What do Batman and orthodontic braces have in common?

By Shirley Gudzowki, RDH, BSDH, FADSH

The most stomach-wrenching thing dentists see is an oral cancer lesion; for hygienists, it’s the melted enamel under and around orthodontic brackets and bands. The hot pink tissue seems to pulse with a life of its own. It covers the gingival third of the tooth hiding a caustic biofilm that percolates acids reminiscent of the vats Batman hung over, strung up by the Dark Knight’s chemistry under there has baffled third year dental and dental hygiene students. What to do with melted enamel?

**Solutions: appliances and chemical ones**

One option is to use the more advanced appliances that discourage biofilm accumulation. The idea of ‘living better though chemistry’ is another answer to this problem. Today’s oral care products, over the counter and professional, have the potential to eliminate that stomach-wrenching moment. Even without relying on patient compliance, change can occur to save the teeth.

**Brackets** New passive self-ligating brackets are a great way to go (Damon). They discourage biofilm formation. The design of the bracket allows the low-force memory wire to move the teeth with less chance for bacteria to accumulate because they don’t require ligatures. Elastic ligatures greatly increase the number of microorganisms attached to the apparatus during treatment. This increased level of biofilm activity increases the incidence of decalciﬁcation during treatment.

**Fluoride** Applying ﬂuoride varnish biannually may decrease unsightly white spot infections. Some of the elastomeric ligatures come in ﬂuoride releasing types that cut down on bioﬁlm too. The ﬂuoride release is temporary, lasting only about two weeks; one study stated that they shouldn’t be counted on for decreasing enamel breakdown.

**Bonding cement** The cement for bonding the brackets onto the teeth can make a huge difference, too. An ortho cement containing amorphous calcium phosphate (ACP) (Borowski Agries) contains the components to remodel the tooth. Without relying on a teenager to remove bioﬁlm, the cement changes properties during an acid challenge to release the ACP, thus releasing the consequences of teenage hormone surges that put self-care on the back burner.

**The Agries cement** is a compliance-free way to go. The hygiene department can have more say in treatment modalities if it affects the oral hygiene of the patient. Stopping therapy by removing the brackets is not always a good option, although it should work its way to the top of the option list if by six months the patient’s oral hygiene hasn’t improved.

**Pastes** Along with the enamel replacement trend there are newer pastes that do more than just provide ﬂuoride. The list is long, starting with Colgate Total with Triclosan, and advancing to products containing Novamin and Recaldent, and the new one Tricalcium Phosphate (TCP). Having these products on hand to give orthodontic patients can set the stage for a premiere cosmetic outcome, along with a great orthodontic outcome.

**Prophy paste** Deciding on a prophy paste is also a worthwhile exercise. It seems as if new polishing pastes are brought to the market almost every day. The newest NuPro contains Novamin. New prophy cups and brushes can never resist break- apart around brackets or wires. An air slurry polisher is important to use on patients with brackets and bands. Biocarbonate has many healing properties and can reduce biofilm on its own working with the sodium pump in the cell wall of the bacteria to upset the equilibrium, thus killing the bacteria. Calcium carbonate in Prophy Pearls (KaVo) is also helpful to the tissue, although not as dramatically.

**Home care** Customizing the home care regimen is very important for people wearing orthodontic appliances. Many hygienists go to the cosmetic end and talk about halitosis or gunky food; changing from the brackets or wires, making the patient unappealing to the opposite sex. The problem is, though, the patient’s don’t respond well to this scare tactic. If they want to, they’ll find someone to get close to.

Really looking at the array of toothbrushes available for ortho patients is important. So is finding out if they’ll use a Water Pik. The beneﬁts of pulsing water for removing biofilm and creating ghost cells of the bacteria in the biofilm is substantiated in the literature. Water is the only thing necessary for outstanding results.

**Resin modiﬁed glass ionomer (RMGI)** On occasion, things get out of the clinician’s hands and enamel breaks down. Something new on the market can be used as a temporary band aid over a white spot infection that has started anywhere on the teeth. It’s a resin modiﬁed glass ionomer called Vanish XT Varnish. The dispenser is new to the hygiene world in that it uses double-barrel dispensing. Like epoxy cement, two components are squeezed out onto a mixing pad, mixed chairside and applied with a microbrush or other similar device, then the material is light cured. It is tooth colored as long as the tooth is white. It releases ﬂuoride to the area and recharges when ﬂuoride is around.

**Sociological & psychological considerations**

The sociological and psychological needs of the teenage patient also need to be addressed. Remove all judgment; the situation you are looking at with each patient is what it is. With teenage patients, it’s very tempting to belittle or use a condescending tone.

Sometimes the patient doesn’t want the treatment and will show his or her displeasure by refusing

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**Genetic discovery could lead to advances in dental treatment**

By David Stauth

**Corvallis, Ore. —** Researchers have identified the gene that ultimately controls the production of tooth enamel, a significant advance that could someday lead to the repair of damaged enamel, a new concept in cavity prevention, and restoration or even the production of replacement teeth.

The gene, called Ctip2, is a “transcription factor” that was already identified the gene that ultimately controls the production of tooth enamel,” said Christa Kioussi, an assistant professor in the College of Pharmacy at Oregon State University. “This is the first transcription factor ever found to control the formation and maturation of ameloblasts, which are the cells that secrete enamel.”

![](image)

**A normal mouse tooth on the left, where ameloblast cells that produce enamel are glowing in red. On the right is a tooth with the Ctip2 gene deleted, and little enamel has been able to form.**

This we didn’t know what regulated the production of tooth enamel,” said Christa Kioussi, an assistant professor in the College of Pharmacy at Oregon State University. “This is the first transcription factor ever found to control the formation and maturation of ameloblasts, which are the cells that secrete enamel.”
Dear Reader,

In this issue, readers will be learning about alternative treatment modalities for orthodontic patients. While these treatments may have been introduced to some practitioners, the information will be completely new to others. How is it possible that some hygienists are actually using new products for various dental hygiene applications and others have never heard of such things?

This is truly reflective of the amount of interest a clinician takes in keeping up to date with the world of dental hygiene. Many hygienists are content doing the things they always have and do not seek out new, potentially better ways to treat patients. The question I pose to hygienists is this. Do you want your physician practicing 1980s medicine or are you content doing the things they have always done and do not seek out new knowledge to allow us to practice dental hygiene the way it is meant to be practiced in 2008?

Best Regards,

Angie Stone, RDH, BS
Editor in Chief
NCOHF awards Dental Hygienists’ Toothfairy Grants

The National Children’s Oral Health Foundation (NCOHF) has awarded three Dental Hygienists’ Toothfairy Grants totaling $14,000 to organizations to help eliminate children’s suffering from preventable dental disease. Grants are made possible through contributions to the Dental Hygienists’ Toothfairy Campaign in partnership with the American Dental Hygienists’ Association.

NCOHF President and CEO Fern Ingber said, “NCOHF is very grateful to the American Dental Hygienists’ Association and all dental hygienists who have made generous contributions to the Toothfairy Campaign. Together we are focused on providing underserved children effective preventive oral health services that break the cycle of preventable pediatric dental disease.”

Dental Hygienists’ Toothfairy Grants were awarded to the following NCOHF Affiliate network organizations:

- $10,000 to Catholic Healthcare West (Chandler, Ariz.), that in collaboration with multiple community partners has expanded its new dental clinic to reduce the incidence of needless suffering through its prevention and intervention dental program.
- $2,000 to Primary Health Care, Inc. Dental Clinic (Des Moines, Iowa) for vital prevention education program materials that teach positive behaviors to prevent pediatric dental disease.
- $2,000 to A Fluoride Connection Non Profit Corporation (Madison, Wis.) for materials teaching prevention and positive behaviors that prevent needless pain caused by pediatric dental disease.

Recipients are members of NCOHF’s national affiliate network, dedicated to delivering comprehensive oral health treatment and preventative educational services to millions of economically disadvantaged children and their families.

Nancy Adriano, RDH for Primary Health Care, Inc. expressed her excitement. “The funding is very beneficial since we are currently seeing many more people who do not have the means to pay for dental care in our clinics. We are very excited to receive our educational material and begin using it with our most vulnerable children. Thank you so much for this great opportunity!”

GENETIC

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The researchers used a laboratory mouse model in this study in which this gene has been “knocked out” and its protein is missing. Such mice lack basic biological systems and cannot live after birth, but allow scientists to study what is there and what’s missing.

In this case, the mice had rudimentary teeth ready to erupt, but they lacked a proper enamel coating and never would have been functional.

“Enamel is one of the hardest coatings found in nature, it evolved to give carnivores the tough and long-lasting teeth they needed to survive,” Kioussi said.

With an understanding of its genetic underpinning, Kioussi said, it may be possible to use tooth stem cells to stimulate the growth of new enamel. Some research groups are already having success growing the inner portions of teeth in laboratory animal experiments, but those teeth lack hard coatings — the scientists lacked the genetic material that makes enamel.

“A lot of work would still be needed to bring this to human applications, but it should work,” Kioussi said. “It could be really cool, a whole new approach to dental health.”

Many people have problems with eroded tooth enamel, including people who smoke, drink and especially some who use illegal drugs such as methamphetamine. And most cavities start as a hole in tooth enamel that allows decay to begin.

This research was supported by the National Institutes of Health and the OSU College of Pharmacy. The study was a collaboration of scientists from the OSU College of Pharmacy, College of Science and College of Engineering, and the Institut de Genetique et de Biologie Moleculaire et Cellulaire in France.

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