

FLOOD CONTROL

Moisture is generally not a dentist's friend — and this is especially true during oral surgery. *Mentor* examines the various methods clinicians use to manage excess blood and saliva during dental procedures

By Rebecca Stone

Most sales pros are familiar with the fact that many of today's dental materials just don't mix well with moisture. This is the ultimate irony, as a healthy oral cavity is, by nature, moist. Yet saliva, the beneficial fluid that bathes, protects and nurtures the oral cavity, and blood, a normal byproduct of dental therapies, can cause treatments to fail due to materials that are incompatible with moisture. Further, these fluids may also obscure the field of operation and, if sprayed or spattered, pose cross-contamination risks.

If left unchecked, these problems can take a serious bite out of office efficiency — not to mention safety — and can jeopardize a wide range of dental procedures. For instance, David Hornbrook, DDS, FAACD, a cosmetic and restorative practitioner in La Mesa, California, and an international lecturer on esthetic and restorative dentistry, explains that for restorative dentists, the biggest challenges can come when isolating for an adhesively bonded restoration.





Point of Sale <

MOISTURE MANAGEMENT

- Moisture-control products can boost office efficiency by speeding procedures and helping to improve outcomes.
- Absorbent materials such as cotton rolls are easy to use, help provide retraction and comfort, and are often employed in conjunction with other methods.
- High-volume evacuators can quickly clear an area by suctioning both fluid and debris, while providing retraction of the tongue and cheeks. Newer devices may also help with illumination.
- Dental dams isolate the field of operation, protecting it from contamination from moisture and debris, aiding visibility, enhancing infection control, and protecting the patient from swallowing or inhaling debris.
- Some local anesthetics contain vasoconstrictors, which help reduce bleeding, while topical anesthetics may also contain hemostatic agents.
- Studies show that in comparison to a blade, the use of a laser for oral surgery is practically bloodless, enhancing moisture-control efforts.

"This is especially true," he says, "when using a total-etch technique, where any saliva contamination can lead to microleakage and post-operative sensitivity. And the degree of difficulty and importance is that much greater when treating a second molar, especially one with pre-existing subgingival margins, where saliva control as well as hemostasis and sulcular fluid control come into play."

It is in oral surgery (involving the cutting of soft tissue), however, that moisture management can be particularly challenging. But in such scenarios, moisture control can be a double-edged sword. "Any time the tissues dry, that causes cells to die," notes Peter Nordland, DMD, whose Nordland Oral Microsurgical Institute is based in La Jolla, California. "Cells dying on a wound margin can lead to scar formation and slowed healing," he explains, adding that to address this problem, an idea is being floated among a small group of oral surgeons to perform oral surgery with a layer of water covering the surgical site, although how this would be accomplished on living patients remains to be seen. "It's tricky," he admits. "But that idea has been proposed."

For the time being, though, Nordland says that one of the primary ways in which he deals with bleeding is to head it off at the pass by instructing his patients to forego taking aspirin, fat-soluble vitamins and fish oils a week before a procedure. In the case of patients who take blood thinners, he works with their physicians to moderate dosages prior to oral surgery.

But given that the oral cavity is a virtual minefield of salivary glands, you would think clinicians are fighting a losing battle. Fortunately, there are scores of tried-and-true methods — as well as some newer strategies — for managing moisture during oral surgery and other

kinds of dental procedures. Sales reps who would like to keep their clients — and patients — from drowning should be familiar with the various techniques.

ALL HANDS ON DECK

There are several methods of moisture control that can be used in operative dentistry and oral surgery. Dental dams serve to isolate teeth during restorative procedures, but they are not as widely used as the various types of absorbent materials that are now available. These include gauze and dry angles (triangular absorbent pads that block salivary flow from the parotid gland). Additionally, cotton rolls, available for use with cotton roll holders, help to enhance patient comfort and provide a degree of isolation, as well as tongue and cheek retraction. Formerly made of cotton, these products are now made of new synthetic materials, which allows them to be much more absorbent without shedding or tearing.

Many of these procedural adjuncts can be used to control both saliva and blood. Michael Sonick, DMD, who operates a practice specializing in implants and periodontics in Fairfield, Connecticut, reports, "The most frequently used method of hemostasis is pressure. This is usually performed by moistening a piece of gauze and holding it on top of the area of bleeding for two to five minutes."

Nordland is a fan of using dry angles, which also help with retraction. "When I'm placing implants, I'll want to have a nice sterile field — and if the implant is bathed in saliva, it's going to be contaminated," he says. "You certainly don't want a sterile implant to be contaminated on its way into the prepped hole in the jawbone."

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Other products are designed specifically for hemostasis. In fact, according to Hornbrook, moisture control and hemostasis are really two separate issues. "Hemostasis," he says, "should include sulcular fluid control, since both of these are imperative in capturing accurate impressions for indirect dentistry and for cementation of any type of restoration. Traditional retraction cord, the use of lasers and electrosurgery, and putty retraction pastes and gels are all effective in managing this problem."

Sonick stresses the importance of hemostasis, especially at the conclusion of a surgical procedure. "In the case of gingival grafting, bleeding could cause the graft to lift off the surface of the tooth, leading to a 'dead space' and loss of the graft," notes Sonick. "It is also important to control bleeding before a patient leaves the operatory so that he or she will have a comfortable post-operative experience."

SUCTION, PLEASE

As effective as moisture-control and hemostatic products are, they do not prevent contamination or debris from accumulating. And while saliva ejectors are certainly familiar clinical fixtures, when it comes to more invasive procedures such as soft-tissue surgery, it's time to haul out the big guns. High-volume evacuators (HVE) are vacuum systems that allow faster and more powerful suction than ejectors. Capable of removing solid debris, they are typically preferred for use in conjunction with high-speed handpieces, which require a cooling spray and a way to contain aerosolized bacteria. Often featuring surgical suction tips made of stainless steel, they can also double as retraction aids.

David Hornbrook, DDS, FAACD, an international lecturer on esthetic and restorative dentistry who operates a cosmetic and restorative practice in La Mesa, California, explains that new devices are now available that remove excess saliva, while at the same time retracting the tongue and acting as a bite block to hold the arches apart. "These are all excellent when a rubber dam can't be used," he observes.

Some HVE devices also offer illumination via reflective surfaces. While clinicians operating with magnification having its own light source may not find the reflective properties that beneficial, these systems are reportedly helpful for those operating without dental assistants.



JUST SAY YES

Chemical agents provide yet another means of moisture control. Local anesthetics are often laced with a vasoconstrictor, such as epinephrine. When injected into the soft tissue, it constricts blood vessels, which reduces bleeding. Nordland, like other clinicians, often uses an anesthetic with epinephrine for added hemostasis, especially in tissue surgery. But he points out that in addition, he typically sedates his patients, and says that the narcotics themselves have a drying effect.

Other agents used in hemostasis include topical solutions, such as those containing sodium hypochlorite, ferric sulfate or aluminum chloride, and hemostatic astringent agents, such as racemic epinephrine, aluminum potassium sulfate and aluminum sulfate. These are available in gel or paste forms and in impregnated retraction cord. It has also been found that a bleaching agent containing 30% hydrogen peroxide quickly helps eliminate bleeding when applied to soft tissues. Sonick says that one of his favorite hemostatic agents is a ferric sulfate product. "The results are immediate upon application to the site, and it is very easy to use, whether during impression-taking, dental and implant surgeries, tissue grafts or other applications," he tells *Mentor*.

Sonick notes that in addition, agents such as hemostatic collagen, gelatin, bone wax and cellulose are frequently used at the end of surgery for hemostasis. "They are usually placed at the site of bleeding and serve as a nidus for initial clotting," he says.

Nordland points out that impregnated retraction cord acts like an astringent to stop bleeding, but he cautions that it can also injure tissue, causing it to recede. "Any time we're treating the tissue with a chemical that causes the blood vessels to close down," he notes, "there's a risk this will be traumatic to the tissue."

In contrast, Hornbrook reports there are several new kaolin clay putty retraction pastes that are atraumatic and easily used as retraction mediums. "The aluminum chloride in these pastes provides hemostasis, while the clay-based putty expands into the sulcus, retracting the tissue," he explains. "They can be used prior to taking vinyl or digital impressions, or prior to cementation."

CUTTING INSTRUMENTS

Studies and collective experience show that the type of cutting instrument used influences the amount of bleeding that occurs during a procedure. For this reason, many clinicians who perform oral surgery advocate the use of lasers or electrosurgical units over blades as a way to control bleeding. "Surgical blades result in the most bleeding," explains Sonick. "Electrosurgical units and lasers cause coagulation as they cut, leading to little or no bleeding."

In Hornbrook's estimation, the laser is the most effective cutting instrument in this respect. "The use of a surgical blade causes the most bleeding because it provides no hemostasis," he notes. "The electrosurgical unit will

help with retraction and hemostasis, but since it provides this by heating and cauterizing the tissue, healing is not as predictable as when a laser is used. This can be a huge concern in the esthetic zone where isolation, hemostasis and retraction are desired."

A diode laser, Nd:Yag laser and CO₂ laser, designed to cut soft tissue, are reported to cause the least bleeding while offering razor-sharp precision. In fact, it is said that soft-tissue lasers cut and seal at the same time. This is particularly true in the case of the diode laser, which is said to lay down a layer of carbon upon hitting tissue, which serves as a sort of surgical dressing to maintain sterility and promote healing.¹

"The diode laser provides excellent retraction and hemostasis," says Hornbrook, who notes the once prohibitively expensive devices have now come down in price, making them reasonable alternatives to electrosurgical units. "In my opinion," he adds, "the diode laser is a must-have in every dental practice."

Nonetheless, Nordland prefers a blade, saying, "A laser cauterizes as it burns away tissue, and that's a benefit. I will use a laser on occasion, but it's not my go-to instrument with every surgery. I'll use microsurgical blades to keep the incision as small as possible. In my experience, if incisions are less traumatic, patients experience less bleeding and faster healing. I have used electrosurgical units and they work nicely — but I use those devices and lasers more for fine tuning."

LEXICON

Bone Wax: A waxy substance placed on bone surfaces to control bleeding

Hemostasis: Cessation of bleeding

Kaolin Clay: A soft, white clay used in making porcelain

Parotid Glands: The largest of the three major salivary gland pairs, located in the cheeks

Subgingival: Area beneath the gumline

Sulcular Fluid: That which derives from the sulcus; also known as gingival or crevicular fluid

There's no doubt that challenges in moisture management remain — but the innovations are sure to keep coming. And with the variety of strategies available, salespeople have their hands full in not only keeping up with developments, but also in determining each client's preferred approach. By doing that, account reps can help clinicians keep the flood under control amidst a rising sea of product change. 🌀

REFERENCE

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(men'•tôr) *n.* personal advisor highly regarded for knowledge



Today's Buzz

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GIVE A DAM

Isolation is another method of managing moisture and controlling the field of operation. There are numerous advantages to isolation: It keeps the treatment area clean and dry, which offers improved access and visibility and lessens the possibility of errors stemming from technique sensitivity.

Though not practical in soft-tissue oral surgical procedures, the rubber or dental dam is the quintessential isolation device. “For saliva control and isolation, nothing is superior to the use of a rubber dam. It provides incomparable isolation and visualization,” notes David Hornbrook, DDS, FAACD, a cosmetic and restorative practitioner in La Mesa, California, who lectures internationally on esthetic and restorative dentistry. “Unfortunately, many clinicians do not know how to use a rubber dam correctly or efficiently, or feel it’s too much trouble for the value it offers. I am certain that most of us who routinely use dams would disagree.”

The components of dam systems typically include rubber, latex or nonlatex sheets of various gauges; a holder or frame (U-shaped or another type of metal or plastic frame on which the dam is stretched for stability); a punch, used to create holes for individual teeth; clamps (metal pieces that are designed to fit around the cervical areas of teeth, securing the dam around them); forceps (used to place and remove clamps); and a napkin (placed between the patient’s face and the dam for protection and to absorb moisture).

By ensuring a dry, clean field through isolation, dams enhance uptake of formulations such as fluoride by allowing teeth to slightly dehydrate. They also protect soft tissue and improve visibility due to the fact that they are usually dark in color, creating contrast against the tooth. Dams are used faithfully by some practitioners and eschewed by others. Yet, not only do dams prevent patients from tasting dental materials, even more important, dams protect other oral structures from injury and prevent patients from aspirating or swallowing errant materials. Patients will appreciate the fact that dams now come scented and in flavors. Ultimately, the use of dams not only enhances the safety of both patients and clinicians, it also increases efficiency in that patients don’t constantly have to rinse and spit debris.

WATERWORLD

Why is it such a challenge to exert control over moisture in the oral cavity? It’s because the oral environment is lined with mucosal tissues that secrete moisture. Three pairs of major salivary glands — the parotid, submandibular and sublingual — produce the lion’s share of salivary output. Smaller amounts are secreted by minor salivary glands, including lingual, labial, buccal, palatal and glossopalatine.

Another type of oral moisture derives from sulcular fluid (also known as gingival or crevicular fluid). This clear, antimicrobial liquid is produced by the epithelium of the gingival crevice and is rich in plasma proteins. Said to carry antibodies between connective tissue and the sulcus, an increasing presence of sulcular fluid is associated with gingival inflammation.

And, of course, any time clinicians are operating on tissues, bleeding is to be expected. Thus, when discussing moisture control with your customers, you’re not only talking about preventing saliva and sulcular fluid — and let’s not forget respiratory moisture and handpiece spray — you should also suggest hemostatic techniques. After all, clinicians need a clean, dry field to maintain a clear view and to prevent moisture from interfering with the successful use of materials.

HYDROPHILIC OR HYDROPHOBIC?

Some strategies for avoiding moisture-related issues, simply come down to product choice. Dental materials — such as those used in restorations, preventive treatments and impressions — tend to fall into one of two camps: hydrophobic or hydrophilic. Many newer materials are being designed with hydrophilic (i.e., water-friendly) properties. This means they are attracted to moisture, even chasing it into nooks and crannies. Although there may still be the issue of visibility, such materials can be worked successfully in the oral environment, relieving clinicians of the effort to maintain a desert-dry oral environment.

On the other hand, hydrophobic materials are, basically, incompatible with the oral environment and will be negatively affected by fluid contamination. Such materials necessitate the creation and maintenance of a dry field of operation. In such cases, the use of products dedicated to moisture control is of utmost importance.