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**Mouth cancer is ‘most frightening’ cancer**

November is Mouth Cancer Action Month, a campaign organised by the British Dental Health Foundation (BDHF) that aims to raise awareness of the risks and symptoms of the disease.

"Mouth cancer can severely affect some of the very things we take for granted. Speaking, eating, drinking and breathing can all be affected by radiotherapy, chemotherapy and surgery resulting from the disease. Throughout the campaign we urge everyone to take action and visit their dentist. They are in the best position to check your mouth thoroughly for signs and symptoms of the disease."

Dr Nigel Carter OBE, Chief Executive of the BDHF, said: "Tohacco use and drinking alcohol to excess can increase the risk of developing mouth cancer by up to 50 times. Experts forecast the human papillomavirus (HPV) will overtake smoking as the principle cause of the disease within the next ten years, and almost half of all cases in the UK have been linked to poor diet.

"The campaign is a great opportunity for the public to learn about the risks and what to look out for. Ulcers that do not heal within three weeks, red and white patches and unusual lumps or swellings in the mouth should not be ignored. Our advice is clear - if in doubt, get checked out."

Turn to page six for more information about Mouth Cancer Action Month.

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"It is estimated that around 60,000 people in the UK will be diagnosed with mouth cancer in the next decade. Without early detection, an estimated 50,000 will die.

Henry Clover, Deputy Chief Dental Officer from Denplan, said: “Given that more than half of people we asked said mouth cancer was more frightening than other cancers, I would hope this concern translates into action.

"We urge everyone to take action and visit their dentist. They are in the best position to check your mouth thoroughly for signs and symptoms of the disease.""
Unregistered dental therapist prosecuted

Ms Penvose was still practising, despite being removed from the register. It was alleged that she had provided her employer with forged copies of her certificate of registration and indemnity insurance certificate.

Ms Penvose was arrested by South Yorkshire Police on 15 October 2015 and admitted to the offences, as well as admitting to treating more than 5,500 patients during the period that she was not registered.

On 1 November 2015 she appeared at Barnsley Magistrates’ Court and pleaded guilty. She was sentenced to a 12 month conditional discharge and ordered to pay a £15 victim surcharge.

‘More openness and transparency’ for NHS

NHSE England will announce new measures that it says will increase public participation as part of its pledge to openness and transparency.

The new commitments include publishing more clinical level data, publishing more overarching clinical indicators, linking data from GP practices to data from all hospitals, and extending the ‘Friends and Family Test’ (a programme that asks patients whether they would recommend hospital services) to cover GP practices.

These new measures come as the Prime Minister calls for more transparent government. David Cameron will address the 60 nations represented at the Open Government Partnership (held in London on 51 Oct 2015) and raise this issue.

Tim Kelsey, NHSE England’s National Director for Patients and Information, said: “This is the single most important step forward in transparency for healthcare anywhere in the world.”

“The English healthcare system is already one of the most transparent in the world – publishing more information than any other country. But these new measures will transform outcomes, put citizens at the centre of everything we do and will provide the means by which NHS England will be at the cutting edge of medical science.”

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Dental Tribune UK Ltd.
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Editor Lisa Tennenthand Tel: 020 7400 8970
Email: healthcare-learning.com

Advertising Director Joe Lapsis Tel: 020 7400 8909
Email: healthcare-learning.com

Sales Executive Joe Ackah Tel: 020 7400 8914
Email: joe.ackah@healthcare-learning.com

Design & Production Elena Uzun Tel: 020 7400 8970
Email: elena@healthcare-learning.com

Editorial Assistant Angelika Jones
Email: angelika.jones@healthcare-learning.com

Dental Tribune UK Ltd.
4th Floor, Treasure House, 19-21 Hatton Garden, London, EC1N 8BA

November 2013

‘Beckoning’ immune cells may treat gum disease

Researchers set out to evaluate carries prevalence in non-syndromic patients with cleft lip and/or palate (CLP) in comparison with a matched non-CLP population.

The researchers from The Hospital for Sick Children in Toronto conducted a literature search in order to identify articles reporting on the prevalence of carries in CLP versus non-CLP individuals.

Seven studies were used in the review, and involved a total of 474 CLP patients aged 1.5-29 years. When looking at permanent teeth, data from five of the studies suggest that CLP patients have a higher number of decayed, missing and filled (DMF) teeth than the controls, and for deciduous teeth, data from four of the studies suggest that CLP patients have a higher number of DMF teeth than the controls.

The researchers conclude that non-syndromic patients with CLP tend to have higher carries prevalence, both in the permanent and the deciduous dentition, in comparison with matched non-CLP controls.

Tobacco-purchasing age raised to 21 in NY

New York City Council has approved a measure that will raise the tobacco-purchasing age to 21.

The current purchasing age is 18 but the new bill will see make it illegal for anyone under the age of 21 to buy cigarettes, certain tobacco products and even electronic cigarettes. The council also approved another bill that will set a minimum price of $10.50 for a pack of cigarettes.

“This will literally save many, many lives,” said City Councilman James Gennaro, whose mother and father died from cancer, for a pack of cigarettes.

The councilman also released a statement that if the city ‘keeps up the momentum’ after the vote, the law could be extended to 19- and 20-year olds. Similar legislation has been approved in New Jersey, but cannot assume responsibility for

The team found that even though the amount of bacteria was unchanged, the treatment led to improvements of standard measures of periodontal disease, including decreased pocket depth and gum bleed, reflecting a reduction in inflammation as a result of increased numbers of regulatory T-cells. MicroCT-scanning showed lower rates of bone loss.

Periodontal disease could be effectively treated by ‘beckoning’ the right kind of immune system cells to the inflamed tissues, according to researchers at the University of Pittsburgh.

“Currently, we try to control the build-up of bacteria so it doesn’t trigger severe inflammation, which could eventually damage the bone and tissue that hold the teeth in place,” said Charles Seif, co-author of the study.

“But that strategy doesn’t address the real cause of the problem, which is an overreaction of the immune system that causes a needlessly aggressive response to the presence of oral bacteria. There is a real need to design new approaches to treat periodontal disease.”

“There is a lot of evidence now that shows these diseased tissues are deficient in a subset of immune cells called regulatory T-cells, which tells attacking immune cells to stand down, stopping the inflammatory response,” said Steven Little, senior author of the study.

“We wanted to see what would happen if we brought these regulatory T-cells back to the gums.”

The researchers developed a system of polymer microspheres to slowly release a signalling protein called CCL22 that attracts regulatory T-cells, and placed tiny amounts of the paste-like agent between the gums and teeth of animals with periodontal disease.

Unregistered dental therapist prosecuted

A dental therapist has been prosecuted for the illegal practice of dentistry.

Jane Penvose was registered with the General Dental Council (GDC) as a dental therapist from 1 October 1996 to 6 August 2012, when she was removed from the register for not paying her Annual Retention Fee.

On 2 September 2015, the GDC received a complaint that
Editorial comment

Welcome to November's issue of Dental Tribune.

Well, unless you actually don’t leave your practice, you cannot help but notice that November is Mouth Cancer Action Month (MCAM).

The campaign, organised by the British Dental Health Foundation and promoted throughout the UK, aims to raise awareness and encourage attendance to dental practices for screenings for a condition that can so horribly impact on a sufferer’s quality of life.

Detection at an early stage is critical so if MCAM is a timely reminder to both the public and healthcare professionals that ‘if in doubt, get checked out’.

Awareness event and screening sessions are being held all over the country – if you are a practice getting involved, let us know!

Take a look at pages 6-7 for more on the campaign, or go to the dedicated website – www.mouthcancer.org.

Recession affects food purchases in UK

People in the UK are purchasing less calories and less fruit and vegetables, according to research. Published by the Institute for Fiscal Studies (IFS), the research was presented as part of the ESRC Festival of Social Science on 4 November 2013.

“Gluttony in England? Long-term change in diet” describes changes in households’ calorie purchases since 1980. It shows that although the average weight of an adult male has increased by 9.6 kilograms, and the weight of an adult female by 7.9 kilograms, there has been a substantial reduction in calories purchased.

Calories purchased from eating out, soft drinks, snacks and confectionery increased over the period for all but young single households with particularly big increases for older single households (70 per cent) and couples with children (56 per cent). However, most calories are bought for consumption in the home, and the decline in calories from food at home was much larger than the increase in calories from eating out, soft drinks, snacks and confectionery.

Melanie Lührmann, one of the authors of the report said: “We were surprised to find that there has been a substantial decline in total calories purchased at a time when obesity has increased.

“Purchases of snack foods, soft drinks and food out have increased, and now account for a greater share of calories for most households. However, calories purchased for consumption at home have declined strongly and account for the bulk of households’ foods purchases. This does not mean that poor diet plays no part in rising obesity. But understanding the interaction between diet and physical activity is clearly crucial.”

A second report which looked at food expenditure and nutritional quality over the recession (from 2005 to 2012). It found that the average real food spending fell by 8.5 per cent from 2005-7 to 2010-12, as food spending in cash terms failed to keep up with rising food prices. From 2007 to 2012 the price of food rose by 10.2 per cent more than the price of all goods.

Least we forget, November is also Movember, a campaign for dubious facial hair to be grown to raise awareness of men’s health issues and in particular prostate cancer. If you are a ‘Mo Bro’ this year, I would love to have a picture so we can find the dodgiest Mo in dentistry!! Pictures to lisa@healthcare-learning.com

Until next month...
**Fizzy drinks tax could reduce obesity by 180,000**

Researchers from the University of Oxford and University of Reading carried out the study, which is published in the *British Medical Journal*. It was found that the tax could also raise more than £275 million for the Treasury.

Sugar drinks (fizzy drinks, squashes and cordials) have been shown to increase the risk of obesity, diabetes, cardiovascular disease and tooth decay. They only suppress appetite weakly, so consuming fewer sugary drinks is unlikely to result in an increased intake of other sources of calories.

For the study, the researchers used a large survey of shopping preferences of families in the UK to estimate how purchases of sugary drinks would change in response to a 20 per cent increase in their price.

The research suggests that purchases of sugary drinks would reduce by around 15 per cent, with the expected reduction in energy intake being 28 calories per person per week. This would result in the number of obese adults by 180,000 in the UK.

Dr Ann Rockey, Chair of the Food, says: “Please consider your colleagues in need this Christmas! We all know what an expensive time of year it is with increased fuel bills, the ever-increasing costs of a supermarket shop, Christmas and the GDC Annual Retention Fee on top. Every year we have requests for assistance from dentists in need.

In recent years there has been a threefold increase in the number of applicants who are in difficulties with their commissioning bodies or the GDC.

Vital funds have already been raised by 80 dentists and their partners who took to the dance floor and raised £2,485 for the Fund. Organised by the brunette.

Professor Richard Tiffin of the University of Reading says: “Obesity is a ticking time bomb. Doing nothing risks condemning millions of people to poor health and an early grave. This is a complex battle in which a soft drinks tax could be a useful weapon, but on its own would not go far enough in the face of such a massive problem. Sedges, lifestyles, poor education, addiction to alcohol and tobacco, and poverty all play far more significant roles than fizzy drinks in causing bad health.”

**NHS Direct to close down**

NHS Direct will be closed down in England next year following financial difficulty after winning a number of contracts for the 111 phone line.

Ministers are planning to close down NHS Direct, which was launched in 2006, at the end of March next year.

The NHS Direct service ran from the late 1990s until April this year, when the 111 service was launched. The 111 service was split into 46 different contracts and NHS Direct won 11 of them. However, due to lower payment per call compared to when it ran the old 0845 number and lower call volumes than expected, NHS Direct lost £2.5m from April to June and was heading for a deficit of £260,000 if it continued until March.

NHS Direct also runs a number of other services, including an information website, GP appointments booking phone line and complaints service. Many of these are expected to be transferred to other parts of the health service.

NHS England has overseen arrangements to transfer 111 services currently provided by NHS Direct to a range of providers, predominantly ambulance trusts.

The 111 Direct group in Wales is unaffected.

Sir David Nicholson on 1 April 2014. He has worked as an NHS manager, a health advisor to Labour, and is currently working for United Healthcare as its global health president.

Chairman Professor Sir Malcolm Grant said: “I am delighted that Simon will be taking on this exceptionally challenging leadership role for the NHS. He has huge experience, both national and global, and across all sectors, and is admired by healthcare professionals across the world for his commitment to the values of the NHS and to the provision of quality healthcare for all.

“He brings a wealth of ideas and unique experience, building on a distinguished career across the NHS, international healthcare and government. I look forward to working closely with him as we lead innovation, change and significant improvement in safety and quality to patients across all areas of the NHS.

“We have been through a rigorous global search, and engaged with a range of excellent candidates. I am confident that Simon Stevens is the right person to lead NHS England through the coming years, bringing new ideas and fresh energy.”

Simon Stevens said: “The next five years are going to be extremely challenging for the NHS. We need to find a balance between the needs of patients, staff and the public, and this is the right person to lead the way.”

Professor Sir Malcolm Grant: “I am delighted that Simon will be taking on this exceptionally challenging leadership role for the NHS. He has huge experience, both national and global, and across all sectors, and is admired by healthcare professionals across the world for his commitment to the values of the NHS and to the provision of quality healthcare for all.

Simon Stevens, a senior executive at a private US health firm, has been appointed new NHS boss.
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Government funded places and Grants available
November is…Mouth Cancer Action Month

This November healthcare professionals and dental practices all over the country are raising awareness of mouth cancer. Dental Tribune looks at the issues behind the campaign.

Mouth Cancer Action Month, organised by the British Dental Health Foundation, is an annual campaign aiming to raise awareness and screening for oral cancer in the UK population.

Sponsored by Denplan and also supported by Dentists’ Provident and the Association of Dental Groups (ADG), the BDHF uses the campaign to call on dentists, doctors and pharmacists to educate members of the general public about a disease that kills more people in the UK than testicular and cervical cancer combined, under the tagline ‘If in doubt, get checked out’.

Latest figures show more than 6,500 new cases a year are diagnosed in the UK, with one person dying every five hours from the disease. As a result, action really must be taken to raise awareness and change these figures. Chief Executive of the British Dental Health Foundation, Dr Nigel Carter OBE, highlights the importance of early detection in the battle against the disease. Dr Carter said: “If the profession can inform and urge patients that regularly attending check-ups increases the chances of mouth cancer being detected at an early stage, together we can help to raise awareness of this killer disease.

“Almost nine in ten people survive mouth cancer if it is caught early, yet the five year survival rate remains as low as 50 per cent. Encouraging patients to perform self-diagnosis such as looking for ulcers that do not heal within three weeks, red or white patches in the mouth and any unusual lumps or swelling can also help towards early detection.”

Risks
Lifestyle choices heavily influence the risk of developing mouth cancer. Tobacco use, drinking alcohol to excess, poor diet and the human papillomavirus (HPV), often transmitted via oral sex, increase the chances of mouth cancer. Dr Carter added: “The scale of increasing mouth cancer rates is very worrying. There is a clear gap in public knowledge about what causes mouth cancer that needs to be plugged. Smoking and drinking to excess increase your chances of getting mouth cancer by 30 times as much, yet so many social smokers often light up while having a drink.

“It is not fair, ethical or socially responsible to have a public health policy that leaves half of the population vulnerable to infection”

Currently in the UK all girls aged 12-13 are offered the HPV vaccine, given in three injections over the course of a year.

Experts have forecast that the human papillomavirus (HPV), often transmitted via oral sex, will overtake tobacco use as the main risk factor for mouth cancer within the next decade. Despite the high profile case involving Michael Douglas, mouth cancer campaigners the British Dental Health Foundation remain concerned at the lack of awareness about the virus.

Professor Margaret Stanley OBE from the Department of Pathology University of Cambridge, who was the keynote speaker at this year’s Mouth Cancer Action Month Parliamentary Reception in October, strongly voiced her support for men receiving the HPV vaccine. “The burden of HPV
associated cancers is now almost the same in men as in women. Men face a significant and rising risk of HPV-associated disease, and without vaccination men remain at risk.

“It is not fair, ethical or socially responsible to have a public health policy that leaves half of the population vulnerable to infection. This is why men should get the HPV vaccine immediately.”

Dr Carter supported Professor Stanley’s call for giving boys the jab: “The HPV vaccination of young men has already started in Australia and the British Dental Health Foundation is calling for the same to happen in the UK. A wealth of evidence and opinion in the USA suggests a population-wide HPV vaccination programme is now the best solution – for general public health and financial reasons. It is a debate that needs to be opened again here in the UK, as part of the on-going debate about the health and well-being of young people.

“In the UK around one in five cases of oral cancer are predicted to be as a result of HPV, yet our awareness and understanding of the virus is alarmingly low. Cases of mouth cancer have doubled in the last 50 years, coinciding with the rise of HPV, and strengthens the argument that there is not enough awareness of the risks we take when we have unprotected sex.”

Long way to go
Despite the success of previous campaigns, a recent survey shows that there is much more still to do to establish the signs and symptoms of mouth cancer in the public mindset.

The survey asked more than 2,000 people if they could name the four main risk factors for mouth cancer, with no-one able to identify the quartet of smoking, drinking alcohol to excess, poor diet and, despite Michael Douglas’ high profile case, HPV.

Worryingly, a large number of people mistakenly thought bad oral health was responsible for the disease while other answers included stress, snoring and even high blood pressure.

Dr Carter said: “For no-one to be able to correctly identify what the four causes of the disease are is both surprising and worrying. The campaign continues to play a crucial role in educating the public about the disease, and it’s clear from the survey we still have some way to go.

“The campaign is a great opportunity for the public to learn about the risks and what to look out for. Ulcers that do not heal within three weeks, red and white patches and unusual lumps or swellings in the mouth should not be ignored. Our advice is clear – if in doubt, get checked out.”

‘Our advice is clear – if in doubt, get checked out’

References
2. Research conducted on behalf of the British Dental Health Foundation by

Mouth Cancer Action Month runs throughout November. For more information, visit www.mouthcancer.org
The importance of clean water lines

Jane Armitage urges readers to be aware of clean water lines

The cleaning of water lines is something I would not normally write about but this is going to be a personal article that I would like to raise awareness to. Last year I received a telephone call from a chest consultant who told me that he thought he knew why I was having recurrent chest infections, tiredness, and persistent cough. He had taken three sputum samples from me and had grown Mycobacterium avium and Mycobacterium intracellulare, otherwise known as a Mycobacterium avium-intracellulare infection (MAI) or MAC (Mycobacterium avium Complex). These bacteria are found living in house dust and tap water. They may infect wild or domestic animals as well as humans.

I had never heard of it and was very self composed when he told me it was a type of lung infection caused by bacteria from the same genus as the one which causes Tuberculosis (Tb), but was non-contagious. Within a matter of days I was seen by a Tb specialist and commenced treatment the following day.

I was told that MAC mimics Mycobacterium tuberculosis (MtB) and is usually found in thin middle age women with low immunity. He stated that he wished I had had full-blown infectious Tb as this would have been cleared in six months. Unlike Tb, it would take a treatment plan of 18 – 24 months (three times as long as conventional Tb) and relapses are common even after taking what was described as chemotherapy antibiotics. I was ok until I saw that word then I freaked. How can this have happened? How had I caught it? Was I going to die? These were all questions I was throwing at him.

He explained that this form of non-contagious mycobacterial infection can be caught from shower heads, soil, cigarette papers, any form of sprayed water or simply by breathing the bug in. I was told I had been unlucky and his guess was I had breathed it in and slowly it had reached my lung and started to attack. The bug was already in the white blood cells which are responsible for removing infections in the body therefore it was difficult to get rid of.

MAC is resistant to many antibiotics; there are limited drugs that can be given but all come with extreme side effects which I was warned about. One drug can affect the optical nerve in the eye, the other, your liver. I remember looking at the medication and putting it back in the bag as the mere thought was freaking me out.

‘I remember looking at the medication and putting it back in the bag as the mere thought was freaking me out’
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I have now been on treatment for a year and can’t wait until I can come off. I have since had negative results and my x-ray is clear but I will have to remain on the drug regime as if there are any stray MAC bugs they will multiply and I will become very ill again.

The Consultant was impressed with how I had tolerated the treatment as many throw the towel in before completion. Several times that thought had crossed my mind, but I wanted rid; I wanted that thought had crossed my mind as many throw the towel in and I will become very ill again.

Biofilms form rapidly on dental unit waterlines. The majority of the organisms in the biofilm are harmless environmental species, but some dental units may harbour opportunistic respiratory pathogens.

Effective infection control is one of the cornerstones of good practice and clinical governance. Due to a combination of negative publicity and an increased scientific knowledge of dental unit waterlines (DUWL) biofilms and their associated risks, contamination of dental unit waterlines has become a prominent infection-control issue.

flushing the waterlines for two minutes at the start of the day and for 20-30 seconds between patients reduces the bacterial count but in DUWL where this method is used as the sole means of water quality management flushing is unlikely to provide water of drinking water standard i.e. with a total bacterial count of 100 cfu/mL, nor will flushing remove the biofilm.

It is recommended to use biocides to control the biofilms by daily draining down and cleaning of the waterlines to reduce biofilm build up. The biocide (disinfectant) can be introduced with a pressurised pump or via an independent reservoir bottle.

I didn’t catch my illness from our water lines but since I have been ill the people around me have looked not only at their water lines but at their cleaning methods at home. Many have changed their shower heads so often that I’m thinking of asking for commission.

The Health & Safety Exec and the Dept of Health have issued guidance for the treatment of DUWL. I urge you all to ensure these means of testing and cleansing the water lines are carried out. A risk assessment for managing water lines should also be carried out.

I would also advise you to look at your home, clean the showerheads, and run the shower for a couple of minutes before use.’

However, in dental units, which are not drained down at night, flushing at the start of the day will help to reduce the bacterial load caused by overnight water stagnation. Flushing between patients helps to prevent cross contamination by removing any suck-back of oral fluids that have bypassed the anti-retraction valve.

I urge you to look at your practice management. If you’ve any member of the Dept of Health with a pathway if required for managers to take their qualification in dental practice management with a Vocational Assessors award. She is also a BDA Good Practice Assessor, BDA Good Practice Regional Consultant, and has a BDA Certificate of Merrit for services to the profession. She has her own company, JA Team Training, offering a practice management consultancy service, which includes site assistance covering all aspects of practice management with a pathway if required for managers to take their qualification in dental practice management. If you’ve any memories of the early 80s or any specific choices of topics you’d like addressed, call Jane on 0114 234 3434 or email jaarmitage@bticino.co.uk.

I have been unfortunate. Don’t let this opportunistic pathogen into your life.
Endodontic irrigants and irrigant delivery systems

Dr Gary Glassman

Endodontic treatment is a predictable procedure with high success rates. Success depends on a number of factors, including appropriate instrumentation, successful irrigation and decontamination of the root canal space to the apices and in areas such as isthmuses. These steps must be followed by complete obturation of the root canals, and placement of a coronal seal, prior to restorative treatment.

Several irrigants and irrigant delivery systems are available, all of which behave differently and have relative advantages and disadvantages. Common root canal irrigants include sodium hypochlorite (NaOCl), chlorhexidine gluconate, alcohol, hydrogen peroxide and ethylenediaminetetraacetic acid (EDTA). In selecting an irrigant and technique, consideration must be given to their efficacy and safety.

Even with the use of rotary instrumentation, the nickel-titanium instruments currently available only act on the central body of the root canal, resulting in a reliance on irrigation to clean beyond what may be achieved by these instruments.

In addition, Enterococcus facalis and Actinomyces prevent or treatment of apical periodontitis such as Actinomyces israelii - which are both implicated in endodontic infections and in endodontic failure - penetrate deep into dentinal tubules, making their removal through mechanical instrumentation impossible.

Finally, E. facalis commonly expresses multidrug resistance, complicating treatment.

Therefore, a suitable irrigant and irrigant delivery system are essential for efficient irrigation and the success of endodontic treatment. Root canal irrigants must not only be effective for dissolution of the organic and inorganic layer that is created on the wall of the root canal during instrumentation. The ability to deliver irrigants to the root canal terminus in a safe manner without causing harm to the patient is as important as the efficacy of those irrigants.

Dr Gary Glassman discusses the use of irrigants

Fig. 1 Root canal complex. (Image courtesy of Dr Ronald Ordinala Zapata, Brazil.) http://www.facebook.com/ TheInternalAnatomyOfTheHumanTeeth

Endodontics in daily use
Robert Torells discusses using Dr Sargent’s technique

There is evidence that apical periodontitis is a biofilm-induced disease. A biofilm is an aggregate of microorganisms in which cells adhere to each other and/or to a surface. These adherent cells are frequently embedded within a self-produced matrix of extracellular polymeric substance. The presence of microorganisms embedded in a biofilm and growing in the root canal system is a key factor for the development of periapical lesions.

Additionally, the root canal system has a complex anatomy that consists of arborisations, isthmuses and cul-de-sacs that harbour organic tissue and bacterial contaminants. Instrumentation of small root canals.

The challenge for successful endodontic treatment has always been the removal of vital and necrotic remnants of pulp tissue, debris generated during instrumentation, the dentine smear layer, micro-organisms, and micro-toxins from the root canal system. With the introduction of modern techniques, success rates of up to 98 per cent are being achieved.

The ultimate goal of endodontic treatment per se is the prevention or treatment of apical periodontitis such that there is complete healing and an absence of infection, while the overall long-term goal is the placement of a definitive, clinically successful restoration and preservation of the tooth. For these to be achieved, appropriate instrumentation, irrigation, decontamination and root canal obturation must occur, as well as attainment of a coronal seal.

There is evidence that apical periodontitis is a biofilm-induced disease. A biofilm is an aggregate of microorganisms in which cells adhere to each other and/or to a surface. These adherent cells are frequently embedded within a self-produced matrix of extracellular polymeric substance. The presence of microorganisms embedded in a biofilm and growing in the root canal system is a key factor for the development of periapical lesions.

The combination of NaOCl and EDTA has been used worldwide for antiseptics of root canal systems. The concentration of NaOCl used for root canal irrigation ranges from 2.5 to six per cent, depending on the country and local regulations; it has been shown, however, that tissue hydrolysis is greater at the
higher end of this range, as demonstrated in a study by Hand et al. comparing 2.5 and 5.25 per cent NaOCl. The higher concentration may also favour superior microbiological outcomes. NaOCl has a broad antimicrobial spectrum, including but not limited to E. faecalis. NaOCl is superior among irrigants that dissolve organic matter. EDTA is a chelating agent that aids in smear layer removal and increases dentine permeability, which will allow further irrigation with NaOCl to penetrate deep into the dentinal tubules.

**General safety precautions**

Regardless of which irrigant and irrigation system is employed, and particularly if an irrigant with tissue toxicity is used, there are several general precautions that must be followed. A rubber dam must be used and a good seal obtained to ensure that no irrigant can spill from the pulp chamber into the oral cavity. If deep caries or a fracture is present adjacent to the rubber dam on the tooth being isolated, a temporary sealing material must be used prior to performing the procedure to ensure a good rubber dam seal. It is also important to protect the patient’s eyes with safety glasses and protect clothing from irrigant splatter or spill.

It is very important to note that while NaOCl has unique properties that satisfy most requirements for a root canal irrigant, it also exhibits tissue toxicity that can result in damage to the adjacent tissue, including nerve damage should NaOCl incidents occur during canal irrigation. Furthermore, Salzgeber reported in the 1970s that apical extrusion of an endodontic irrigant routinely occurred in vivo. This highlights the importance of using devices and techniques that minimise or prevent this. NaOCl incidents are discussed later in this article.

**Irrigant delivery systems**

Root canal irrigation systems can be divided into two categories: manual agitation techniques and machine-assisted agitation techniques. Manual irrigation includes positive-pressure irrigation, which is performed with a syringe and a side-vented needle. Machine-assisted irrigation techniques include sonic and ultrasonic systems, as well as newer systems such as the Endo-Vac (SybronEndo), which delivers apical negative-pressure irrigation, the plastic rotary F-File (Plastic Endo), the Vibhringe (Vibringe), the Rinsendo (Air Techniques), and the EndoActivator (DENTSPLY Tulsa Dental Specialties).

Apical vapour lock

Since roots are surrounded by the periodontium, and unless the root canal foramen is open, the root canal behaves like a close-ended channel. This produces an apical vapour lock that resists displacement during instrumentation and final irrigation, thus preventing the flow of irrigant into the apical region and adequate debridement of the root canal system. Apical vapour lock also results in gas entrapment at the apical third. During irrigation, NaOCl reacts with organic tissue in the root canal system, and the resulting hydrolysis liberates abundant quantities of ammonia and carbon dioxide.

This gaseous mixture is trapped in the apical region and quickly forms a column of gas into which further fluid penetration is impossible. Extension of instruments into this vapour lock does not reduce or remove the gas bubble, just as it does not enable adequate flow of irrigant.

The phenomenon of apical vapour lock has been confirmed in studies in which roots were embedded in a polyvinylsloxane impression material to restrict fluid flow through the apical foramen, simulating a close-ended channel. The result in these studies was incomplete debridement of the apical part of the canal walls with the use of a positive-pressure syringe delivery technique. Micro-CT scanning and histological tests conducted by Tay et al. have also confirmed the presence of apical vapour lock. In fact, studies conducted without ensuring a close-ended channel cannot be regarded as conclusive on the efficacy of irrigants and the
In a paper published in 1985, based on research Chow determined that traditional positive-pressure irrigation had virtually no effect apical to the orifice of the irrigation needle in a closed root canal system. 67 Fluid exchange and debris displacement were minimal. Equally important to his primary findings, Chow set forth an invariable paradigm for endodontic irrigation: “For the solution to be mechanically effective in removing all the particles, it has to: (a) reach the apex; (b) create a current (force); and (c) carry the particles away.” 67 The apical vapour lock and consideration for the patient’s safety have always prevented the thorough cleaning of the apical 3mm. It is critically important to determine which irrigation system will effectively irrigate the apical third, as well as isthmuses and lateral canals, and in a safe manner that prevents the extrusion of irrigant.

**Manual agitation techniques**

By far the most common and conventional set of irrigation techniques, manual irrigation involves dispensing of an irrigant into a canal through needles/cannulae of variable gauges, either passively or with agitation by moving the needle up and down the canal space without binding it on the canal walls. This allows good control of needle depth and the volume of irrigant that is flushed through the canal. 9,63 However, the closer the needle tip is positioned to the apical tissue, the greater the chance of apical extrusion of the irrigant. 9,63 This must be avoided; were NaOCl to extrude past the apex, a catastrophic accident could occur. 9

**Manual-dynamic irrigation**

Manual-dynamic irrigation involves gently moving a well-fitting gutta-percha master cone up and down in short 2-5mm strokes within an instrumented canal, thereby producing a hydrodynamic effect and significant irrigant exchange. 70 Recent studies have shown that this irrigation technique is significantly more effective than automated-dynamic irrigation and static irrigation. 9,10,71,72

**Machine-assisted agitation systems**

**Sonic irrigation**

Sonic activation has been shown to be an effective method for disinfecting root canals, operating at frequencies of 1-6kHz. 9,73 There are several sonic irrigation devices on the market. The Vihringe allows delivery and sonic-activation of the irrigating solution in one step. It employs a two-piece syringe with a rechargeable battery. The irrigant is sonically activated, as is the needle that attaches to the syringe. The EndoActivator is a more recently introduced sonically driven canal irrigation system. 9,75 It consists of a portable handpiece and three types of disposable polymer tips of different sizes. The EndoActivator has been reported to effectively clean debris from lateral canals, remove the smear layer, and dislodge clumps of biofilm within the curved canals of molar teeth. 9

**Ultrasonics**

Ultrasonic energy produces higher frequencies than sonic energy but low amplitudes, oscillating at frequencies of 25-50kHz.9,76 Two types of ultrasonic irrigation are available. The first type is simultaneous ultrasonic instrumentation and irrigation, and the second type is referred to as passive ultrasonic irrigation operating without simultaneous irrigation (PUI). The literature indicates that it is more advantageous to apply ultrasonics after completion of canal preparation rather than as an alternative to conventional instrumentation. 9,10,77

PUI irrigation allows energy to be transmitted from an oscillating file or smooth wire to the irrigant in the root canal by means of ultrasonic waves.9 There is consensus that PUI is more effective than syringe needle irrigation at removing pulpal tissue remnants and dentine debris. 9,10 This may be due to the much higher velocity and volume of irrigant flow that are created in the canal during ultrasonic irrigation.9 PUI has been shown to remove the smear layer; there is a large body of evidence with different concentrations of NaOCl.9,10 In addition, numerous investigations have demonstrated that the use of PUI after hand or rotary instrumentation results in a significant reduction in the number of bacteria,9,10,77 or achieves significantly better results than syringe needle irrigation.9,10,77

Studies have demonstrated that effective delivery of irrigants

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to the apical third can be enhanced by using ultrasonic and sonic devices that demonstrate acoustic micro-streaming and cavitation.102-118 Acoustic micro-streaming is defined as the movement of fluids along cell membranes, which occurs as a result of the mechanical energy from the ultrasound energy creating mechanical pressure changes within the tissue. Cavitation is defined as the formation and collapse of microscopic holes and vapor bubbles or cavities in a fluid.

The Apical Vapour Lock theory, first described by Towner and clinically demonstrated in 1974, also includes the middle third by Vera: “The mixture of gases is ordinarily trapped in the apical third, but then it might grow quickly by the nucleation of the smaller bubbles, forming a gas column that might only impede penetration of the irrigant into the apical third but also push it coronally after it has been delivered into the canal.119,120” Munoz demonstrated that passive ultrasonic irrigation (PUI) and EndoVac are more effective than handpiece irrigation of a microcannula in delivering irrigant to WL of root canals.84 This begs the efficacy question. Two recently published studies examined this issue with both systems by testing their ability to eliminate microorganisms during clinical treatment from infected root canal systems.121 Paiva found that after a supplementary irrigation procedure using PUI with NaOCl that 25% of the samples produced positive cultures. Coheona’s study examining efficacy of the EndoVac found no microbial growth either after post instrumentation irrigation or at the one-week obturation appointment.

When questioning these diverge results one must remember that microbial hydrolysis via NaOCl is an equilibrium reaction. Hand demonstrated that a 50 per cent reduction of NaOCl concentration resulted in a 500 per cent reduction in dissolution activity. Accordingly, one must consider both the delivery of the irrigant to full working length, via PUI or apical negative pressure and the total volume of NaOCl exchanged. The length-time of an instrumented root canal 10mm long shaped to a #35 with a six per cent instrument equals .014 cc. Paiva described passive ultrasonic irrigation of the MacroCannula at WL - 4mm during instrumentation and discussed using PUI with #15 Kile at WL - 4mm. It is probable that NaOCl was injected into the canal; however, this could not have filled the apical four millimeters due to the apical vapour lock.

According to Munoz, the canal was most likely immediately filled with ultrasonically activated NaOCl for one minute, but as just described - only about .014 cc would have been effectively available for this exchange to occur. In contrast, the Apical Negative Pressure protocol described by Coheona et al. approximately 2ml of NaOCl actively passes through the complete WL for one minute .9 The difference in volumetric exchange equals 2/0.014 = 14,200 percent and likely explains the disinfection differential.

The plastic rotary F File Although sonic or ultrasonic instrumentation is more effective at removing residual canal debris than rotary endodontic files,119 and irrigation solutions are often unable to remove this during endodontic treatment, many clinicians still do not incorporate it into their endodontic instrument armamentarium. The common reasons given for not using sonic or ultrasonic filing are that it is time-consuming to set up, unwilling to incur the cost of the equipment, and lack of awareness of the benefits of this final instrumentation step in endodontic treatment.

It is for these reasons that an endodontic polymer-based rotary finishing file was developed. This new, single-use, plastic rotary file has a unique finish design with a diamond abrasive embedded into a non-toxic polymer. The F File will remove dentinal wall debris and agitate the NaOCl without enlarging the canal further.

Pressure-alternation devices Rinsendo irrigates the canal by using pressure- suction technology. Its components are a handpiece, a cannula with a 7mm exit aperture, and a syringe carrying irrigant. The handpiece is powered by a dental air compressor and has an irrigation speed of 6.2ml/min. Research has shown that it has promising results in cleaning the root canal system, but more research is required to provide scientific evidence of its efficacy. Periapical extrusion of irrigant has been reported with this device.10 11

The EndoVac apical negative-pressure system Although the apical positive-pressure irrigation system has three components: the Master Delivery Tip, MacroCannula and MicroCannula, The Master Delivery Tip simultaneously delivers and evacuates the irrigant (Fig. 2). The MacroCannula is used to suction irrigant from the chamber to the coronal and middle segments of the canal. The MicroCannula or MicroCannula is connected via tubing to the high-speed suction of a dental unit.

The Master Delivery Tip is connected to a syringe of irrigant and the evacuation hood is connected via tubing to the high-speed suction of a dental unit. The plastic MacroCannula has an open end of ISO size 0.15mm in diameter with a 0.02 taper and is attached to a handpiece for gross, initial flushing of the canal and mid-length parts of the root canal. The MicroCannula contains 12 microscopic holes and is capable of evacuating debris to full working length.10 11

The ISO size 0.15mm diameter stainless-steel MicroCannula has four sets of laser-cut, laterally positioned offset holes adjacent to its closed end, 100µg in diameter and spaced 100µg apart. This is attached to a finger piece for irrigation of the apical part of the canal when it is positioned at working length. The MicroCannula can be used in canals that are enlarged with endodontic files to ISO size 55.04 or larger.

During irrigation, the Master Delivery Tip delivers irrigant to the pulp chamber and apically off the excess irrigant to prevent ingress. Both the MacroCannula and MicroCannula exert negative pressure; that pulls fresh irrigating from the chamber, down the canal to the tip of the cannula, into the canal, and out through the suction hose. Thus, a constant flow of fresh irrigant is delivered by negative pressure to working length. A recent study showed that the volume of irrigant delivered was significantly higher than the volume delivered by conventional syringe needle irrigation within the same period, and resulted in significantly more debris removal at 1mm from working length than did needle irrigation.

During conventional root canal irrigation, clinicians must be careful when determining how far an irrigation needle is placed into the canal. Recommendations for avoiding NaOCl incidents include not binding the needle in the canal, not placing the needle close to working length, and using a gentle flow rate when using positive-pressure irrigation.110 With the EndoVac, in contrast, irrigant is pulled into the canal at working length and removed by negative pressure. Apical negative-pressure has been shown to enable irrigants to reach the apical third and help overcome apical vapour lock.10 11

In addition, with respect to isthmus cleaning, although it is not possible to reach and clean the isthmus area with instruments, it is not impossible to reach and thoroughly clean these areas with NaOCl when the method of irrigation is safe and efficacious. In studies comparing the EndoActivator,106 passive ultrasonic,107 the F File,111 the manual-dcymax-F Probe (DENTSPLY Rinn),109 the Pressure Ultrasonic111 and the EndoVac,106 only the EndoVac was capable of cleaning 100 per cent of the isthmus area.

After being unable to avoid air entrapment, the EndoVac system is also advantageous in its ability to deliver irrigants safely to working length without causing their undue extrusion into the periapex109 thereby avoiding NaOCl incidents. It is important to note that it is possible to create positive pressure in the pulp canal when the Master Delivery Tip is misused, which would create the risk of a NaOCl incident. The manufacturer’s instructions must be followed for correct use of the Master Delivery Tip.

Sodium hypochlorite incidents Although a devastating endodontic NaOCl incident is rare,10 the cytotoxic effects of NaOCl on vital tissue are well established.107 The associated sequelae of NaOCl exposure have been reported to include threatening airway obstructions,110 facial disfigurement requiring multiple corrective surgical procedures,111 permanent parasthesia,107 loss of facial muscle control,107 and the least significant consequence - tooth loss.107

Although the exact aetiology of the NaOCl incident is still uncertain, based on the evidence from actual incidents, it is likely that the use of the associated tissue trauma, it would appear that an intravenous injection may be the cause. The clinical significance of which is that it is possible to reach and clean the isthmus area with instruments, it is not impossible to reach and thoroughly clean these areas with NaOCl when the method of irrigation is safe and efficacious.

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Safety first In order to compare the safety of various intra-canal irrigation delivery devices, an in vitro test was conducted using the worst-case scenario of apical extrusion, with neutral atmospheric pressure and an open apex.12 The study concluded that the EndoVac did not extrude irrigant after deep intra-canal delivery and suctioning of the irrigant from the chamber to full working length, whereas other devices did. The EndoActivator extruded only a very small volume of irrigant, the clinical significance of which is not known.

Mitchell and Baumgartner tested irrigated (NaOCl) extrusion on a tooth embedded in permeable agarose gel.11 Significant less extrusion occurred using the EndoVac system compared with positive-pressure needle irrigation. A well-controlled study by Gondim et al. found that patients experienced less post-operative pain, swelling, and ecchymosis around the eye, could only have occurred if the NaOCl had been introduced intravenously to a vein close to the root apex through which extrusion six, seven, eight, nine, ten, eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen, twenty, twenty-one, twenty-two, twenty-three, twenty-four, twenty-five, twenty-six, twenty-seven, twenty-eight, twenty-nine, thirty, thirty-one, thirty-two, thirty-three, thirty-four, thirty-five, thirty-six, thirty-seven, thirty-eight, thirty-nine, forty, forty-one, forty-two, forty-three, forty-four, forty-five, forty-six, forty-seven, forty-eight, forty-nine, fifty, fifty-one, fifty-two, fifty-three, fifty-four, fifty-five, fifty-six, fifty-seven, fifty-eight, fifty-nine, sixty, sixty-one, sixty-two, sixty-three, sixty-four, sixty-five, sixty-six, sixty-seven, sixty-eight, sixty-nine, seventy, seventy-one, seventy-two, seventy-three, seventy-four, seventy-five, seventy-six, seventy-seven, seventy-eight, seventy-nine, eighty, eighty-one, eighty-two, eighty-three, eighty-four, eighty-five, eighty-six, eighty-seven, eighty-eight, eighty-nine, ninety, ninety-one, ninety-two, ninety-three, ninety-four, ninety-five, ninety-six, ninety-seven, ninety-eight, ninety-nine, one hundred, one hundred and one, one hundred and two, one hundred and three, one hundred and four, one hundred and five, one hundred and six, one hundred and seven, one hundred and eight, one hundred and nine, one hundred and ten, one hundred and eleven, one hundred and twelve, one hundred and thirteen, one hundred and fourteen, November 2013
In vitro and in vivo studies have demonstrated greater removal of debris from the apical walls and a statistically cleaner result using apical negative-pressure irrigation in closed endodontal systems with sealed apices. In an in vivo study of 22 teeth by Siu and Baumgartner, less debris remained at 1mm from working length using apical negative pressure compared to use of traditional needle irrigation, while Shim et al., found in an in vitro study of 69 teeth comparing traditional needle irrigation with apical negative pressure that these methods both resulted in clean root canals, but that apical negative pressure resulted in less debris remaining at 1.5 and 5.5mm from working length.115,116

When comparing root canal debridement using manual-dynamic agitation or the EndoVac for final irrigation in a closed system and an open system, it was found that the presence of a sealed apical foramen adversely affected debridement efficacy when manual-dynamic agitation was used, but did not adversely affect results when the EndoVac was used. Apical negative-pressure irrigation is an effective method to overcome the fluid-dynamic challenges inherent in closed root canal systems.117

Microbial control
Hockett et al. tested the ability of apical negative pressure to remove a thick biofilm of E. Faecalitis, finding that these specimens rendered negative cultures obtained within 48 hours, while those irrigated using traditional positive-pressure irrigation were positive at 48 hours.118

One study found that apical negative-pressure irrigation resulted in similar bacterial reduction to use of apical positive-pressure irrigation and a triple antibiotic in immature teeth.118

In a study comparing the use of apical positive-pressure irrigation and a triple antibiotic that has been utilised for pulpal regeneration/vasculatization in teeth with incompletely formed apices (Trimix = Cipro, Minocin, Flagyl) versus use of apical negative-pressure irrigation with NaOCl, it was found that the results were statistically equivalent for mineralised tissue formation and the repair process.119 Using apical negative pressure and NaOCl also avoids the risk of drug resistance, tooth discoloration, and allergic reactions.119,120

Conclusion
Since the dawn of contemporary endodontics, dentists have been striving NaOCl into the root canal space and then proceeding to place endodontic instruments down the canal in the belief that they were carrying the irrigant to the apical termination. Biological, scanning electron microscopy, light microscopy, and other studies have proven this belief to be in error. NaOCl reacts with organic material in the root canal and quickly forms micro-bubbles at the apical termination that coalesce into a single large apical vapour bubble with subsequent instrumentation. Since the apical vapour lock cannot be displaced via mechanical means, it prevents further NaOCl flow into the apical area. The safest method yet discovered to provide fresh NaOCl safety to the apical terminus to eliminate the apical vapour lock is to evacuate it via apical negative pressure. This method has also been proven to be safe because it always draws irrigants to the source via suction - down the canal and simultaneously away from the apical tissue in abundant quantities.120 When the proper irrigating agents are delivered safely to the full extent of the root canal terminus, thereby removing 100 per cent of organic tissue and 100 per cent of the microbial contaminants, success in endodontic treatment may be taken to levels never seen before.121

Editorial note: A complete list of references is available from the publisher. This article has been reprinted in part from G. Glassman, Safety and Efficacy Considerations in Endodontic Irrigation (PenHill, January 2011).

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About the author
Dr Gary Glassman graduated from the University of Toronto Faculty of Dentistry in 1984 and graduated from the Endodontology Program at Temple University in 1987, where he received the Louis I. Grossman Study Club Award for academic and clinical presentations. He is the author of numerous publications, he lectures globally on endodontics and is on the staff at the University of Toronto Faculty of Dentistry in the Graduate Department of Endodontics. He is a fellow of the Royal College of Dentists of Canada, and the endodontic editor for the Oral Health Journal. He maintains a private practice, Endodontic Specialists, in Toronto, Ontario, Canada. He can be reached through his website, www.rootcanals.ca
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Dr. Robert Teeuwen - A Practitioner of Endo Techniques according to Sargenti

How did you learn about N2?
During my years of study at the University of Bonn, Germany (May 1959 – February 1965) N2 was the preferred root canal filling material of the dental clinic.

When assisting in my father’s dental practice I used to work with N2 as well – occasionally replaced by Endomethasone, Riebler and Diaket.

Since when have you been familiar with the method developed by Dr. Sargentii?
I first learned about the Sargentii method in the years 1968 – 1970. This method convinced me as it is efficient and time-saving, which was very convenient for me as I had opened my own dental practice in July 1969 and never knew how to cope with the heavy patient traffic. So I was forced to think about measures to work efficiently – not only in endodontics. From April 1972 I worked with an assistant according to my instructions. Since the day...
of opening my practice, all of mine and the assistant’s dental treatments have been recorded. All of these practice diaries do still exist, however, the patient’s file cards are no longer complete. So I was able to count the number of endodontic treatments.


My assistants who asked me for contact. He gave me quite a short shrift at his doorstep. In the year 1990, it was Dr. Sargenti who asked me for contact. He had suffered from a stroke and was in need of help. He knew that I had done a lot of endodontic treatment with N2 never ends up in pain, including endodontic treatment of deciduous teeth.

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treatments and due to this experience he asked me to represent the N2 method in German speaking countries. After I had studied the endodontic scientific literature, prepared a lecture in English and presented ump-teen treatment cases to the AES (American Endodontic Society– professional association of N2 users in the US), Sargenti paid for my trip to an AES session in the United States, where I received the “fellowship”. After presentation of yet another lecture I received the comment of the audience: “This case was the best of the thirty I had treated the title of “master-ships”.

My mentioning of more than 10,000 treatments does not necessarily mean that they all met high quality standards. Root canal treatment of molars was quite in disorder. Until mid of 1985, however, X-ray control directly after root canal treatment was only done in exceptional cases, so we did not know what we were doing. Consequently, frequent failures due to poor root filling quality could be observed after years. At least this proved that the Sargenti method does not necessarily protect against failures due to poor root filling quality. In case of heavy overfilling, I prophylactically made a “Schroeder Aeration” (= artificial fistulation). In most of the cases, gangrenous teeth could also be treated in one appointment. In case of short root filling, I finished treatment by apectomy; the other teeth were treated by trephination.

Whether apectomy or trephination 2 – treatment has to be done efficiently without much fumbling to avoid subsequent problems. Acute exacerbations do very rarely occur after apectomy/trephination. I occasionally treated a “via falsa” with perforation and N2 leakage into the bone successfully by fistulation as well. I use the expression “occasionally” as this had only very rarely, thus there had been little chance to do the therapy. Basically I regard the perforation area as an artificial foramen, a foramen not belonging here.

In few cases, I tried Diaket out as root filling material with following fistulation. Treatment is also successful with Diaket, however, I mind that it doesn’t pour off the lentulo the perfect way N2 does. Ithardens as fast as N2, though. Root filling was followed by a possible apectomy/fistulation after 20 minutes. I also know surgeons who use either N2 or Diaket.

What does the N2 method comprise?
• No canal rinsing
• Use of the reamer as sole root canal instrument

Rubberdam for safety’s sake for manual manipulations only
• Use of the strongly antimicrobial N2 as root canal filling material (the powder contains five per cent formaldehyde, EU approval as medical device 6/1996)
• Root canal treatment in one appointment is the goal (no problem in vital teeth, in non-vital teeth with reservation – in the latter case definitely complete reaming during the same appointment). Alternatively in one appointment finished by “Schroeder Aeration”. According to Sargenti, the “Schroeder Aeration” comprises a wide treatment spectrum: pain prophylaxis is during root canal treatment of non-vital teeth in one appointment plus after overfilling of vital teeth roots, apart from that for pain therapy
• According to Sargenti, point condensation of the root filling is not necessary, however, it looks better on X-ray

What do you think about the frequently discussed ingredient formaldehyde: Systemic distribution in the body according to literature?
There is only an ambivalent answer to this question. The Block study with dogs as test animals circulates in literature. First of all, it has to be made clear that results from animal experiments cannot simply be adopted for humans due to different metabolisms. So formaldehyde features different half-lives in different animal species. In humans, half-life of formaldehyde amounts to 1 – 1.5 minutes. In an N2 court hearing in the US, the former leading US toxicologist Brent stated that the results of the Block study had been misinterpreted. Due to the short half-life, formaldehyde had no longer bonded to marker C14. Correctly, the systemic distribution of C14 in the organs had been detected, however no formaldehyde. At this point, I also wish to criticise laboratory tests (in vitro). An adoption of animal results has to be judged sceptically as the enzymes of the living organism are missing.

Have you ever experienced intolerances or allergic reactions to N2 in your practice?
I have never seen an immediate or time-delayed allergic reaction against N2. However, the patients who had been provided with N2 root fillings, actually do suffer from formaldehyde allergy. Surely the use of N2 has strongly been decreasing for years, which cannot be only attributed to the statements of the Sargenti publications but is also caused by the variety of new products. Each and every new technique and promoted root canal filling material on the healthcare market claims to offer a sophisticated and very high quality material as the patients’ and practitioners’ interest. Could you ever blame your colleagues for taking hold of the new products?

Have you ever observed bone or gingival necrosis after the use of N2?
I had to diagnose a gingival necrosis only after following Sargenti’s proposal to put an N2-soaked stripe of tamponade into the gingival pocket.

Publications:
Schröder, K. (1984). Schmerztherapie der Nervus alveolaris inferior durch überfüllte Wurzelkanalfüllungsmaterialien. Endodontology #4; 1999: 323-336; Endodontology #4; 1999: 325-356; Schröder, K. (1985). Influence of clinical factors”. As dental technology had progressed strongly within the last 40 – 50 years, a higher probability of success could have been expected. Endodontists, however, deny this non-increase stating that they are treating more risky endodontic cases now.

I’d like to add that the AES has in vain struggled to obtain N2 approval by the FDA (Food and Drug Association, responsible for approval of medical devices) for many years now. It is not a comfort for the local N2 users that so far also no other root canal filling material obtained an approval. It is shameful that hundreds of X-ray photos requested by the FDA could not be relocated by the FDA.

Is there any evidence of cancerogenity or mutagenicity from your point of view?
Cancerogenity or mutagenicity could not have been proven by now. However, formaldehyde has been classified as human carcinogen some years ago, i.e. for pharyngeal tumor after several years latency, Cancerogenity or mutagenicity have been presented convincingly by overfilling with root canal filling material. As dental technology has progressed strongly within the last 40 – 50 years, a higher probability of success could have been expected. Endodontists, however, deny this non-increase stating that they are treating more risky endodontic cases now.

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With nearly half of UK adults (45 per cent) unhappy with the alignment of their teeth, it’s no surprise that orthodontic treatment is on the rise. Interestingly, the YouGov survey conducted on behalf of National Orthodontic Week (NOW) in 2010, also found that 20 per cent of respondents would consider having some form of orthodontic treatment. That’s quite a drop. From 45 per cent of people being unhappy with the way their teeth look to just 20 per cent being prepared to do something about it. Now, why could that be? There are two main issues that discourage patients from seeking treatment: cost and embarrassment of the way it would make them look, but both of these matters can be dealt with very easily. As demand for adult orthodontic treatment continues to grow, so too does the development of new products and techniques to meet that need.

Celebrities such as Tom Cruise, Nicolas Cage and Katherine Heigl have all shown that orthodontics is not just for children. However, although they have effectively been ambassadors for adult orthodontics (simply by undergoing treatment and being photographed wearing braces), there is also the suggestion that treatment for the stars is likely to be too expensive for the general public. In actual fact, there are a number of treatment options to choose from, ranging widely in price. Fear of embarrassment is another key issue for patients, but modern treatments are incredibly subtle. It’s no longer necessary for patients to endure conspicuous metal ‘train tracks’ on the front of their teeth. Innovations in adult orthodontics have led to treatment such as understated tooth-coloured fixed braces, or lingual braces that are fitted to the back of the teeth, or even removable clear aligners.

Perhaps the patient is worried about broaching the subject with you in case they are judged to be ‘making a fuss over nothing’, assuming that you would tell them if their un-
even teeth needed treatment. Or they may be afraid of experiencing pain. These obstacles, and indeed many more, to treatment can be overcome by developing effective patient communication and education.

The first and most obvious benefit to orthodontic treatment is a more attractive appearance and greater confidence. And this enhances every aspect of a person’s life from their career prospects to their personal relationships. In addition to this, there are the health implications. Optimum dental function reduces teeth grinding and ensures that food is chewed properly, helping the patient’s digestion of meals and snacks. Some patients with severe malalignment may even feel they have to avoid certain types of food and so, following treatment, are able to enjoy a wider variety of nourishment and the health benefits of an improved nutritional intake.

Straight teeth are much easier to clean than those that are crowded, as a toothbrush can reach more of the surface area of each tooth. The interproximal areas can also be accessed effortlessly, allowing cleaning with floss or interdental brushes. If the patient lacks adequate spacing such cleaning proves difficult and leads to inefficient hygiene, or the patient gives up altogether out of sheer frustration. In all probability, patients with crooked teeth will have more plaque build up and are at greater risk of gingivitis and tooth loss.

Improving teeth alignment also balances the force of the bite more evenly. With a crooked dentition, some teeth are taking more of the force than others, creating problems such as uneven wear and even causing headaches or jaw pain.

Patients who feel they are saving money by avoiding orthodontic treatment now might be heading for much more expensive dental procedures later in life.

If you are thinking about referring orthodontic treatment for your patients, contact a referral practice with the necessary expertise such as the London Smile Clinic, and discover the best treatment options available for each individual case. Led by Specialist Orthodontist Dr Preet Bhogal, the clinic develops close working relationships with referring dentists to ensure the best possible patient care for the whole duration of the referred treatment. From the initial assessment to the day the braces come off, the clinic seeks authorisation and approval from the referring dentist at every stage.

Effective orthodontic treatment delivered by a specialist dramatically improves patients’ lives. Consider it from their perspective. A GDP might see what appears to be a very minor case of uneven dentition and not think it worth referring. The patient, on the other hand, looks in the mirror every day and notices every perceived flaw. To the patient, achieving straighter teeth is nothing short of a transformation. Just imagine how patients with very crooked teeth would feel if they had the opportunity to gain a more beautiful smile. That power lies in your hands.
On 8 October, 1971 John Lennon released his mega-hit ‘Imagine’. The incredible lyrics prompted the listener to imagine a world at peace without divisiveness and barriers, and to consider the possibility of living a life of a brotherhood of man. Without any doubt, everything good that happens in the world on a life of a brotherhood of man. Imagine all the People, Sharing All the World.

The philosophy of ICE is to provide local support and teamwork through a structured continuum of education and training for those seeking to develop clinical skills in this field from treatment planning to restorative and surgical aspects of implant dentistry.

Collaborative professional development and training (CPDT) is a revolutionary approach to CPD training and education in implant dentistry. ICE provides the support, interaction and education needed to get involved. It does this through structured long term support and learning for the whole team providing training at every level of clinical practice.

The support comes from ICEa through a mobile app/interface. This offers treatment guidelines, protocols, discussion forums, instant access to a range of experts, and discount schemes with industrial partners. ICEa provides complimentary restorative kits, instruments, patient literature and consent forms as well as regular regional treatment planning study club meetings.

ICE provides excellent clinical facilities and access to best implant systems including Straumann and Astra/Dentsply and for the educational body (ICEi) provides the platform for collaborative teaching and learning to benefit all concerned. Participants are encouraged to pursue a structured continuum of education and training from restoring few implants to postgraduate programmes such as MSc in implant dentistry.

Champagne reception and trade fair. Sponsors Straumann, Geistlich and Astra explained how using well resourced, evidence-based products is essential to predictable long-term aesthetic success – a fundamental concept to ICE philosophy.

This was the first in a series of four lectures that will cover the essentials of implantology. With this knowledge the team may then go on to the ICE Restorative series in which they will be provided with the skillset and support to begin to restore implants in their own practices progressing from straightforward to advanced cases with safety and confidence.

The Implant Centres of Excellence or ICE, is the brainchild of three of the UK’s most experienced implant educators and clinicians; Prof Cemal Ucer, Simon Wright and David Speechley. ICE consists of three separate groups: regional ICE clinics to provide clinical treatment and support to referring practitioners; the ICE Association (ICEa) providing peer interaction and support; and the backbone of the organisation, the Institute (ICEi) providing structured, accredited clinical training and education to team members at all levels. At the backbone of ICEs is the newly launched member school which will provide systematic patient-centred supervised clinical training at ICE central hub and regional clinics.

The event started with a trade fair. Sponsors Straumann, then go on to the ICE Restorative series in which they will be provided with the skillset and support to begin to restore implants in their own practices progressing from straightforward to advanced cases with safety and confidence.

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ICE Foundation Course for GDPs
The Royal College of Physicians London
March 28th 2014

Presenters
Professor Frank Schwarz
Dr Michael Norton
Dr Stephen Barter

Germany United Kingdom Edition
United Kingdom Edition

Advanced techniques for membrane use in modern bone and tissue regeneration
The Royal College of Physicians London
March 28th 2014

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Professor Frank Schwarz
Dr Michael Norton
Dr Stephen Barter

Contact Info
Tel: Steph Littler 0151 709 1714 or visit www.icedentalimplants.co.uk

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Leading regeneration
Philips saves lives too
Philips is a diversified health and wellbeing company which is focused on improving people’s lives through meaningful technological innovation. Whilst most dental professionals will be familiar with our range of software products – from Sirona to Curaprox, Carestream's iCOSMO is an accurate and cost-effective solution for implant dentistry. Its award-winning HeartStart Defibrillator Series are now being made available directly to dental practices to enable anyone in the team to treat sudden cardiac arrest quickly and effectively as soon as it has occurred. The Philips/HeartStart Defibrillator is believed to be the first device on the market designed to specifically treat cardiac arrest in dental clinics.

HeartStart Defibrillators

All Round Quality from Carestream Dental

"We use a lot of the software and technology available from Carestream Dental within our practice, prior to the quality of the equipment and the customer service provided." Chris Groombridge, Principal Dentist of 543 Dental Centres Group, London

About Carestream Dental

Caruson

84 Online Backup and Recovery

So you can support – when you need it most

A burst water main in Herne Hill... a high street in London, recently caused chaos as the water had to be turned off. The support team at Caruson Dental were able to provide three new computers pre-loaded with all the practice's patient files.

"The support we’ve received from Carestream Dental really has been excellent," continues Dr. Patel. "We’ve been extremely well supported by the team at Carestream Dental. They have helped us get through a very difficult time."

For more information, please contact Caruson Dental on 0800 169 9692 or visit www.carusondental.co.uk

Zesty – Taking the bites out of booking

Zesty… it’s quick – it’s online – it’s easy!

Zesty is the new online booking system that Zesty’s lifestyle has been designed to make it easier for dental practices to offer easy access to patients looking to book appointments online. Zesty offers a comprehensive booking solution for dental practices across the UK, and can accommodate all aspects of appointment booking.

Zesty is easy to use, reliable and offers a seamless experience for patients, with the added benefit of being easy to set up and use.

"Zesty is an easy-to-use, user-friendly system that makes booking appointments easy for our patients. We found the integration with our other systems seamless and the support provided by the customer services team was excellent. We would not hesitate to recommend Zesty to any dental practice looking to improve their appointment booking process."

Simply email: hello@zesty.co.uk or visit www.zesty.co.uk or call 0203 287 5416 for more details of our Free Trial

Philips Sonicare and Philips Zoom

Philips SoniCare toothbrushes and Philips Zoom Whitening have long been popular with celebrities, and in recent weeks a number of these individuals have taken to Twitter to share their experiences.

"I have been going to the dentist for a while now and that celebrity recognition can take a patient from relative obscurity to national recognition. This can have an almost knock-on effect for businesses selling these products or services. For example, if you were to visit a celebrity who has had their teeth whitened, they are likely to be asked about the products they have used. This is an easy way to increase a potential customer base.

"The product has been received to great reviews and feedback. The Philips SoniCare toothbrushes offer a number of different modes and settings to suit everyone’s needs. This makes it easy for users to adapt the defibrillator’s instructions to the users actions, conducting them calmly through the sequence they need to follow. Because patient safety is imperative, many practices – particularly those which carry out surgery and offer sedation - are changing with these Phillips SonicSurg insulin management systems. This allows dentists to direct patients to book appointments online and measure patients’ reactions to medications and treatment.

For more information please visit www.philips.co.uk/healthcare

The Hydrasonic Electric Toothbrush leads the way

A new era in toothbrushing has begun with the innovative Hydrasonic Electric Toothbrush, developed by leading Swiss oral healthcare expert Carestream Dental. No other toothbrush on the market can compete with its incredible 42,000 sonic wobbling strokes per minute. An intense hydrodynamic effect is created when the circular oscillatory motion of the toothbrush combined with water, toothpaste and saliva. Plaque is removed easily and quickly and the toothbrush is extremely easy to use.

"Working with Karl has helped us focus on associate profitability and provided more in depth training with regards to the use of the technology. It has been a fantastic help. He also provided a list of areas to look at and improve, in order to enhance our productivity and income. "Working with Karl has helped us focus on associate profitability and provided more in depth training with regards to the use of the technology. It has been a fantastic help. He also provided a list of areas to look at and improve, in order to enhance our productivity and income."

From the innovative Caruson Dental’s patient portal, to the大街上的 THREE VISIONS – Professional, Honest and Hardworking

Lorraine Wilkinson is the practice manager at Progressive Dentistry in Fulham. She and her team recently eradicated the business expertise of Karl Taylor Knight from the practice.

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DMG UK

See the Linda Greenwal video on DMG UK’s website

Icon is DMG UK’s revolutionary treatment for incipient caries and carious white spot lesions... without drilling! To find how Icon can enhance your practice and introduce a new revenue stream watch the Linda Greenwal video on DMG UK’s website dmg-dental.com. Link the link to dmg-dental.com/products/caries-infiltration/icon/products/caries-infiltrant-smooth-surface-surface

Icon is an innovative caries infiltration therapy. It represents a breakthrough in micro-invasive technology that reinforces and stabilises demineralised enamel without the need for drilling or sacrificing healthy tooth structure. The first step is to bridge the gap between the previous ‘wait and see’ approach and the absolute minimum disruption. Overall, both RPA Dental and Tavom provided practical advice on material quality, colour schemes and relevant clinical indications. Throughout the two days, we managed to see the design options with several members of our practice team, not just the lead clinician. The CB12 effect

For more information about CB12 and how it could benefit your patients, please visit www.rogergullidgedesign.com

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From Healthcare Learning:

Broaden your skills with an RFS in Endodontics

From EndoCare Learning: Smile-on: Whether you want to enhance the patient service you provide, help your practice grow, or become a better clinician, Healthcare Learning ‘Smile-on’ has a solution for you. The latest qualification available from the leading education provider is an RFS in Endodontics. Designed as a two-year, part-time blended learning course, tuition is delivered through a combination of webinars, face-to-face instruction and hands-on sessions, with vast online resources accessible throughout. Taking you from the simple and modern techniques in dentistry, through to the latest clinical implications, research methods and practical guidance, the course covers all aspects of endodontic treatments. At the end of the course, you will receive a certificate of attendance from our experienced tutors, who will have provided you with over two years, offering additional advice and guidance when you need it. To apply all you need is two years endodontics experience. For more information, or to apply please call 0207 809899 or email info@healthcare-learning.com

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The CB12 effect

Don’t be surprised if you find that more and more of your patients ask about CB12 mouth rinse in the next few months.

That will be the effect of a nationwide TV campaign airing from November to December, which highlights the product is now even more accessible for patients to anyone. “For more information call Tavom UK on 0870 752 1121 or visit www.tavom.co.uk”

www.dmg-dental.com

www.dmg-dental.com. Follow the link uk.dmg-dental.com/spot-lesions... without drilling! To find out how Icon can enhance your Practice and introduce a new revenue stream watch the Linda Greenwal video on DMG UK’s website dmg-dental.com. Link the link to dmg-dental.com/products/caries-infiltration/icon/products/caries-infiltrant-smooth-surface-surface

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