Scientists are trying to open a new front in the battle against gum disease, the leading cause of tooth loss in adults and sometimes termed the most serious oral health problem of the 21st century. They described another treatment approach for the condition in a report today at the 244th National Meeting & Exposition of the American Chemical Society, the world’s largest scientific society.

“Our technology uses controlled-release capsules filled with a protein that would be injected in the pockets between the gums and the teeth,” said Steven Little, Ph.D., who reported on the research. “That’s ground-zero for periodontal disease ‘gum disease’ the place where bacteria breed and inflammation occurs. The capsules dissolve over time, releasing a protein that acts as a homing beacon. It guides immune cells to the diseased area, reducing inflammation, creating an environment that fights the disease process and even could create conditions favorable for gum tissue to regrow.”

Little and colleagues, who are with the University of Pittsburgh, have evidence from laboratory experiments with mice stand-ins for humans in early research of this kind that cannot be done with actual patients that the approach does foster healing and regrowth of gum tissue damaged by periodontal disease.

A bacterial infection causes periodontal disease. It first appears as mild tenderness and bleeding of the gums. It leads to inflammation and, if left untreated, can damage the gums so that they recede and lose their attachment to the teeth. It may progress even further and damage bone and other tissues that hold teeth firmly in place. Surprisingly, gum disease has a number of deleterious effects outside the mouth, with some studies linking inflammation in the gums to an increased risk of heart disease, stroke and preterm delivery in pregnant women.

Treatment includes scal-
Perio prevalence in US reported in study


Lead author Paul Eke used information from a sample of 3,742 adults 50 years and older with one or more natural teeth of the civilian non-institutionalized population. Attachment loss and probing depth were measured at six sites per tooth on all teeth (except the third molars). The study is important because it is the first national probability sample that has employed a full-mouth periodontal examination protocol versus previous partial mouth examinations.

Of the sample presented, 47.2 per cent, representing 64.7 million adults, had periodontitis distributed as 8.7 per cent, 50.0 per cent and 8.5 per cent with mild, moderate and severe periodontitis, respectively. For adults 65 years and older, 46 per cent had either moderate or severe periodontitis. These estimates are far higher than previous national estimates.

Periodontitis was highest in males, Mexican Americans, adults with less than high school education, adults below 100% Federal Poverty Levels, and current smokers. This survey has provided direct evidence for a high burden of periodontitis in the adult U.S. population, especially among adults 65 and older.

This information implies that despite America having almost twice the number of dentists per person as the rest of the world, there are still more needs to be done to improve oral care and dental education, partially within the less affluent areas of the country.

Inflammation is inherently a good thing, but too much of it is a bad thing. That’s why we aim to restore the immune balance, or homeostasis.

To reduce inflammation at the gums, Little and colleagues designed injectable controlled-release capsules containing a protein encased inside a plastic-like polymer material. The polymer is already used in medicine in dissolvable sutures. After the capsules are injected, the polymer slowly breaks down, releasing the protein encapsulated inside. The protein, termed a chemokine, is already produced by the body’s existing cells in order to summon specialised white blood cells to a specific site. Scientists previously tried to keep these cells away from the gums so as to block inflammation from occurring in the first place.

“It seems counterintuitive to lure in a lymphocyte, which is traditionally thought of as an inflammatory cell, if there’s inflammation,” Little pointed out. “But remember that a certain level of natural inflammation is required to fight off an infection. Inflammation is inherently a good thing, but too much of it is a bad thing. That’s why we aim to restore the immune balance, or homeostasis.”

Little’s team injected the capsules into mice and discovered evidence that disease symptoms are dramatically reduced and that proteins and other substances involved in regrowth of gum tissue had reduced and that proteins and other substances involved in regrowth of gum tissue had reduced.

This finding offers encouragement that the treatment could not only rebalance the immune system, but also prompt regrowth of lost gum and bone tissue in the mouth.

The researchers acknowledged funding from the Arnold and Mabel Beckman Foundation, the Wallace H Coulter Foundation and the National Institute of Dental and Craniofacial Regeneration of the NIH (1R01DE021058-01).

This research was presented at a meeting of the American Chemical Society.

Source: American Chemical Society http://portal.acs.org/portal/acs/org/content/1. Adult Dental Health Survey 2009, NIES Information Centre for Health and Social Care

Global Oral Care partnership

Colgate is pleased to announce a global partnership with OMBON, a worldwide leader in innovative sensing and control technology for the manufacture of medical and home healthcare products.

OMBON, based in Japan, are a leading innovator in their field, and produced the first Japanese components for X-ray machines in 1955. OMBON has continued to develop ground breaking home healthcare products, including innovative blood pressure monitors during the 1970s and developed the first digital thermometer in 1985.

This unique partnership combines OMBON technology, with the oral care expertise of Colgate, to provide the next generation of electric toothbrushes. Colgate will launch this new and innovative range at the British Dental Trade Association Dental Showcase 4-6th October, ExCel London.

To have a chance of being amongst the first dental professionals to try this break-through technology, simply register your details at www.colgatemedical.co.uk. Full terms and conditions are available on the website.

Improving periodontal health in style

A number of key decision makers and specialists in periodontology, dental public health & restorative dentistry came together recently to review the latest additions to the wealth of clinical evidence based toothpaste to treat and maintain your patients’ periodontal health.

Colgate® Total® Pro Gum Health toothpaste is medically licensed to improve gingival health and reduce the progression of periodontitis. It contains clinically proven Triclosan & Copolymer Technology to improve gingival health for everyday use, as part of treatment and maintenance of periodontal health.

Recommend an evidence-based toothpaste to treat and maintain your patients’ periodontal health.

For further information on New Colgate® Total® Pro Gum Health toothpaste and details of its medicinal licence status, visit www.colgatemedical.co.uk

Dr Anousheh Alavi, Scientific Affairs Manager, Colgate UK & Ireland, opened the proceedings by reviewing the status of periodontal health and preventative behaviour data from the recent Adult Dental Health Survey. Dr Alavi also shared the hierarchy of evidence base, from systematic reviews to consensus of experts, in line with the ranking of evidence in the Department of Health publication: Delivering Better Oral Health and shared some insight into the difference between therapeutic and cosmetic claims made by toothpaste manufacturers, depending on whether the products had medicinal licence status.

Dr Fotinos Panagakos, Colgate Director of Clinical Research, based in Piscataway, NJ, USA, reviewed the latest clinical studies on Triclosan & Copolymer Technology, used exclusively in Colgate Total, before sharing a compelling wealth of clinical evidence on the effects of Triclosan & Copolymer on plaque, gingivitis, periodontitis, and peri-implants around dental implants.

New Colgate® Total® Pro Gum Health toothpaste is medically licensed to improve gingival health and reduce the progression of periodontitis. It contains clinically proven Triclosan & Copolymer Technology to improve gingival health for everyday use, as part of treatment and maintenance of periodontal health.

Recomm
Protocol building for effective periodontal case management in general practice

Mhari Coxon discusses why having a protocol is vital

One way to ensure that the advice, assessment, diagnosis and treatment path remains at a consistently high standard in practice is to build a protocol which the whole practice will work to. This also makes induction training for new staff members robust and in keeping with CQC guidelines. The protocol is a map for anyone to refer to which will add reassurance and weight to their own conclusions. The secret to success within general practice is to be consistent in your delivery. Protocols really help this to happen.

What should go in your protocol?

Well, if I am honest, as much or as little as you feel appropriate. If you have several dental professionals working on periodontal cases in your practice, for example three part-time hygienists and a specialist periodontist who comes in once a month, then you would need a detailed protocol as they will undoubtedly have different opinions on what is right and not and what should be advised or used and not. The initial mapping of the protocol can take longer the more dental professionals working on periodontal cases in your practice, but this is purely assessing for risk in relation to periodontal treatment.

A basic protocol would contain:

- Risk assessment guidelines
- Risk measurement guide-lines and the plan for each
- When to refer

Protocol building for effective periodontal case management in general practice

Rheumatoid Arthritis: The causes of gum disease and RA may be related. One doesn’t cause the other, but when one is present the other is more likely to be going on. If your gums are inflamed you may be at increased risk for developing RA.

Have you ever been diagnosed with Rheumatoid Arthritis? Yes No

• If you have rheumatoid arthritis, emerging research suggests that eliminating any gum disease and then keeping it at bay can lessen the crippling effects of arthritis.

Special Concerns for Females:

Pregnancy: Tell us if you are planning to become pregnant. Gum disease can make it up to eight times more likely that you will have a pre-term low birth weight baby. You can greatly reduce the likelihood of having an adverse pregnancy outcome by finding out if you have any gum disease and then doing whatever is necessary to eliminate it before you get pregnant. It is also important to make sure your gums are inflammation free while you are pregnant.

Osteoporosis:

Do you have osteoporosis? Yes No

The following are risk factors for osteoporosis: Post-menopausal, Family history of osteoporosis, Early menopause, Rheumatoid Arthritis, Inadequate exercise, Smoking

Have you ever been tested? Yes No

According to the protocol, it is recommended to refer to the CQC guidelines to incorporate caries and tooth surface loss but this example is purely assessing for risk in relation to periodontal treatment.

The protocol is a map for anyone to refer to which will add reassurance and weight to their own conclusions.

Tobacco Use: This is THE most significant risk factor for gum disease

Please circle if you now or have ever used

<table>
<thead>
<tr>
<th>Tobacco Use</th>
<th>Amount Per day</th>
<th>Used for How Many Years</th>
<th>If you quit, when did you quit?</th>
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Heart Attack/Stroke: Untreated gum disease can increase your risk of heart attack or stroke

Do you have any other risk factors for heart disease or stroke? (please circle)

None

Family history of heart disease

Tobacco Use: This is THE most significant risk factor for gum disease.

Diabetes: Diabetics are more prone to gum disease. If left untreated, gum disease makes it harder to control their blood sugar. When gum disease is eliminated, diabet-ics may improve their blood sugar control and make diabetic complications less likely.

Any family history of diabetes? Yes No

Have you had any of these warning signs of diabetes?

None

Frequent urination

Excessive thirst

Excessive hunger

Weakness and fatigue

Slow healing of cuts

Unexplained weight loss

Have you ever been tested? Yes No

Handa or stroke

Do you have any other risk factors for heart disease or stroke? (please circle)

None

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Have you ever been diagnosed with Rheumatoid Arthritis? Yes No

If you have rheumatoid arthritis, emerging research suggests that eliminating any gum disease and then keeping it at bay can lessen the crippling effects of arthritis.
Please note that the wording of these questions is to ensure they are easy to understand for the patient and easy to answer. The risk assessment questionnaire is useful in more than one way. It is extremely useful for gathering information to aid diagnosis and categorisation of a patient. It is also a subtle tool for moving the patient from pre-contemplation to contemplation regarding their gum health. This, combined with a little open question session, can create a non-confrontational opening to discussion and advice and education sessions.

BPE guidelines and a guide to care – see www.bsperio.org.uk for full details

Careful assessment of the periodontal tissues is an essential component of patient management. The BPE is a simple and rapid screening tool that is used to indicate the level of examination needed and to provide basic guidance on treatment need. Please note; the BPE does not provide a diagnosis.

How to record the BPE

1. The dentition is divided into six sextants: upper right (17 to 14), upper anterior (15 to 25), upper left (24 to 27), lower right (47 to 44), lower anterior (45 to 55), lower left (54 to 57)

2. All teeth in each sextant are examined (with the exception of 3rd molars).

3. For a sextant to qualify for recording, it must contain at least two teeth. (If only 1 tooth is present in a sextant, the score for that tooth is included in the recording for the adjoining sextant).

4. A WHO BPE probe is used (World Health Organisation probe). This has a “ball end” 0.5 mm in diameter, and a black band from 5.5 to 5.5 mm. Light probing force should be used (20-25 grams). – you can calibrate your probing using an electric scale to measure 10 probe movements and take the mean number. You can also invest in a set of pressure sensitive probes if you want ot be gold standard.

Probing
The probe should be “walked around” the sulcus/pockets in each sextant, and the highest score recorded. As soon as a code 4 is identified in a sextant, the clinician may then move directly on to the next sextant, though it is better to continue to examine all sites in the sextant. This will help to gain a fuller understanding of the periodontal condition, and will make sure that furcation involvements are not missed. If a code 4 is not detected, then all sites should be examined to ensure that the highest score in the sextant is recorded before moving on to the next sextant.

BPE Scores

0 No pockets >5.5 mm, no calculus/overhangs, no bleeding after probing (black band completely visible)

1 No pockets >5.5 mm, no calculus/overhangs, but bleeding after probing (black band completely visible)

2 No pockets >5.5 mm, but supragingival calculus/overhangs (black band completely visible)

3 Probing depth 3.5-5.5 mm (black band partially visible, indicating pocket of 4-5 mm)

4 Probing depth >5.5 mm (black band entirely within the pocket, indicating pocket of 6 mm or more)

* Furcation involvement

2. Implant strength & fatigue testing done in accordance with ISO standard 14801.
3. Initial clinical efficacy of 3-mm implants immediately placed into function in conditions of limited spacing. Reddy MS, O’Neal SJ, Haigh S, Aponte-Wesson R, Geurs NC.
4. Laser-Lok microchannels create a physical connective tissue attachment (unlike Sharpey fibers).
BPE: Inadvertent

0 No need for periodontal treatment - but lots of praise is good!
1 Oral hygiene instruction (OHI)
2 OHI, RSD. Assess the need for more complex treatment; referral to a specialist may be indicated.
3 OHI, root surface debride-
ment (RSD)
4 OHI, RSD. Assess the need for more complex treatment;

referral to a specialist may be indicated.

When to refer

If a specialist is at hand, there can be a temptation to refer on to them quickly. In some cases this is entirely appropriate.

Periodontal Disease

How do you measure success?

Dentomycin offers:

• 42% reduction in pocket depth after 12 weeks
• broader spectrum of antibacterial action2 with greater all round activity than metronidazole or tetracycline
• conditioning of the root surface3 and enhanced connective tissue attachment4
• improved healing through inhibition of degradative collagenases5
• effective treatment of chronic periodontitis which has been associated with cardiovascular diseases6,9


Information about adverse event reporting can be found at www.yellowcard.gov.uk. Adverse events should also be reported to

Blackwell Supplies, Macready House, Gillingham, Kent ME8 0SB or by telephone: 01634 877525

Dentomycin abridged prescribing information. Please refer to the Summary of Product Characteristics before using Dentomycin 2% w/w Periodontal Gel (minocycline as hydrochloride (dihydrate). Presentation: a light yellow coloured gel containing minocycline as its hydrogen chloride (dihydrate equivalent to minocycline 2% w/w. Each disposable application contains minocycline HCl equivalent to 10mg (0.65g) of gel. Uses: Moderate to severe chronic adult periodontitis as an adjunct to scaling and root planing in pockets of 5mm depth or greater. Dosage: For application in scaling and root planing to pockets of at least 5mm depth. Gel shall fill each pocket to overflow. Applications should be every 14 days for 3–4 applications (e.g. 0.32 and 0.64 weeks). This should not normally be repeated within 6 months of initial therapy. Use only one applicator per patient per visit which should be wiped with 70% alcohol between applications to each tooth. Avoid both tooth brushing, flossing, mouth washing, eating or drinking for 2 hours after treatment. Blisters: – As adults, caution in hepatic dysfunction or severe renal impairment. Children – contraindicated in children < 12 years. Not recommended in children > 12 years. Contraindications: Hypersensitivity to tetracyclines, complete renal failure, children under 12 years. Precautions: Closely observe treatment area. If swelling, papules, subcutaneous etc occur, discontinue therapy. Safety in pregnancy and lactation not established. Side-effects: Incidences are low and include local irritation and very rarely diarrhea, upset stomach, mild dysphoria and hypersensitivity reactions. Storage: 2°-8°C. Legal category: POM. Presentation and cost: Disposable applicator in an aluminium foil pouch. Each carton contains 24 pouches. Carton 2, 40000365. PA 103/21/1. Product Licence Holder: Henry Schein UK Holdings Limited, Macready House, Denton Close, Gillingham Business Park, Gillingham, Kent ME8 0SB. Telephone: 020 7224 1457 Fax 020 7224 1454 Distributed by: Blackwell Supplies. A division of Henry Schein UK Holdings Ltd, Macready House, Gillingham Business Park, Gillingham, Kent ME8 0SB. Telephone: 020 7224 1457 Fax 020 7224 1454 Date of preparation: February 2011 Registered Trademark BLA/DEN 18.

About the author

Mhari Coton has 20 years experience in dentistry, working as a hygienist and health educator for the dental health adviser service. She is a highly commended hygienist in central London. From chairing the London BSDH for 5 years, and working as an MHI, Mhari excels at motivating and co-ordinating a team and utilising skills, developing leadership and developing self efficacy in members. Throughout her career Mhari has developed hygiene protocols and plans in practices which have continued to be used with great success. Mhari is Clinical Director for CPHD Ltd, a training company offering motivational and interactive development courses to the dental team. A keen writer, Mhari is on the Publications Committee of Dental Health, the British Society of Hygienists and Therapists (BSDHT) Journal, has a conversational column in Dental Tribune, and articles for many other publications and online sites. As a speaker Mhari has presented nationally and internationally for many groups including the British Orthodontic Society Special Interest Group, the British Society of Hygienists and Therapists (BSDHT), the International Symposium of Dental Hygiene, the British Orthodontic Society and many others. In 2006 she was the Probe towards hygienist of the year, and was highly commended in 2010. 2011 saw her placed 15 in the Dentistry Top 50 most influential people in the UK.
Insights into the latest therapy options for periodontitis

A look at Europerio7 in Vienna

According to Dr. Shalaby, “The development of Ligosan Slow Release for non-surgical therapy of periodontitis is a good example of functional technological innovation”. Its main feature is its biogradable carrier substance comprised of hydrophobic and hydrophilic parts, which ensure that the initially fluid consistency enables penetration into the deep areas of the periodontal pocket that are difficult to reach. Liquid environments increase the viscosity, creating a gel consistency that ensures that the carrier substance remains at the active site. This ef-

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Professor Lang concentrated his presentation on the management of deep pockets. Currently considered equivalent to a probing pocket depth of ≥ 6 mm, this correlates with a significantly increased risk of tooth loss. This is also the level at which the composition of biofilm and its pathogenicity changes. The local administration of adjunctive antibiotics requires the application of a significantly higher concentration of active ingredients in order to kill the periodontal pathogenic bacteria. In addition, the delivered substance must remain at the active site for a sufficient length of time in order to ensure continued release of the active ingredient.

A recently completed study by the ERGOPerio group (Tonetti et al., 2012) investigated the therapeutic effect of biofilm, a procedure that is considerably more difficult in the case of implant surfaces than in the case of natural dentition. Currently there is no standard, evidence-based approach to therapy: local antibiotics may provide an answer for the future, however, this must first be borne out by a study. Nevertheless, Professor Lang summarises as follows: “Nothing excuses the patient from cleaning his teeth every day.”

Dr. Walerd S.W. Shalaby, Chief Science Officer at Poly-Med Inc., USA, continued in the same vein as Professor Lang, and presented the latest biomaterials for oral and periodontal applications. He provided detailed information on the critical aspect of the slow release of active ingredients in local antibiosis.

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Heraeus’ stand at Europerio

Delegates at the event

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A part of this year’s Europerio in Vienna, Heraeus held two symposia on the latest developments in the treatment of periodontitis. The question investigated by the first session on Friday morning was how local antibiotics can assist in the treatment of periodontitis. Following a brief introduction from Professor Niklaus P. Lang from the University of Hong Kong, China, Professor Maurizio S. Tonetti, Executive Director of the European Research Group on Periodontology (ERGOPerio), Italy, opened the first Heraeus symposium with his presentation on current understanding of periodontitis and how it changes treatment. He began by immediately emphasising that periodontitis has become a serious health problem in Europe.

In addition to the role played by biofilm in triggering development, individual susceptibility to periodontal disease is also an increasingly important factor. This is influenced by genetic predisposition and environmental risk factors, and determines the intensity and clinical presentation of the periodontal inflammatory process.

Periodontitis is also proven to have various effects on the body as a whole. In addition to providing systematic periodontal therapy with regular follow-up for the rest of the patient’s life, it is therefore also important to limit additional risk factors. With professional preventive measures geared towards the patient’s individual symptoms, further progression of the condition can be prevented in the long-term.

Professor Tonetti concluded with an outlook on possible future therapies. In a dog (beagle) model of replacement therapy, “friendly” bacteria such as streptococcus sanguinis, streptococcus salivarius and streptococcus mitis appear to have a positive impact on inflammatory response when applied sub-gingivally in addition to scaling & root planing (SRP). This is demonstrated in X-ray images by increased bone density and bone level of infection in the diagnosis of periodontitis. The greatest challenge here is the removal of biofilm, a procedure that is considerably more difficult in the case of implant surfaces than in the case of natural dentition. Currently there is no standard, evidence-based approach to therapy: local antibiotics may provide an answer for the future, however, this must first be borne out by a study. Nevertheless, Professor Lang summarises as follows: “Nothing excuses the patient from cleaning his teeth every day.”

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The press breakfast

Briefing the assembled press

effect results in slow, continued release of the active ingredient in sufficient concentrations over a period of at least 12 days. Thanks to the biodegradable nature of the product, the patient does not require a further appointment and also benefits from relatively low systemic doxycycline exposure.

Following Dr. Shalaby’s detailed look at the advantages of the innovative slow release gel formula, Professor Peter Eickholz, from the University of Frankfurt, Germany, continued with the question of the effect to be expected following adjunctive administration of the new doxycycline gel. He began by listing the indications for local antibiotic therapy and continued with the results of clinical studies, which he used to present scientific evidence for the additional benefits of 14% SRD gel. In combination with SRP in the case of previously untreated periodontitis, this has been proven to lead to improved attachment as well as greater pocket reduction that is clinically more relevant than achieved by SRP alone (Eickholz et al., 2002). A comparison of sub-gingival, topical administration of antibiotics and mechanical debridement has shown comparable clinical efficiency (Eickholz et al., 2005). The primary benefits in the case of any residual deep pockets during SPT (Tonetti et al., 2012) had already been discussed in Professor Lang’s presentation. In his conclusion, Professor Eickholz emphasised a further feature of doxycycline: not only does it have an antibacterial effect, it is also anti-inflammatory. Clinical studies have also shown that once-off application of a 14% SRD gel in patients with periodontal disease reduces the presence of certain periodontal pathogenic bacteria in the sub-gingival plaque.

Risk-based follow-up ensures long-term therapy success

The second event on Friday evening focused on current therapy options in periodontal treatment. In the first presentation, Professor Petra Ratka-Krüger from the University of Freiburg, Germany, looked at supportive periodontal therapy in daily practice, underlining the importance of SPT in long-term therapeutic success. She based her conclusions on a variety of studies, all of which provide scientific evidence of the positive impact when patients with periodontal disease are treated regularly and consistently using SPT techniques. Based on a risk assessment at various levels (Lang & Tonetti, 2003), an individual risk analy...
sis can be performed, helping to prevent insufficient or excessive treatment. Professor Batka-Krüger continued with a description of the timeframe for a follow-up check-up, providing detailed information on the individual steps and what they entail. She referred back to the positive effect discussed in the first Heraeus symposium, specifically that of additional topical administration of SRD gel in the case of previously untreated cases of periodontitis (Eickholz et al., 2002), and once again emphasised the advantages of local antibiotics: reliable, simple and fast application. The additional benefits of this approach combined with SRP during SPT are also scientifically proven (Tonetti et al., 2012). In this regard, she also referred to a study (Dannewitz et al., 2009) in which the effect of topical SRD administration in addition to SRP during SPT was investigated in teeth with furcation defects. Once again, improvement was observed at furcation sites compared with SRP alone. In her conclusion, Professor Batka-Krüger described supportive periodontal therapy as the key to long-term therapy success. Regular participation in risk-based follow-up allows recurrences to be recognised and treated at an early stage, thus preventing tooth loss. Local antibiotics can boost the effect of mechanical therapy, contributing to the success of treatment.

In the second presentation “Telomere Length, Oxidative Stress and Chronic Periodontal Inflammation: Implications for Supportive Therapy”, Juliette Reeves, Clinical Director at Perio-Nutrition, Great Britain, looked at previously little-known links with periodontitis. Telomeres are regions at each end of a chromosome that shorten each time cells divide. This process is accelerated by oxidative stress. The length of telomeres is related to aging, chronic infection, oxidative stress and systemic illness (Zglinicki et al., 2005). Over the last ten years, the effects of periodontitis on general health have been clearly established. Masi et al. (2011) found that shorter telomeres are linked to periodontitis and that their size correlates with oxidative stress and the gravity of the condition. Gilley et al. (2008) proved that telomere degradation, the extent of chronic infection and oxidative stress can be reduced through changes in lifestyle (smoking, nutrition, obesity, stress). In her presentation, Ms. Reeves once again demonstrated the evidence-based links between living a healthier life and periodontal and general health, and defined the control of inflammatory response as a primary goal of treatment.
Gumsaver® unveils a brand new oral health system designed to treat and prevent gum disease

The gumsaver® team have just returned from presenting this data at the International Association for Dental Research (IADR) General Session in Brazil and received wide acclaim from their global colleagues.

Invented by Leamington-Spa based dentist Dr Hani Mostafa, Gumsaver® has been designed to tackle one of the UK’s most significant public health challenges today.

Inevitability

“As a practicing dentist for 14 years, I have always been frustrated by the inevitability of tooth loss amongst patients with periodontal disease. Since 2006, I have been advocating the use of a narrow headed inter-dental brush and sub-gingival oral hygiene techniques, as taught by Philip Ower and the late Graham Smart. I have designed Gumsaver® to enable the dentist, therapist and hygienist and more importantly the patient, to clean below the gum-line, thereby removing sub-gingival pathogenic bacteria from the root surface.”

The gumsaver® system includes a soft bristled tool specifically designed to remove the bacteria from beneath the gum line and between the teeth, and a simple three step cleaning technique.

We have designed Gumsaver® to make the task of looking after gums and teeth simple for dentists, therapists, hygienists and the patient:

- The ergonomic design of the brush along with the simple 5 step technique means patients can be taught how to treat and prevent gum disease at home.
- The bristle heads are angled towards each other and are spaced apart, providing a small clearance in which the inter-dental spaces are lined up during use.
- An up and down motion will guide a head under the gum-line and into the pocket to remove bacteria rooted deep inside the inter-dental space. Just repeat in between every tooth, inside and out.
- The unique angle of the heads make it easy for the patient to use and the soft bristles will reduce any discomfort, thereby improving patient compliance.

Audit

In an audit of 95 patients with pocket depths of 5.5 – 10mm (BPE 3 or 4), Warwick Dentistry found that 98 per cent of subjects using the Gumsaver® system experienced a significant improvement. After just six months of using the Gumsaver® system, a staggering 65 per cent of subjects presented BPE scores of 0. In other words, their gum disease had been completely eradicated. The Gumsaver system was designed to make the task of looking after gums and teeth simple for dentists, therapists, hygienists and the patient.
A historical perspective of the development of the Laser-Assisted New Attachment Procedure is presented in this article. The simplicity of the protocol is discussed, as well as its nuances. The concept of the Laser-Assisted New Attachment Procedure (LANAP) was born back in 1989 with Drs Robert Gregg II and Del McCarthy. As with most general dentists battling with the day-to-day realities of periodontal disease, they were looking for an answer on how to better care for their patients. The reality at the time was that periodontal disease was difficult to treat and maintain. It was primarily based on older concepts of wound debridement and amputation. Once treated, relapse was common. The patients would recall their experiences to friends and family, making case acceptance for periodontal treatment often a challenge. During this same time, Drs Gregg and McCarthy were involved in the early use of Nd:YAG lasers in dentistry.

Confronted with patients not wishing to lose teeth and declining traditional surgery or extraction, they developed the LANAP protocol, which eventually led to its US FDA clearance in 2004. In concept, the LANAP protocol is rather simplistic. The ultimate goal is to set up the periodontal environment to promote self-regeneration of the lost attachment and osseous structure that result from LANAP—Laser-Assisted New Attachment Procedure. Reinforced when new attachment was found on all the LANAP-treated teeth in the initial histology studies done by Dr Ray Yukna. LANAP is also a very safe protocol. The use of the Nd:YAG laser has often been of concern by some owing to possible damage to root surfaces and the tissue attachment but, with a basic understanding of laser physics, laser-tissue interaction parameters were developed that enabled the use of an Nd:YAG laser in a very safe and effective manner. LANAP is also standardised. That is, before a doctor can obtain his laser he goes through three days of training: one day of laser physics and laser-tissue interaction and then two days of hands-on training with patients. This is then followed up by two more separate days of treating patients to refine techniques and add other treatment modalities utilising the Nd:YAG. Because of the simplicity, predictability and standardisation of LANAP, it has become a very safe and effective way to treat periodontal disease. The simplicity of the LANAP protocol can be seen in Table I.

Step A

Patients undergo a full dental examination and treatment plan—as with all dentistry. If they have an appropriate diagnosis of Type III or greater periodontal disease, all treatment options are presented to the patient. The initial step of the LANAP protocol, after anaesthesia has been administered, is bone sounding around each tooth. The objective is to determine areas of osseous defects that cannot be seen radiographically. Step B This is the first time the laser is used. The objective of this step is to remove only diseased epithelium, to affect selectively bacte-
ria associated with periodontal disease, to affect the calculus present, and to affect thermo-labile toxins. The bacteria that are associated with periodontal diseases are pigmented and are found in the sulcus, within the root surface and within the epithelial cells. One of the reasons for the predictability of this step is in the selection of a fre-erunning pulsed Nd:YAG laser with a wavelength of 1,064 nm and pulsed in a range of seven different microseconds. The shorter 1,064 nm wavelength was selected for its affinity for melanin or dark pigmentation, unlike the longer wavelengths that are highly absorbed in water and would have a shallow depth of penetration. This ability to increase the depth of penetration of the laser energy with minimal collateral damage is the reason that the diseased epithelium can be selectively removed without damage to the underlying tissue, leaving intact rete pegs. The diode lasers are also known for this selective absorption in pigmented tissues, but the freerunning, pulsed Nd:YAG lasers differ in their ability to operate at very high peak powers in very short timeframes, which allows the Nd:YAG to have the greater depth of penetration and the lack of collateral damage.

**Step C**

This step in the LANAP protocol is straightforward; it is just a matter of using the piezo-scalers to remove the calculus present on the root surfaces. The removal of calculus is believed to be easier after the interaction of the laser energy with the calculus. The first interaction of the laser results in the initial formation of a mini-flap, thereby further assisting in the removal of calculus because of increased visibility and access to the calculus.

**Step D**

The next step again utilises the laser. This time the parameters are varied to enhance the ability to form a fibrin clot to close the mini-flap and to disinfect the site again. The formation of the stable fibrin clot is significant, as it is stable for approximately 14 days. The role of the fibrin clot is to keep the...
sulcus sealed against bacterial infiltration and to prevent the growth of epithelium down into the sulcus. Older laser wavelengths not only lack the ability to form this stable fibrin clot, but also require repeated treatments to prevent epithelium growth down into the sulcus. The ability to select the laser tissue interaction specifically is unique to the PerioLase MVP-7 (Millenium Dental Technologies). Through the use of specific fibre sizes, energy, repetition rates and irradiance, standardisation of the energy at the fibre tip, this protocol can be followed in a predictable and reproducible manner. The high standard of training that each LANAP doctor receives also contributes to the predictability of this protocol and to its safety. Patients often present with different tissue types along with different degrees of disease. One of the purposes of the hands-on training is learning to recognise these differences and how to change the laser parameters accordingly so that the desired laser-tissue interactions are achieved.

Step E
The fifth step in LANAP is the compression of the fibrin clot to enhance the healing process. Because laser wounds heal by secondary intention, closer approximation enhances the healing time.

Step F
Following the compression and stabilisation of the clot, the last step of LANAP is refining the occlusion. Occlusion has been considered a greater cofactor in the progression of periodontal disease than smoking. In order to minimise this role, extensive occlusal refinement is required. Other laser wavelengths not sub-gingival restorations and occlusal refinements. No sub-gingival restorations and occlusal refinements are achieved.

LANAP case 1
The patient in this case was a 40-year-old female patient with a history of lupus, rheumatoid arthritis and Sjögren’s syndrome. She was also a smoker. There was generalised deep pocketing as seen in her periodontal charting. The extent of the osseous defect is shown on the lingual view of the right quadrant preoperative CBT scan. The initial post-LANAP evaluation was done at 15 months. Post-operative probing is shown in Figure 5. The CBT from the lingual view of the right quadrant at 15 months postoperatively is shown in Figure 6. The change in the osseous defects is apparent. Minimal to no recession is shown in the preoperative clinical photograph in Figure 7 and the post-operative in Figure 8.

LANAP case 2
The patient in this case was a 59-year-old male patient, with Type 1 diabetes and a smoker. His periodontal pocketing was 7 mm on the mesial second premolar. The preoperative X-ray is shown in Figure 9 and the 56-month post-LANAP X-ray in Figure 10. The 7 mm pocket had been stable and maintained at 5 mm for the last 56 months. The LANAP protocol will be 21 years old this year. It is coming of age. It has stood the test of time. There are over 1,000 trained clinicians applying LANAP. They have all been standardised. The uniqueness of the protocol is that whether the doctor is new to LANAP or a veteran “LANAP’er”, his results are similar. During its early stages, early adopters accepted LANAP with anecdotal evidence alone, which was reinforced by the individual successes seen clinically. It was further validated by Dr Bay Yukna’s histological studies in 2005. As the LANAP...