients on a regular basis.

Dental hygienists see patients frequently and often on a routine bases, so they are often the first to observe variations in the oral cavity. Cooperation between hygienists and dentists and medical health-care professionals who treat patients with OSAS creates an advantage to the patient for overall health care.

Treatment plans for patients with sleep apnea and sleep disorders, along with the associated medications being used by such patients, should be included in the medical history in the patient’s charts. This will ensure the dental team is aware of any changes in the oral cavity and is monitoring for potential conditions associated with medications being used to treat sleep disorders._
Appendix

Patients answering yes to any of the following questions may need to be referred to a sleep physician.

- Do you snore?
- Have you ever been diagnosed with high blood pressure?
- Has there been any witnessed stopping of breathing or gasping for breath during sleep?
- Do you know your neck size? If so, is it more than 17 inches for men or 15 inches for women?
- Have you ever been told to use a CPAP or breathing machine while sleeping?
- Do you and your partner sleep in separate rooms because of your loud snoring?
- Do you doze off unintentionally during the day?
- Do you often wake up feeling tired or having a headache?
- Do you have problems concentrating for long periods of time?

References

It was believed in the early 17th century that mineral water found in natural springs had curative powers and that drinking it would lead to good health. Early scientists soon discovered that the bubbles or carbon dioxide in this healing water was the purported cure.

The soft-drink manufacturers soon began to manufacture beverages called soda, pop or coke with flavors and carbonation in the same assumption that by drinking this bubbly natural water or carbonated beverage, the person would enjoy great health. Because drinking either natural or artificial water was considered a healthy practice, where did we go wrong?

Let’s examine a few questions regarding carbonated beverages and the acid erosion dilemma that we see today in our dental practices.

How did carbonated beverages go from a healthy drink to an unhealthy drink? Is it possible that our patients can be suffering from soda sensitivity because of acid erosion caused by the ingredients in these beverages?

This might be a question we need to ask during the assessment phase of our patients’ initial dental visits. With the staggering statistics and data compiled in the last 10 years regarding our consumption of soda, the assessment of our patients for the drinks they consume should perhaps be a standard question on the dental patient assessment form.

The commercial sale of soft drinks has increased by 56 percent over the last 10 years and is estimated to keep rising at about 2 to 3 percent a year. According to current research, acidic beverages are thought to increase the potential for dental erosion, which is defined as the chemical removal of mineral from the tooth structure. Erosion is typically progressive and results in the wearing away of the exposed tooth surface.

The question then remains, should we be assessing our patients for soda sensitivity and soda consumption during their initial dental visit? Is it possible that our patients can be suffering from enamel erosion leading to dentinal or enamel sensitivity?

With different names for carbonated beverages, are the ingredients the same?

Historically, the word “soda” refers to the beverages produced by dissolving carbon dioxide gas in plain water and has been around since the 18th century. The term “pop” was introduced in 1812 as manufacturers added nectar to soda water. In 1890, entrepreneurs developed alternative drinks based on cola and sarsaparilla extracts with carbonation. Because these drinks were believed to have medicinal properties, “soft drinks” exploded onto the market with many different flavors, including lime, lemon, orange and many variations.

Today we know these beverages with a wide variety of names, all of which are considered carbonated beverages. The ingredients in these beverages in-
Building Bridges Through Innovation, Technology, Wellness, and Inspiration

- RDH @ YDC
- Team Development Day: Ethical Dilemmas
- Healthy Living Pavilion
- Dental Management of Sleep Apnea Fast Track
- Dentaltown

LOOK WHO’S SPEAKING AT YANKEE!

The Madow Brothers
BACK BY POPULAR DEMAND!
The Rock and Roll Dentists
Straight from Las Vegas

Robert Spector
AUTHOR OF NEWLY RELEASED
The Nordstrom Way to Customer Service Excellence

Gordon Christensen, DDS
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ENDODONTICS

Loretta LaRoche
PERSONAL DEVELOPMENT

Laney Kay, JD
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Soda pop was originally expected to be good for a person. That perception has changed over time. (Photo/Provided by www.sxu.hu)

potentially cause dentinal hypersensitivity because of dental erosion.

**How can soda lead to dentinal sensitivity?**

The exposure and bathing of the tooth to acid over a long period can cause a progressive loss of enamel and eventually dentin. If the patient has exposed dentin at the cervical third of the tooth, this added acid process could quickly cause dentinal hypersensitivity.

Drinking a low pH beverage can lead to sensitivity in two ways. First, the lower pH of the beverages can keep the patient's mouth in a constant acidic state, increasing the risk for dentinal hypersensitivity. Second, beverages are usually consumed cold or with ice, which also can cause the patient to experience signs and symptoms of sensitivity.

Typically, dentin will have a smear layer or microcrystalline and organic debris that is found on the root after instrumentation, brushing or due to the formation of acquired pellicle. When the acid from beverages is constantly surrounding the tooth, this smear layer is removed, which opens the dentinal tubules, thus allowing fluid to flow in and out toward the pulp and resulting is discomfort and pain. This process is known as the Hydrodynamic Theory.

This theory suggests that stimuli move fluid in or out of the dentin, and that this fluid activates interdental or pulpal nerves to cause pain. When the tooth does not have a smear layer to cover the dentinal tubules, this fluid can move freely. The migration of gingival tissue due to gingivitis and or periodontal disease can also cause the root to be exposed to the fluids we drink daily.

True dentinal sensitivity is multifactorial. The constant acid environment is just one of these factors. In essence, there is not a true sensitivity caused by just soda. However, we can rule out the possibility of the patient’s diet having an over-abundant amount of acid-containing soda in his or her diet during our initial assessment phase.

**How can we assess the patient for soda consumption and dentinal sensitivity?**

As with all assessment strategies in dentistry, we must first ask each patient the important questions regarding the consumption of soda and other acidic beverages. It is important that they understand what this means and which beverages might be acidic. By providing patients with a visual chart of common popular drinks, we can help them understand how these drinks can be the cause of sensitivity. A laminated beverage chart is a clearly understood and convenient source of information about these beverages.

Many patients are not aware of the connection between these popular beverages and how the pH

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With many different beverages on the market, what is the difference between the pH of these beverages?

The pH of a beverage will range from a pH of 0, which is very acidic, to a pH of 14, which is very basic. A pH of 7 is our typical value for neutral. The pH of water is around 7, while the average soda pH is around 3 and sometimes less. Most carbonated beverages have a pH of 2.5 with the diet colas on average around 3.3.

Studies done on acidic foods and beverages as risk factors for enamel erosion reported that most acidic beverages at a pH level of 4.2 is minimal, but became more evident as the pH was lowered. This low pH solution bathes the tooth continually and can
is an important factor with regard to dentinal hypersensitivity. A thorough questionnaire or dietary analysis will flush out the potential for sensitivity caused by acid erosion and the overconsumption of acid-containing beverages.

Acid erosion can also be caused by medical conditions such as gastroesophageal reflux disease, also known as GERD. However, this condition would cause erosion on the lingual surfaces of the teeth due to the low pH of gastric juices regurgitated into the oral cavity and not the erosion that would be consistent with soda, which is equally distributed throughout the oral cavity.

A bulimic patient would also show erosion on the lingual surfaces of the teeth for the same reason as seen with GERD.

Another assessment strategy is the visual clinical exam. The patient should be evaluated for all types of sensitivity, including localized, generalized, periodontal, tooth decay, fractures, abscesses, coronal and dentinal sensitivity. By providing a typical clinical assessment, the dental clinician should be able to identify which type of sensitivity the patient might be suffering from.

What strategies can be implemented to reduce acid erosion and help to neutralize soda acid?

There are many strategies to help neutralize the acid in the patient’s mouth due to acid from the soda they drink. Once we have educated the patient on the acid content of soda and the destruction it can cause the enamel and dentin of all tooth surfaces, at-home strategies followed by chairside strategies can be implemented. This is the continuum of care for tooth sensitivity.

*What is the first line of treatment in the continuum of care for tooth sensitivity?*

First, instruct the patient to consume acidic drinks quickly and not to hold them in the mouth for an extended period of time. Using a drinking straw will keep the acid away from the tooth surface and lowers the time the acid beverage is on the tooth.

Instruct the patient to avoid brushing immediately after consuming acidic drinks, allowing a smear layer to accumulate on the tooth. Although it is logical to encourage tooth brushing immediately after consumption of sugared acidic beverages, research suggests that brushing enamel immediately after exposure to acidic beverages increases tooth loss.

Next, recommend brushing twice a day with a desensitizing toothpaste such as Sensodyne® as part of the at-home management of tooth sensitivity. The active ingredient, potassium nitrate, desensitizes the nerve endings responsible for the sensitivity. This creates a barrier around the tooth protecting the patient from generalized sensitivity. Sensodyne purchased over the counter (OTC) could be a suggested first line of care delivered at home twice a day.

*What is the second line of treatment in the continuum of care for tooth sensitivity?*

When the first line of treatment is not enough to relieve dentinal hypersensitivity, a dental office...
application of NUPRO® Sensodyne prophylactic paste, applied during a professional prophylaxis, is a chairside strategy that can be utilized for immediate relief. This prophylactic paste active ingredient is NovaMin®, which reacts with saliva to raise the pH. With elevated pH, calcium and phosphate precipitates as calcium phosphate and crystallizes to build a new hydroxyapatite-like layer over exposed dentinal tubules. The patient gets a stronger, more acid-resistant protective layer to protect his or her teeth.

After completion of the professional prophylaxis, the patient can be given Sensodyne NUPRO® Professional toothpaste. This paste delivers a combination of 5 percent NovaMin® and 5,000 ppm of fluoride for daily use. This toothpaste combines fluoride for enamel and dentin remineralization and NovaMin®, a patented technology for sensitivity protection.

As our patients’ soft-drink consumption continues to increase, dental professionals need to be prepared to assess, educate and apply therapies for dentinal sensitivity treatment. By implementing a continuum of care, which includes take-home strategies and chairside therapies, the patient and the dental professional can work together as a team to resolve dentinal sensitivity caused by the overconsumption of our patients’ favorite drinks.

References

Doreen Johnson, RDH, Med., is a clinical educator for DENTSPLY Professional, covering the Midwest region of the United States. She came to DENTSPLY with 21 years of clinical expertise and 10 years of experience as a dental hygiene educator. She is a graduate of the University of Pittsburgh School of Dental Medicine, holding certification as a dental assistant and a registered dental hygienist. She received her bachelor’s degree from Edinboro University in education, and a master’s degree from National Louis University in adult education. She also serves as an active dental hygiene consulting examiner for the North East Regional Board of Dental Examiners. Johnson has developed educational programs and presented them to dental and dental hygiene students, professional associations, dental societies, and study clubs both nationally and internationally. Her goal is to provide dental professionals with current scientific research and information to assist them in implementing effective and efficient evidence-based treatment protocols in their clinical practices. You may contact her at doreen.johnson@dentsply.com.
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From a clinician’s perspective, the innovative Tap-On Technology is designed to reduce leg and ankle discomfort associated with continued foot pedal usage.¹ With just one quick tap on the foot pedal, the unit activates and remains active until the foot pedal is tapped a second time. As a result, the clinician’s foot remains in a neutral, relaxed position during the scaling procedure. No longer does the clinician need to keep a foot on the foot pedal when scaling.

The new Prophy Mode Auto Cycles on the Cavitron JET Plus system automatically cycle between air polishing and rinse, eliminating the need to constantly touch the pedal to change from water spray to the air/water/powder slurry. Clinicians can easily select the prophy cycles time they prefer: none, short, medium or long. This feature allows the clinician to individualize each patient’s treatment based on the level of deposit to be removed.

Many clinicians prefer air polishing because it is less abrasive to enamel than traditional prophy paste.¹ The new Tap-On Technology and Prophy Mode Auto Cycles are designed to improve efficiency and reduce hygienist leg strain.¹ The clinician no longer needs to keep a foot on the foot pedal when air polishing.

Improvements also have been made to the water control features on the unit. The new, finer, water control allows for more precise adjustment of the water flow. This aids the clinician in establishing optimum water flow and water spray patterns for each individual patient, contributing the unique ultrasonic benefits of cavitation and acoustic microstreaming.

The convenient location of the water control on the base of the handpiece allows the clinician to easily adjust the water without turning away from the patient. Using the numbers on the handpiece, the clinician can easily adjust the water control to his or her preferred setting.

An additional “Turbo” power option offers 25 percent more clinical power than normal power mode.¹ To activate this mode, the clinician simply presses a button on the control panel. Additionally, hands-free activation of the boost mode is available...
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by simply pressing the foot pedal to the floor. Boost mode provides up to a 25 percent increase in power and allows the clinician to easily and efficiently move from lower power settings, traditionally used for biofilm and light deposit removal, to higher power settings for removal of more tenacious, larger deposits.

Boost mode is designed as a short power boost, while the new Turbo mode is designed for occasions that require a sustained power increase.

Additional features of the units include an autoclavable handpiece, Cavitron’s patented BlueZone™ technology and convenient single-push purge mode.

The purge feature is a self-timed, two-minute water purge, easily activated by pressing the button on the front of the unit. This feature saves time for the clinician by eliminating the need to press on the foot pedal for two minutes to purge the water line.

The handpiece is easily removed for easy sterilization, allowing for increased infection control during clinical procedures by reducing the risk of cross contamination. BlueZone technology provides an extended low power range for improved patient comfort when subgingivally scaling.

All of these enhanced features are neatly packaged into a unit with a new look that has clean lines and more intuitive interface designs. The illuminated diagnostic display is designed to be easy for the clinician to read and navigate. A smooth, clean, front surface design is esthetically pleasing and easy to maintain.

The new, innovative technologies incorporated into the Cavitron Plus and Cavitron JET Plus with Tap-On Technology, and their associated advantages, provide the clinician with enhanced and improved options for ultrasonic instrumentation.

Reference


About the author

Gail Malone, RDH, BS, is a clinical educator for DENTSPLY Professional, serving the northeast region of the United States. She received her dental hygiene degree from Montgomery County Community College in Blue Bell, Pa., and received a bachelor’s degree in dental hygiene from Thomas Jefferson University in Philadelphia, where she also served as adjunct faculty. Malone’s more than 20 years in dentistry includes experience in clinical practice, dental hygiene education, dental practice management and dental distribution. She has lectured internationally, nationally and at the state and local level on ultrasonics, local anesthesia and a variety of other topics. Her aim is to provide dental professionals with current scientific research and information to assist them in implementing effective and efficient evidence-based treatment protocols in their clinical practices. You may contact her at gail.malone@dentsply.com.
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Group Editor Robin Goodman r.goodman@dental-tribune.com

Hygiene Managing Editor Robert Selleck r.selleck@dental-tribune.com

Managing Editor Sierra Rendon s.rendon@dental-tribune.com
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