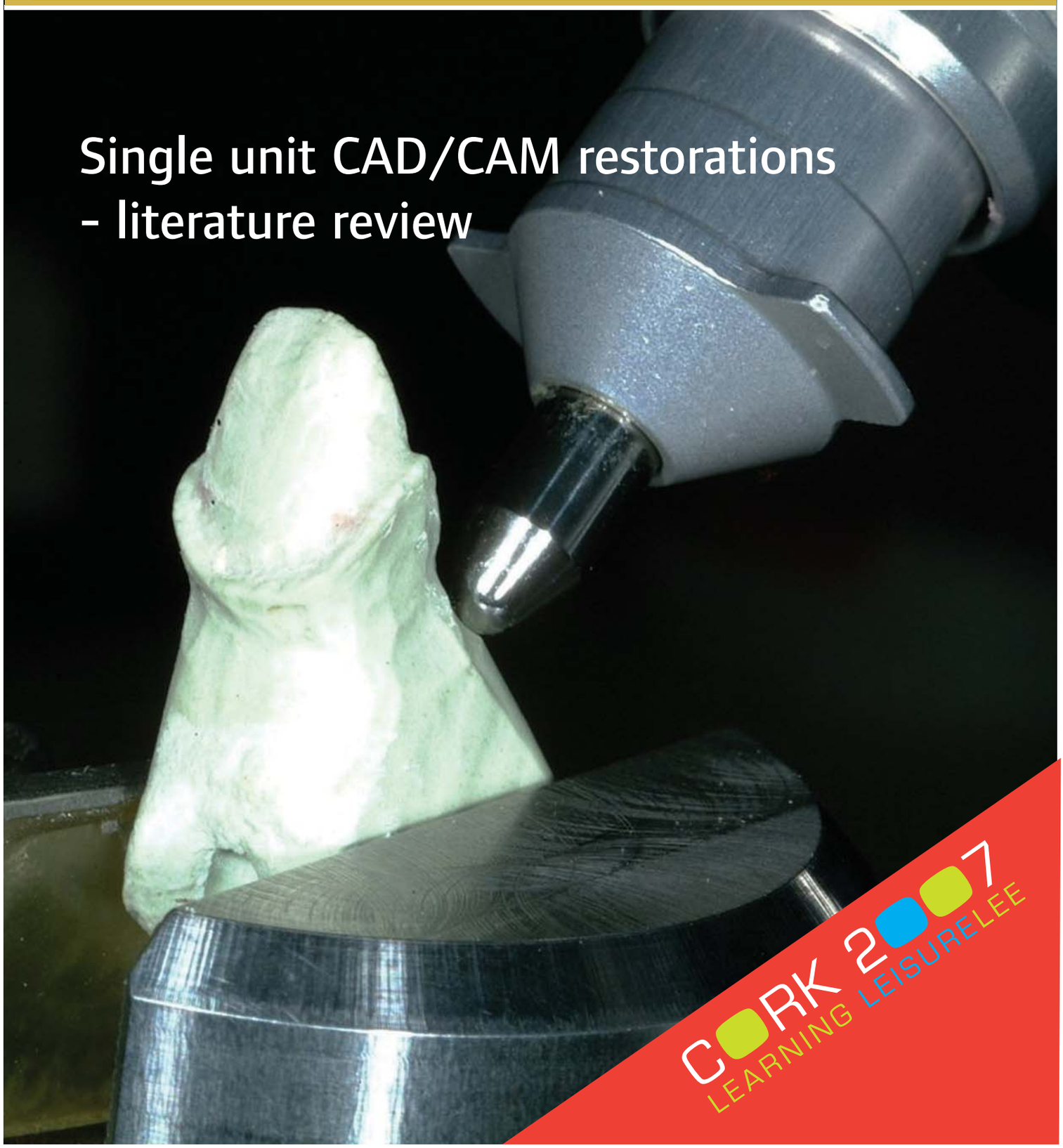
Volume 53 Number 1 Spring 2007

IDA
irish dental association

Journal of the Irish Dental Association

Iris Cumainn Déadach na hÉireann

Single unit CAD/CAM restorations - literature review



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Reference 1. In press: *Caries Research* 2006; 40(4): Abstract.

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The Journal of the Irish Dental Association
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For advice to authors, please see: www.dentist.ie/resources/jida/authors.jsp

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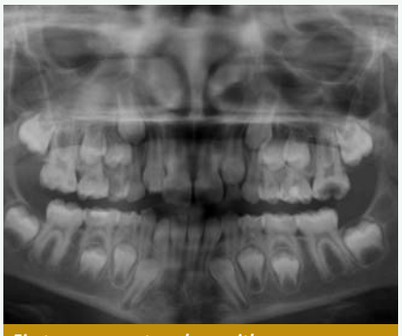

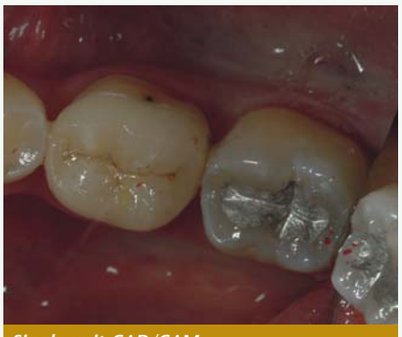

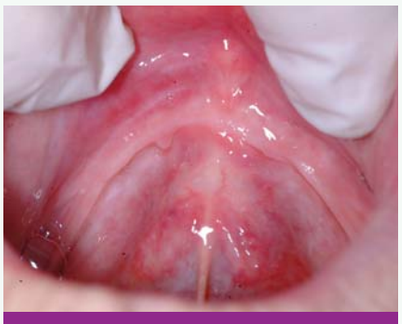

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EDITORIAL

Increasing our knowledge and highlighting our difficulties

This year's Irish Dental Association Annual Scientific Meeting is in Cork from April 18-21, under the Presidency of Dr John Barry and we hope to see you all there. There is an excellent programme, highlighting the controversial area of the implant versus the root filled tooth, practical everyday problems, and forensic dentistry and its importance to us as dentists.

Time to highlight problems

There is an election pending, and now is the time to highlight the problems that our patients face with our 'potential representatives'. National Dental Health Week in 1979 led to the distribution of 550,000 toothbrushes to children in National Schools (JIDA 1980 44-47). Maybe in 2007, we could highlight our 'Irish Dental Association/Colgate Oral Health Month' and ask our politicians to support the concept that every patient over 40 should have a funded oral cavity and neck examination to rule out the possibility of mouth cancer or other oral/dental pathology. Research indicates that the mouth cavity is not routinely examined by the medical practitioner (25%). O'Sullivan (*Eur. J. Cancer Oral Oncology* 2001; 37 (Suppl.1): S49), *JOMS* 2004; 62 (1):115, and a 2005 HSE Audit highlighted the fact that although dentists should be very good at identifying this disease, many patients were edentulous and did not attend or the disease was far advanced on referral by the dental or medical practitioner.

Dental tourism issues

It is recognised that patients have the freedom to go where they want for dental treatment. There are more and more overseas consultations occurring in Ireland. Do we or the Government have a duty to advise patients and voters of the potential risks? We have an ethical dilemma. What do we do when the patient returns from a 'tourist dentist visit', following advanced and often complicated and expensive dental treatments, and develops a problem? Are we responsible? Tom Feeney tries to address this issue in the European section and I look forward to your letters.

Scientific knowledge

Papers for the Spring Edition of the Journal include the important topic of hypomineralisation of incisors and first permanent molars (MIH), the need for early diagnosis, the importance of preventive measures, and restorations from the composite restoration to full crown coverage or extraction.

A review of the literature on the application of computer aided design/computer aided manufacture (CAD/CAM) to single unit dental restorations is reported. It highlights the advantages, and although the procedure/manufacture, following initial costly outlay, is cost effective and patient efficient, there is a need for further long-term research.

An audit of orthodontic referrals using the index of orthodontic treatment highlights that completing the audit cycle does work and can be used to improve how we deliver a service. The paper also highlights that although the HSE guidelines are being followed, there is no real measurement of the actual orthodontic needs of the groups studied.

Journal progress

Thank you again for all your scientific contributions and also to Th!nkMedia, who are doing an excellent job making the Journal more readable, more presentable and an effective vehicle for promoting the IDA image. Again, we could not do the scientific work without the reviewers, who are very many, unsung and the Editorial Board are grateful for your time, effort and support.

Leo F. A. Stassen

Prof. Leo F. A. Stassen
Honorary Editor

PRESIDENTIAL NEWS

New year, new challenges

The Association has been very busy over the past couple of months, in particular with government negotiations, meetings with the HSE and Professor Drumm and strategic political lobbying in the run up to the general election. IDA House is well organised and ready to face the many challenges the next few months will bring and I urge members to support their Association.

Negotiations with HSE

As you are aware, the Review of the Dental Treatment Services Scheme (DTSS) was due to conclude in January. At a DTSS Review meeting on January 10 last, the HSE informed the Irish Dental Association that they had received a legal opinion that the negotiation of professional fees with representative bodies such as the IDA may not be permissible under the Competition Act, 2002. On foot of this opinion, all negotiations between the IDA and the HSE to produce a new DTSS contract have now been cancelled pending legal clarification from the Attorney General's office.

The Irish Dental Association is extremely concerned that access for medical cardholders to dental services may be negatively affected in the absence of a speedy resolution to this latest impasse in the DTSS Review.

This latest tactic by the HSE to postpone the conclusion of the DTSS Review (which is six-and-a-half years overdue) is being cynically viewed and is seen as an attempt to undermine the position of the Association and its members. It goes to the heart of the IDA's ability to represent the interests of our members, and if persisted with, will have profound implications for the wider public sector. IDA will be monitoring progress in this situation very closely and are keeping members updated accordingly, not least through the recent series of Branch meetings across the country.

Chief Dental Officer vacancy

The continued failure to appoint a Chief Dental Officer (CDO) at the Department of Health and Children (a position which has remained vacant for the past two-and-a-half years), is leading to a worsening crisis in the provision of publicly-funded dental health as there is nobody in the Department of Health planning future oral health strategy. This issue was raised at the IDA AGM in December and articles on the topic appeared in national and local publications further to a press release by IDA House. Ciara Murphy, CEO, was also invited to discuss the CDO post on the Pat Kenny radio show. Furthermore, at a recent IDA meeting with the HSE, its CEO Professor Drumm acknowledged the many negative repercussions of the CDO vacancy and asserted that he will attempt to get this issue "raised up the agenda". IDA is also in the process of briefing all politicians on this issue amongst others in dentistry.

Public relations

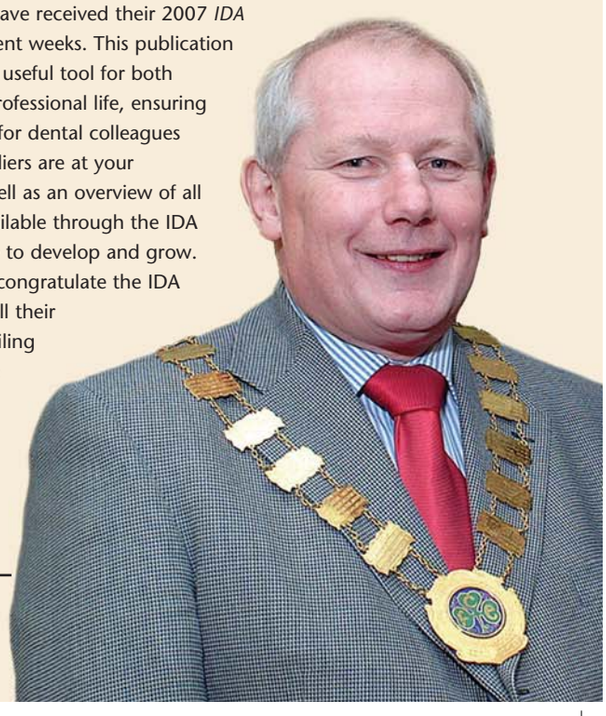
IDA has had a very successful public relations campaign over recent months. Many press releases on the varied topics of children's oral health, the CDO vacancy, dentistry as a career, cracked teeth syndrome and the IDA response to dental tourism have been picked up by both local and national newspapers and radio. The result is a positive dentistry story reaching the general public on a monthly basis. Suggestions for topics for IDA press releases are welcome and may be directed to IDA House for consideration.

Annual Scientific Conference

The welcome lengthening of daytime after a long, dark winter heralds the imminent arrival of springtime and with it the Annual Scientific Conference from April 18 to 21. Members should all have received the ASC 2007 brochure outlining the many fantastic science and social events of what promises to be a highly educational and entertaining conference. Many of the pre-conference courses are booking up fast so be sure to contact IDA House as soon as possible to add your name to the list. I look forward to welcoming you to Cork.

IDA Directory 2007

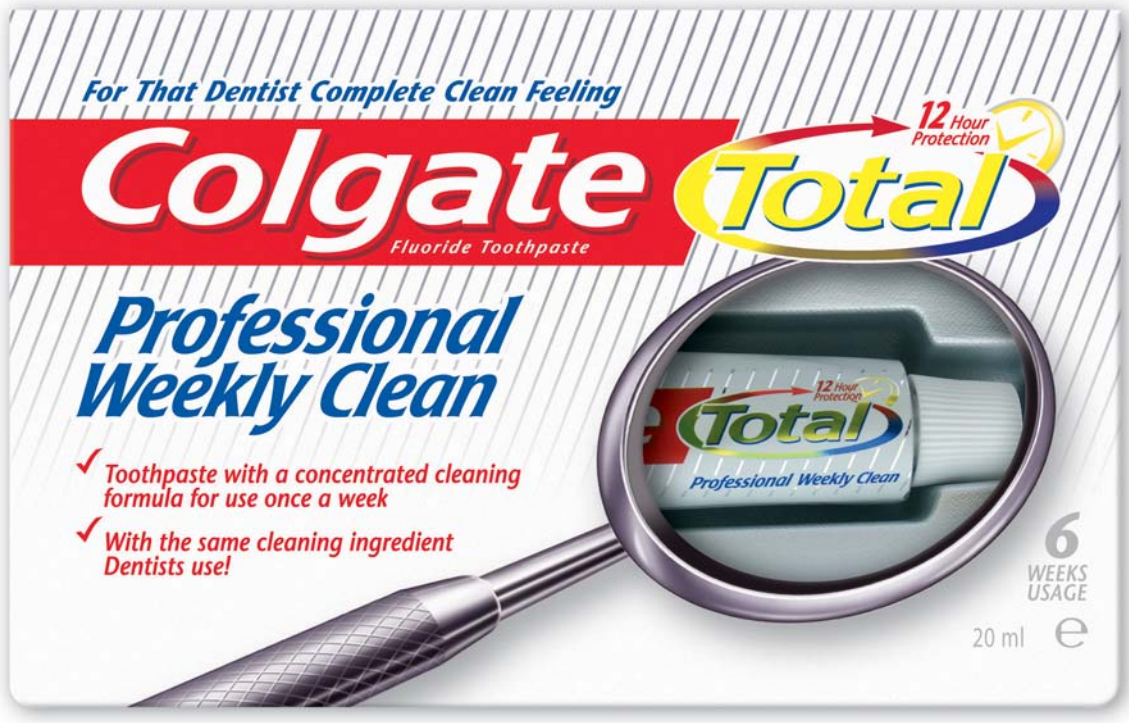
Members will have received their 2007 *IDA Directory* in recent weeks. This publication is an extremely useful tool for both personal and professional life, ensuring contact details for dental colleagues and trade suppliers are at your fingertips, as well as an overview of all the services available through the IDA which continue to develop and grow. I would like to congratulate the IDA secretariat for all their efforts in compiling this worthwhile publication.



John Barry
President

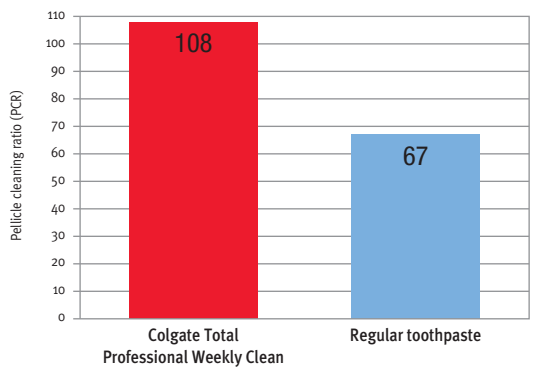
NEW

Actual size

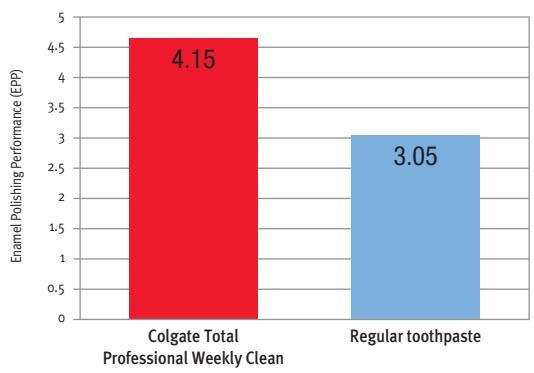


Once-weekly intensive cleaning at home

61% better cleaning[2]



36% better polishing[3]



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1. Colgate Total Professional Weekly Clean contains high cleaning silica with a Relative Dental Abrasion below the ISO standard for daily use toothpastes
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3. Measured by the Enamel polishing performance, data on file, Colgate

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Professional Weekly Clean

The once-weekly intensive clean

LETTERS

Dear Editor,
I was surprised that the article 'Vocational training in Ireland – an overview' made no reference to vocational training in the North. The Northern Ireland Medical and Dental Training Agency (NIMDTA) is responsible for the delivery of vocational training in Northern Ireland and has been doing so since 1987; for the 2007/8 training year there will be three vocational training schemes with a total of 36 trainees and a two-year General Professional Training scheme for four trainees. The schemes are robustly funded and the funding is ring fenced.
We welcome applicants from Dublin and Cork universities, and any final year student who wishes to partake of vocational training in the island of Ireland should contact NIMDTA for further details. The website is www.nimdta.gov.uk.

Yours sincerely,
Barry Mark BDS MFGDP
Adviser in General Dental Practice (Vocational Training)
Northern Ireland Medical & Dental Training Agency (NIMDTA)
Beechill House, 42 Beechill Road, Belfast BT8

Dear Editor,
In my article 'Vocational training in Ireland – an overview', I had in mind all along just to describe the scheme in the Republic. This is because as a vocational trainer in the Republic I felt I was well placed and well informed to do so. To avoid confusion, I should perhaps have specified this in the title.
Now that it has been brought to my attention, if someone from the Northern VT scheme is interested in liaising with me I would be delighted to prepare a joint article for publication. This would be very worthwhile as we could highlight the features of both schemes to better inform all dental graduates of both options on graduating.

Yours sincerely,
Louis Devereux
Briggs Lane, Arklow, Co. Wicklow

Dear Editor,
December 1, World AIDS Day, found me enjoying a most beautiful commemorative concert for the world's greatest tragedy.
The evening began with Caribbean music representing the five continents and people read accounts of their personal experiences with the virus.
One reader recalled phoning his dental surgery, being eligible on the DTB Scheme, and being told he could only have the last appointment of the day. With his experience of the appointment he detected an attitude of suspicion and unpleasantness.
Similarly, the reader visited his general medical practitioner later – when the GP placed the stethoscope on his shirt in preference to the skin for fear of contamination. The visit was unpleasant for the reader.
While these accounts were read I found myself looking at the now redundant leper balcony that is still part of the interior architecture of the Collegiate Church.

Robert Burns' lines come to mind:
Oh would it be
That God had given us
The power to see ourselves
As others see us.

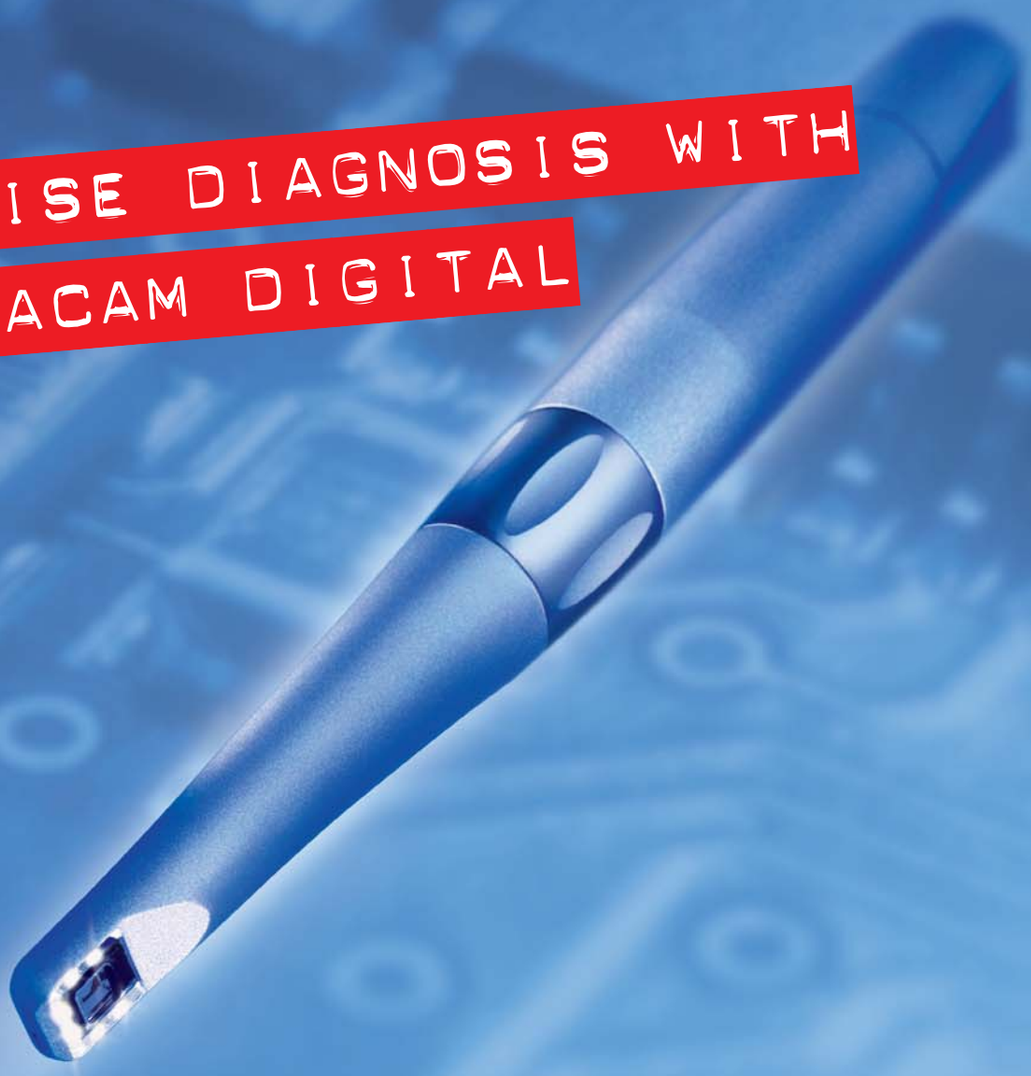
Let's recall with sensitivity, that we treat people, not teeth.

Yours sincerely,
Spailpín Fánach

Dear Editor,
I represent an Israeli-based dental company, which specialises in finding and developing unique solutions to dental problems. I have read the article concerning CTS, which was posted on January 24, 2007 on www.irishhealth.com.
We are encountering the same problems with CTS here in Israel. As is the case in Ireland, we have also experienced a boom in our economy in the last 10 or so years. Stress-related problems are becoming more and more common in our society, CTS being one of them. A couple of years ago we realised the importance of early detection of CTS.
The main cause of CTS is sleep bruxism (SB), a condition occurring during sleep causing involuntary grinding and clenching of teeth. Besides damage to dental work, other symptoms include: abnormal wearing of teeth, temporomandibular joint (TMJ) dysfunction or pain, chewing difficulties, headaches and daytime sleepiness. Research on SB found that it is significantly affected by stress.
As of now, dentists can spot patients suffering from CTS only by observing the aftermath of the syndrome – damaged teeth.
We have at our disposal a new device, which can be used for early detection of SB. The device is a disposable self-used home test to be prescribed by dentists.
This is the link to the professional site on the device, where you will be able to find all the technical data – http://www.bitestrip.com.
I am of the firm belief that it will be of interest to the dental community in Ireland.
Feel free to contact us if any questions occur.

Yours sincerely,
Ady Totah
Product Development Manager
Dencare Dental Ltd./Israel

PRECISE DIAGNOSIS WITH VISTACAM DIGITAL



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DÜRR DENTAL

ASC

All roads lead to Cork

The 2007 Annual Scientific Conference and National Trade Show of the Irish Dental Association will take place from Wednesday April 18 to Saturday April 21, 2007 at the Rochestown Park Hotel, Cork.

This year's Conference is in a revised format, running over three-and-a-half days, with five pre-conference courses on Wednesday April 18. These will be staged at the Cork Dental Hospital and the Rochestown Park Hotel, on oral surgery, oral radiology, paediatric dentistry, restorative dentistry and endodontics.

Dr Gary Glassman, a specialist based in Toronto, Canada, will give the pre-conference course on endodontics on Wednesday. Dr Michael Hartnett will assist on this course. Oral surgery and oral radiology courses take place at Cork Dental Hospital. Prof Duncan Sleeman and Dr Donal McDonnell will present these programmes. The programme will include basic surgical techniques, which will involve a hands-on laboratory-based surgical training course on raising flaps, removal of bone and suturing techniques. The radiology course will cover intra-oral radiographic techniques using paralleling instruments.

Lecture-based programmes

Two lecture-based programmes will take place at the Rochestown Park Hotel. Dr Martin Kelleher and Dr Peter Briggs will present a course on restorative dentistry, including areas such as aesthetic dentistry, tooth erosion and implants. A day course on paedontics will be conducted by Dr Kathryn Harley, Prof Richard Ibbetson, Dr Dan Counihan and Dr Paddy Fleming, which will include areas such as managing children with missing teeth, treating children with a medical history, and restorative management of hypoplastic/hypomineralised teeth.

National and international speakers

The mainstream activities of the Conference start on Thursday April 19 and include a wide range of expert national and international speakers. It will continue with the popular dedicated sessions for dental nurses, technicians and hygienists. Association President John Barry says: "I would especially ask you to encourage your dental team members to attend".

Professor David Whittaker will give some very interesting lectures on forensic dentistry throughout the programme. Professor Whittaker has been an expert witness for three decades.

Professor David Whittaker will give some very interesting lectures on forensic dentistry throughout the programme. Professor Whittaker has been an expert witness for three decades throughout the UK for both the Crown Prosecution Service and the defence. His presentation will give a fascinating insight into the relevance and importance of forensic dentistry in our world today.

Our focus on the business elements of running a dental practice will continue this year, with the entire programme on Saturday April 21 dedicated to this area. Dr Raj Rattan, a UK-based dentist, will concentrate on the marketing and commercial aspects of a dental practice. John O'Connor of Omega Financial Management will give an overview on the area of wealth management and how best to manage personal assets.

CPR refresher sessions will take place in the conference centre on Thursday and Friday. Here delegates can refresh their CPR skills and all are welcome.

Organising Committee (from left): Dr Eamonn Murphy; Elaine Hughes; Dr Martin Holohan; IDA President, Dr John Barry; Dr Maurice Leahy; Ciara Murphy; Dr Michael Hartnett; and Dr Nuala Cagney.

Impressive trade show

The IDA Annual Scientific Conference is the largest dental meeting of the year and the dental trade is well represented with over 40 trade stands present. Exhibitors will be showcasing the latest equipment, materials and products for the dental profession. All delegates are encouraged to visit all the trade stands during the two days.

Social events

Following on from the success of last years La Grand Fiesta in the trade show area on Thursday evening, Nobel Biocare will sponsor a similar event. Don't forget all delegates are invited and all members of the trade. Food, wine, music and fun are guaranteed!

The Annual Fun Run takes place on Friday morning from the Rochestown Park Hotel and will take in the beautiful scenic areas of Douglas, Rochestown and surrounding areas. All proceeds will go to Our Lady's Hospital for Sick Children, Crumlin. So get your running/walking gear out and get going!

The Annual President's Gala Dinner will take place on Friday night. A pre-drinks reception will be followed by dinner and after dinner entertainment is provided. For this night, don't forget your dancing shoes. A full programme of events for accompanying persons is also being organised. This will include a tour of the award-winning gardens of Dr John Barry in Cork on Thursday morning and an Art Trail through Cork city on Friday morning.

Our Conference centre, the Rochestown Park Hotel offers guests a wide range of facilities including excellent dining and a relaxing leisure centre and spa which will help delegates unwind after absorbing all the scientific information during the day.

Book early

The Annual Scientific Conference 2007 promises to be both a highly educational and entertaining experience, and you and your dental team are encouraged to attend. Don't delay – book now.

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Dublin conference

The Metropolitan Branch of the Association recently staged its Annual Scientific Conference at O'Reilly Hall in UCD. It was very well attended with 130 delegates hearing high standard presentations. The trade stand area was well integrated, with delegates having the opportunity to take their coffee breaks in the vicinity of the stands.

A view of the Conference in action.

Dr Alva Hope Ross, President of the Metropolitan Branch of the Irish Dental Association (centre), pictured with some of the speakers at the Conference (from left): Dr Albert Leung; Ms Ciara Murphy; Professor David Hussey; and, Dr Paul O'Reilly.

Dr Niall O'Connor (second left), incoming President of the Metropolitan Branch, and current President, Dr Alva Hope Ross (third left), with speakers at the Conference (from left): Dr Mary Clancy; Professor Robbie McConnell; Dr Claire Healy; Dr Brian Dunne; and, Dr Ada Foster.

Enjoying the Conference were Metropolitan Branch members (from left): Dr Declan Meagher; Dr Vincent Nolan; Dr David Patton; and, Dr Vinnie McDonagh.

Vocational dental practitioners at the Conference included (from left): Dr Jenny Flanagan; Dr Rosemarie Mulvey; Dr Marian Nagle; Dr Kate Counihan; Dr Anna Doran; and, Dr Inge Dorman.

BUSINESS NEWS

Professional clean

The new product from Colgate – Total Professional Weekly Clean.

Colgate has launched a weekly toothpaste, Colgate Total Professional Weekly Clean, following research that showed that consumers would embrace the addition of a once-a-week treatment to their current daily regime. According to Aoife Moran of Colgate: "While nothing replaces a professional clean, Colgate Total Professional Weekly Clean has been developed to help patients keep that 'dentist clean' sensation longer in between visits to their dentist".

The product was developed with – and clinically tested by – dentists. It combines Triclosan plus copolymer, and 1450ppm sodium fluoride, with a unique cleaning system of high-cleaning and polishing Silica. According to the company, cleaning efficiency is significantly improved compared to regular toothpaste. Says Moran: "Brushing once weekly with Colgate Total Professional Weekly Clean, in addition to daily tooth brushing with their usual toothpaste, will help your patients keep the professional clean sensation longer between professional cleanings".

Aoife Moran, Senior Dental Detailer.

Kate Martin, Dental Detailer.

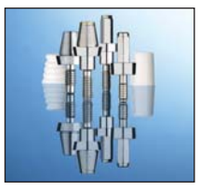
Meanwhile, Colgate has also announced two recent appointments – that of Moran as Senior Dental Detailer and Kate Martin as Dental Detailer.

Nobel expands Beautiful Teeth Now concept

The Nobel Biocare booth (A090 in Hall 4.1) at IDS 2007 in Cologne on March 20 will feature everything the dentist and dental technician needs to provide their customers and patients with Beautiful Teeth Now (BTN) under the concepts of Easy Esthetics, Soft Tissue Integration and Immediate Function. For further information on Nobel Biocare's IDS programme and World Conference 2007 in Las Vegas from May 20-24, please visit www.nobelbiocare.com.

To further support its Beautiful Teeth Now concept, Nobel Biocare has introduced the new QuickTemp Abutment Conical. According to the company, it is an easy and fast solution for chair-side multi-unit temporary restorations, supporting the Nobel Biocare concept of Immediate Function, and supplementing the existing Immediate Temporary Abutment used in single-unit temporary restorations. The QuickTemp Abutment Conical product assortment consists of two parts: an abutment and a plastic coping.

The company has added to its line of porcelain aesthetics with the launch of NobelRondo Press. According to the company, NobelRondo Press is a versatile porcelain solution that can be pressed onto Procera Abutments, Crowns and Bridges in alumina and zirconia, as well as Procera Laminates in alumina. They further state that NobelRondo Press can also be used in a Solo technique for individual inlay, onlay, overlay and veneer applications, and that it is easily applied and highly suited for the initial build-up of permanent aesthetic solutions.



Nobel's new QuickTemp Abutment Conical.

NobelRondo Press.

Nobel Platform Shifting.

Nobel Biocare has also introduced its latest offering for promoting gingival health and beauty – platform shifting. Platform shifting is the concept of 'stepping down' the size of an implant platform to increase the volume of soft tissue, and blood supply to soft tissue, around the implant platform.

The product assortment consists of two platform-shifting adapters, which the company say will convert regular (RP) and wide (WP) platform implants to narrow (NP) and regular (RP) platform implants, respectively. Simultaneously, they convert internal connection (tri-lobe) implants to external hex platforms.

Biomet 3i clinical discussion lecture

'From Placement To Loading: Practical Applications' is an interactive seminar, questioning and sharing experiences on the most pressing topics in contemporary implantology – immediate implant placement and loading. This course includes in-depth discussions on a variety of motivating and stimulating topics including 'what is the scientific and clinical basis for determining the timing of implant placement?' and 'what is the effect of immediate non-occlusally loaded provisional restorations?'

The full day's programme on Friday April 20, 2007 at the Royal Society of Medicine in London is being presented by two clinicians of repute – Dr Barry Wagenberg, DMD and Dr Par-Olov Ostman. Contact Olivia Kirwan of 3i for further information.

Is your pension due a check-up?

Kevin Roche of Liberty advises dentists to review their pension arrangements.

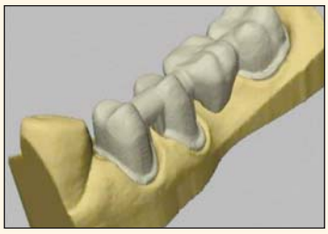
Research conducted by Liberty Asset Management indicates that huge levels of money are being wasted on pensions with outdated allocation rates, uncompetitive management and risk benefit charges.

Kevin Roche, a Senior Pensions Consultant with Liberty says: "Fund performance is only one aspect of ensuring effective pension performance. Allocation rates and charges can also have a huge impact on the size of eventual retirement fund".

Many dentists' pension arrangements were set up years ago when the market was less competitive – that's completely changed now. Existing pension funds that haven't been reviewed in the last three to five years aren't as efficient as they should be. There is generally room to renegotiate the terms either with the existing provider or by moving to an alternative one, increasing the flow of money into the pension and reducing the cost of the add-on benefits such as life cover and permanent health insurance.

Says Roche: "Those with an existing pension should initiate a full review with their adviser and re-broker the market."

Dentists and technicians use the net



An example of the images that a dentist and a technician can examine simultaneously on their computer screens while miles apart.

Having found the internet a valuable source of interaction between dentist and technician, Associated Laboratories of London is now utilising the latest software to help identify and eliminate potential problems at the early stages of crown and bridge work.

Associated Laboratories provides free software for the dentist to install. This enables the company to send a 3D virtual model of the impression for the dentist to inspect for issues such as path of insertion, marginal issues, and bridge design. The technician and dentist can discuss these issues by phone whilst simultaneously looking at the image on their screens.

According to Peter Wagon of Associated Laboratories: "We have found this communication tool invaluable regardless of whether the surgery is five minutes down the road or five hundred miles away. Dentists can check our website www.theteethpeople.co.uk to assess our service offering".

Chewing away acid

According to Wrigleys, research has proven that chewing sugarfree gum, such as Wrigley's Orbit Complete, stimulates the production of saliva by up to 10 times the normal rate in the first few minutes of chewing. Chewing Orbit Complete for 20 minutes after eating and drinking increases bicarbonate in saliva and helps neutralise acids in the mouth. And chewing three times a day as part of an oral healthcare routine which includes regular brushing and flossing is an important aid to long term oral healthcare. The company cites the case of even apparently healthy foods as a threat. For most consumers, a fruit 'smoothie' drink, for instance, represents a healthy alternative to a carbonated sugary drink – the fruit content representing a portion of the recommended daily allowance. However, some health experts are warning that 'healthy' smoothie drinks contain large amounts of sugar, calories and acids. Some even have sugar levels higher than the recommended limit of 10g of sugar per 100g, representing a serious threat to dental enamel. A high consumption of fruit juice can also be detrimental to dental health because fruit juice is now associated with caries development, especially if the juice is in contact with the teeth for a long period of time. Perhaps most damaging of all though is dried fruit which sticks to the teeth, reducing the pH in the mouth for a long period of time.

GSK at ASC

Executives from event partner GlaxoSmithKline Consumer Healthcare (GSK) are looking forward to the opportunity to meet with dental professionals at the forthcoming IDA Annual Scientific Conference in Cork.

The company's portfolio of oral care products will be on display including the new Sensodyne ProNamel – a unique toothpaste created to address the growing problem of acid erosion. In addition, information will be available on medicated mouthwash Corsodyl, which the company says is the 'Gold Standard' for the prevention and treatment of gingivitis.

Sensodyne ProNamel which will be on display at the ASC.

Dentsply lecture

Established and would-be implantologists from across Ireland recently attended a lecture in Dublin organised by Dentsply Friadent. At the lecture, they had the chance to discuss the influence of crestal bone stability on long-term aesthetics with two international experts.

During the two lectures, Dr Paul Weigl and Dr Dietmar Weng described the influence of the implant-abutment connection on peri-implant bone and soft tissue condition.

They explained how the Ankylos implant system can help meet today's restorative demands of excellent aesthetics, through bone maintenance and long-term crestal bone stability. The company is planning a series of similar events this year.

At the lecture evening in Dublin just before Christmas were (from left): Chris Meldrum, General Manager, Dentsply Friadent, Ireland and UK; Dr Dietmar Weng; and, Dr Paul Weigl.

Irish 'ACE' laboratory

The Totten & Connolly team (from left): front – Isobel Totten and Jacquie McCormick; back – Kris Zerlichowski; John McCullough; Gary Graham; Des Connolly; and Stan Totten.

Totten & Connolly Dental Laboratory, Bangor, Co. Down, has been appointed Ireland's first 'All-Ceramic Excellence' (ACE) laboratory by Techceram Ltd. According to Techceram, the ACE concept is a patient-centered quality controlled network which promotes continuous improvement in quality by means of a unique feedback card system. It also promotes teamwork between the dental practice, the dental laboratory and the substructure manufacturer. This enables Techceram to offer a five-year guarantee, conditional on the clinician following the recommended clinical procedure and returning Techceram's feedback cards.

Meanwhile Techceram Technology Centre (TTC), Techceram's in-house dental laboratory, has invested in the latest Lava and Cercon scanners. This allows the company to supply its ACE-accredited laboratories with even more precise-fitting zirconia substructures for their all-ceramic restorations.

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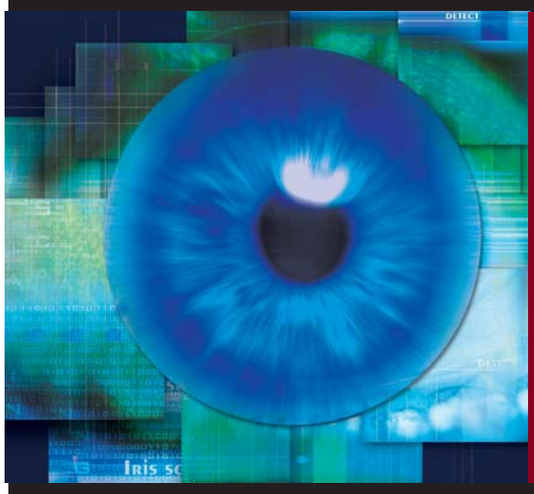

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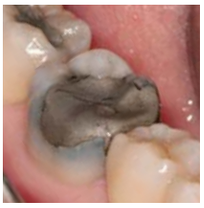

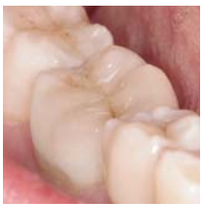

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BUSINESS NEWS

Nano composite, and a cleaning unit

The Synergy D6 shade guide.

The new BioSonic Ultrasonic Cleaning Unit.

Coltène/Whaledent has introduced Synergy D6 composite which, the company states, is an aesthetic nano composite for simplified filling therapy.

Synergy D6 provides the user with a simple, safe and highly aesthetic filling procedure with easily blended shades. Simple selection of shades is a special feature; the result is a selection with only six dentin and two enamel shades. The shade is selected with the unique anatomically shaped shade guide, which is manufactured from composite. The two components, dentin and enamel, can be nested together and the dentist can select the matching shade combinations easily. It's so simple!

Meanwhile, the new BioSonic Ultrasonic Cleaning Unit 125 provides Coltène/Whaledent quality and delivers a variety of customised options for the dental practice.

The time of the cleaning cycle can be selected individually. Additionally, a countdown timer is available to inform the user of the amount of cleaning time remaining, and indicate exactly when the instruments will be ready for sterilisation. This new cleaning unit is also equipped with a solution tracking function to inform the user how long the solution has been in use, so that mandatory changing of the cleaning solution will not be forgotten. With a simple touch of a button, degassing of the solution, i.e., air entrapments which hinder the cleaning process, will disappear. Note that degassing is required every time a new solution is added. The UC125 unit is available with and without a heating unit. A comprehensive range of accessories and BioSonic cleaning solutions provide the user with flexibility to efficiently clean and disinfect instruments, prostheses, and other items throughout the dental practice.

Bespoke treatment centres

According to the manufacturer Heka Dental, UnicLine Treatment Centres are ergonomically designed and feature a compensating movement of the back rest and seat, plus an integrated elbow support, to ensure patient comfort throughout the procedure. (Bespoke Heka Dental equipment is available in the Republic of Ireland from Dacus Dental.) The chair can be laid perfectly flat or raised so high that the clinician can work standing up. The double articulating neck rest improves patient positioning and is suitable for adults and children.

A Heka Dental treatment centre.

The patented round foot control offers 360° flexibility because it can be activated from any direction with either right or left foot. This frees the operator from requiring a fixed working position. It can be used to regulate the speed and torque of instruments, adjust spray functions, activate the powerful chip-blow facility, reverse the micromotor direction, activate the operating light or call the assistant. It also includes three preselected programs for micromotor speed and ultrasonic output.

Eastman courses

Following the changes within the MFDS/MJFD examinations of the dental faculties of Ireland and the UK, the UCL Eastman Dental Institute has produced a short revision programme to assist all future participants in these examinations. The programme will deliver essential knowledge on aspects of postgraduate dentistry ideal for MFDS/MJFD.

Meanwhile, May 2007 sees the launch of the UCL Certificate Course in Conscious Sedation and Pain Management delivered by the UCL Eastman Dental Institute in association with the University of the Western Cape in South Africa. According to the Eastman: "Over a period of eight days, this groundbreaking theoretical and practical course in conscious sedation techniques provides medical and dental clinicians with the knowledge, skills, practical training and confidence to provide effective and safe sedation for their patients".

Commission consultation on health services

CED submits its views on patient and dentist mobility.

For the past months, the CED has been devoting its energies almost exclusively to formulating its response to the Commission's initiative on health services in the internal market. With 'dental tourism' stories and experiences providing an increasing amount of copy for various publications in recent months, it is perhaps timely that the Commission is taking the first steps to put in place a new health directive, having recognised that the guarantee of safety and quality is more crucial in the health area than for other services.

Dental tourism

Crossing borders for dental treatment, often referred to as dental tourism, has many aspects and implications. As the vast majority of patient mobility for dental treatment is self-managed, i.e., the patient decides him/herself to seek treatment abroad, this makes it different from mobility in other areas of healthcare. For the patient, issues include how to access reliable information and how to get redress if things go wrong. For the patient's dentist at home, there is the question, among others, of what his/her obligations are to that patient if problems occur.

Dental tourism – a growing problem for Ireland?

The Revenue Commissioners in Ireland recently carried out a sample survey of submitted Med 2 forms to establish the number of patients who had received dental treatment from a dentist in another jurisdiction within the EU. Only 1% of claims received during 2006 related to patients who had received treatment abroad in 2005, i.e., approximately 220 patients.

The reasons that Irish patients choose to seek dental treatment abroad primarily relate to the cost of dental treatment in Ireland. Patients tend to seek dental services abroad for procedures such as crown and bridgework, and implants.

Over the past two years, the Irish media has been to the forefront in highlighting differences in the cost of dental procedures between the Republic of Ireland and other EU member states, without carrying out a thorough investigation of the reasons for these price differences. Despite the attempts of the Irish Dental Association to help the general public to understand the reasons for these price differences, i.e., overheads, quality, headline costs, not comparing 'like with like', etc., it is only relatively recently that members of the general public have become more aware of the serious problems that can arise as a result of seeking dental treatment abroad. These problems include the fact that it may be very difficult to get recourse in such circumstances.

The preliminary results of a recent survey of IDA members in relation to dental tourism have highlighted that, in a significant number of cases, ill-fitting crowns and implants need to be replaced at a significant cost to the patient.

Dental tourism in other EU countries

It seems from anecdotal information that, while overall patient mobility in dental care is low, there are some regions where it is significant. Patient mobility from the EU15 to the EU10 is particularly noteworthy. The CED understands that some 500-600 dentists in Hungary almost exclusively treat patients from the EU15. Patient mobility from Austria to Hungary and other neighbouring countries (Czech Republic, Slovakia and Slovenia) has been considerable since the early 1990s, with an estimate now of some 5-10% of Austrian patients seeking their dental treatment outside of Austria. Since the enlargement of the EU in 2004, mobility to EU10 countries from EU15 countries has increased markedly. Apart from the Irish experience, there is considerable mobility from Finland and Sweden to Estonia. From Italy patients go mainly to Romania, Hungary, Slovenia and Croatia, though no statistics are available. And, although there is little patient mobility from Greece, what little there is is to Bulgaria and the former Yugoslav Republic of Macedonia (FYROM). There are also contracts between German sickness funds in Brandenburg and Polish dentists, according to which German patients are offered the possibility of being treated in Poland.

Only 1% of claims received during 2006 related to patients who had received treatment abroad in 2005, i.e., approximately 220 patients.

EU framework for health services

Following the exclusion of health services from the Services Directive earlier last year, the Commission published a separate initiative on dealing with health services in the internal market. In order to best deal with cross-border health services, including patient mobility and healthcare professional mobility, the Commission launched a public consultation on an EU framework for health services in September 2006. The consultation, which ran until January 31, 2007, sought the views of stakeholders, including the dental profession.

The Commission's plans for the health sector will also cover ways of encouraging co-operation between different national health systems – sharing best practice and creating networks of centres of reference.

Background

High-quality health services are a priority issue for European citizens. Rights to healthcare are also recognised in the Charter of Fundamental Rights of the EU. The European Court of Justice has made clear that Treaty provisions on free movement apply to health services, regardless of how they are organised or financed at national level. However, many healthcare stakeholders have asked for greater clarity over what Community law means, in general terms, for health services.

The Commission considers that Community action should be founded on two pillars:

1. **Legal certainty.** Citizens, as well as national and local health actors, currently feel they lack this. There is a need to address the wider application of European Court of Justice rulings regarding Treaty provisions on free movement of patients, professionals and health services. This focuses in particular on cross-border care, but cross-border care has consequences for all health services, whether provided across borders or not.
2. **Support for Member States in areas where European action can add value to their national action on health services.** This should enable those responsible for health systems (including social security institutions) to have a clear framework of Community law within which to operate, and take advantage of co-operation between health systems, where helpful, in providing safe, high-quality and efficient health services.

CED submission

As a healthcare stakeholder, the CED has been very active over the past months formulating a response to the Commission's consultation on health services. A Board Task Force meeting to which delegates from all member countries were invited took place on December 11, 2006. Representatives from 17 different CED member associations met in Brussels. This meeting was necessary in order to explore consensus within the dental profession on the issues of patient mobility and professional mobility. The agenda was largely based around the responses to a CED questionnaire from November, in which CED members were asked for their national perspective on the extent, as well as the pros and cons, of patient and professional mobility.

The conclusions of this meeting were further refined at a special Board meeting on January 19, 2007, and after further consultation, a final document was produced for submission to the Commission.

Executive summary of CED submission

"The Council of European Dentists represents over 300,000 dentists through 31 national dental associations. It was established in 1961 to advise the European Commission on matters relating to the dental profession, and its objectives are to promote a high level of oral health and dental care, and to represent the dental profession in the EU.

The CED welcomes the Commission's decision to consult broadly on the areas of possible EU action in respect of health services, and on the place of such health services within the internal market. We would like to remind the Commission that the CED was in favour of the exclusion of health services from the Directive on Services in the Internal Market because of certain specific characteristics of healthcare services. This recognition of the need for a more sensitive approach to health services, where the guarantee of safety and quality is more crucial than for other services, was accepted by the European Parliament and Member States. It should also be borne in mind that it is Member States that are principally responsible for the organisation and delivery of health services. These points need to be taken into account in the discussion on future EU action relating to health services.

There are various types of patient mobility, but in the area of dental care the most common type of mobility is 'self-managed' mobility, where patients decide themselves to seek treatment abroad. This decision is not normally based on medical necessity, lack of availability of treatment in the home State or the search for higher quality in another country. Rather the decision is made in relation to the extent of the patient's own financial contribution to the treatment, which may depend on the inclusion and availability of certain treatments within the patient's social security or insurance system. This makes patient mobility in the area of dental care somewhat different to mobility in other areas of healthcare.

By way of summary, we would like to make the following comments:

1. No active promotion of patient mobility. The great majority of patients in the EU want to access healthcare close to home. The CED does not believe that patient mobility in the area of dental care should be actively promoted.
2. Continuity of care essential for high-quality care. The CED emphasises the importance of continuity of care and of a strong dentist-patient relationship to the overall quality of health services. Dental treatment often requires a series of visits to the dentist to properly plan and carry out the treatment, and to provide post-treatment care. Where patients spend only a short time in the vicinity of the dentist – as is often the case where patients receive care abroad – the overall quality of the health service is difficult to ensure.
3. Promoting the quality of healthcare through training requirements, ethical codes, CPD and patient safety initiatives. The quality and safety of healthcare services can best be ensured by having up-to-date minimum training requirements for dentists; by promoting European-level ethical codes; through continuous professional development; and by a commitment to promoting patient safety.
4. Patient information essential. In respect of information, it is extremely important that patients be informed that high-quality treatment depends on properly planned care with scope for post-treatment care. Patients should have access to clear information on the availability and procedure for receiving reimbursements for healthcare costs abroad.
5. Support for professional mobility and need for adequate language knowledge. The CED supports professional mobility as a useful way of easing local shortages of dentists; transferring knowledge between, and learning from, other health systems. Directive 2005/36 on the mutual recognition of professional qualifications comprehensively regulates professional mobility. Given the importance of effective communication to the quality of healthcare, however, it is essential that competent authorities be able to ascertain whether a health professional's knowledge of the language of the country in which he is providing services is adequate.

With these comments in mind, we consider the following action to be necessary within the EU on health services:

Legislative:

1. The CED considers that in order to provide legal clarity for patients and health systems, the reimbursement of healthcare costs should be dealt with in an EU Directive.
2. The CED considers, however, that professional mobility is comprehensively dealt with by Directive 2005/36.

Non-legislative:

1. The EU has a role to play in co-ordinating the spreading of best practice among Member States; pooling knowledge to avoid unnecessary duplication of research and health technology assessments; and developing networks of centres of reference.

2. The exchange between Member State competent authorities of data on healthcare professionals is very important and will be facilitated through the Internal Market Information System. Healthcare professions themselves have an important role to play in promoting quality through ethical codes and continuous professional development. Quality assurance is principally a national issue".

Conclusion

Dentistry is a relatively small part of general healthcare in the EU. Nevertheless, before any new health directive comes into force, areas of uncertainty, particularly in the area of mobility, that the Commission wants to clear up, must be addressed. These include the questions:

- what flexibility do Member States have to regulate and plan their own systems?;
- how can patients choose between providers and treatments in other countries?;
- how will good information be provided?;
- what happens when patients need compensation if treatment is not successful?; and
- are there minimum common rights or standards for health services?

Dental tourism presents its own problems, which need to be collectively addressed in order to ensure patient safety and high quality dentistry.

MOLDOVA

Basic dental care in Moldova

In 2006, a group of Irish volunteers provided basic dental care in a psychiatric institution in Moldova. PATRICK CLEARY and BRENDAN FANNING describe what they found there, and the treatments they provided.

Sheltering from the sun.

In the summer of 2006 we were part of a dental team that joined carers, physiotherapists, carpenters, plumbers and electricians on a visit to a psychiatric institution near Soroca in Moldova. Formerly part of Romania, Moldova was incorporated into the Soviet Union at the end of World War II, and has been independent from the USSR since 1991. Moldova remains one of the poorest countries in Europe, with 80% of its 4.5 million people existing below the poverty line.[1]

People with physical or mental disabilities have traditionally been placed in state-run institutions. Many of these institutions are dilapidated, poorly staffed and resourced, with minimal care for the residents. The institution that we visited was situated in the Soroca area in the north of the country near the Ukrainian border, and was reached after a bumpy four-hour minibus drive from the capital, Chisinau. It was two miles from the nearest small village with no other house in sight.

There are approximately 300 patients in the institution, who during fine weather roam around the grounds and take shelter from the sun under the shade of the trees. It is difficult to know how they manage in the cold of winter as there was little evidence of heating and many of the windows needed major repair.

Aims of the trip

The trip was organised by the charity organisation Ierlande-Moldova. The dental team was comprised of dental nurses Catherine Tracey and Karen Vaughan, and dentists Pat Cleary, Brendan Fanning and Triona McAllister. Our aim was to assess the 300 patients in the institution and to provide as much pain-relief dentistry as possible. There was no previous history of any dental treatment for these patients. The other volunteers on this trip were there to improve the hygiene facilities, and were busy installing showers and toilet facilities. Work by Ierlande-Moldova is ongoing.

Getting to work

Conditions at the institution are primitive, but we were given two clean rooms in which to work. Both had sinks and electrical sockets. We set up surgery with two portable autoclaves, forceps, elevators, local anaesthetic, an electric drill, and glass ionomer restorative material.

Unfortunately, we did not have a dental chair but used kitchen chairs, which were later customised by the carpenters to give some head support.

The lack of a dental chair meant that we could not use sedation and restraint, as was successfully used in Romania on previous missions.[2]

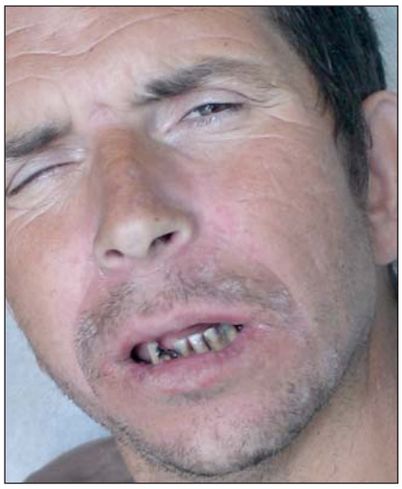
We used bribery (baseball caps, chewing gum, toothbrushes, toothpaste and plastic jewellery) and, as most of our patients had little or no personal possessions and a considerable amount of dental pain, compliance with treatment was good.

On our first day, we tried to see all the patients and make a list of those with the most pressing needs. This gave us a good overall view but failed as a triage system, as the carers, nurses and doctor of the institution organised the flow of patients so that our impromptu waiting room was soon full.

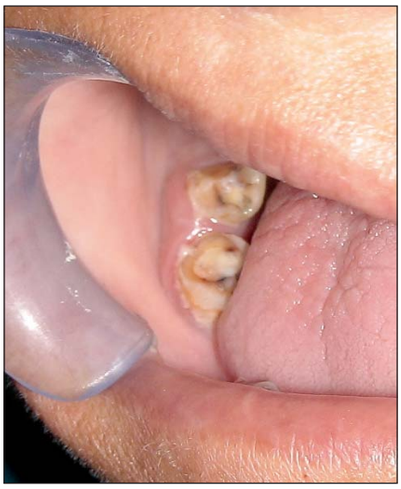
Chronic infection

The majority of the patients that we treated had grossly decayed teeth, with evidence of chronic infection, many with intra-oral sinus tracts and some with extra-oral signs of infections.

Sveta.



Gheorghe.



Oral view. Chronic infection.

Extraction was the most common form of treatment, with 750 extractions carried out in the course of the week. We used articaine 4% for local anaesthesia, as it is more successful, especially in mandibular buccal infiltrations.[3] This was very reassuring when unsure of the efficacy of an inferior dental block. Gheorghe (pictured) was typical of some of the difficult cases that we treated. He did not complain of toothache on the day of treatment but of pain in the right eye, perhaps due to inflammation from 3/.

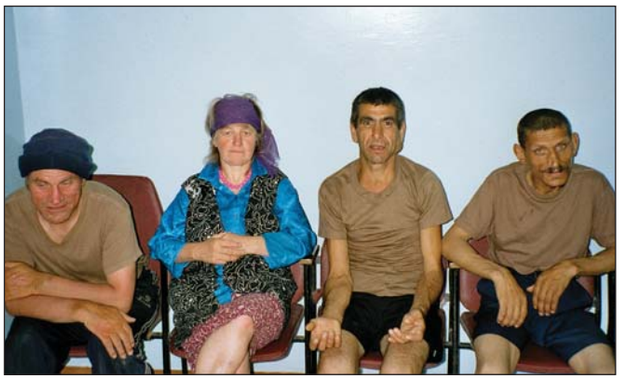
Gheorghe had 16 extractions. Paracetamol and a course of antibiotics were supplied. A pantogram would have been useful in assessing the case, but needless to say we had no x-ray facilities.

Among the residents there were many who appeared to have no mental disability, but nonetheless, due to a physical problem, have ended up in this institution. One such person was Sveta, who had a surgically repaired cleft lip and palate. Unfortunately for Sveta (pictured) her dental care had been neglected over the years. Her few remaining upper teeth were in poor condition, and at a guess her lower teeth may not be in great shape under her metal crowns.

Sveta needed more treatment than we could provide for her on this visit.

Approximately 12 atraumatic restorations and a similar number of gross scaling treatments were carried out.

Ideally, the treatment of the patients should be carried out by the local healthcare system. This has not happened in the past. In the interim, we hope to continue to provide a basic service comprising of urgent oral care, fluoride toothpaste and atraumatic restorative treatment, as outlined in the WHO-endorsed Basic Package of Oral Care.[4]



The 'waiting room'.

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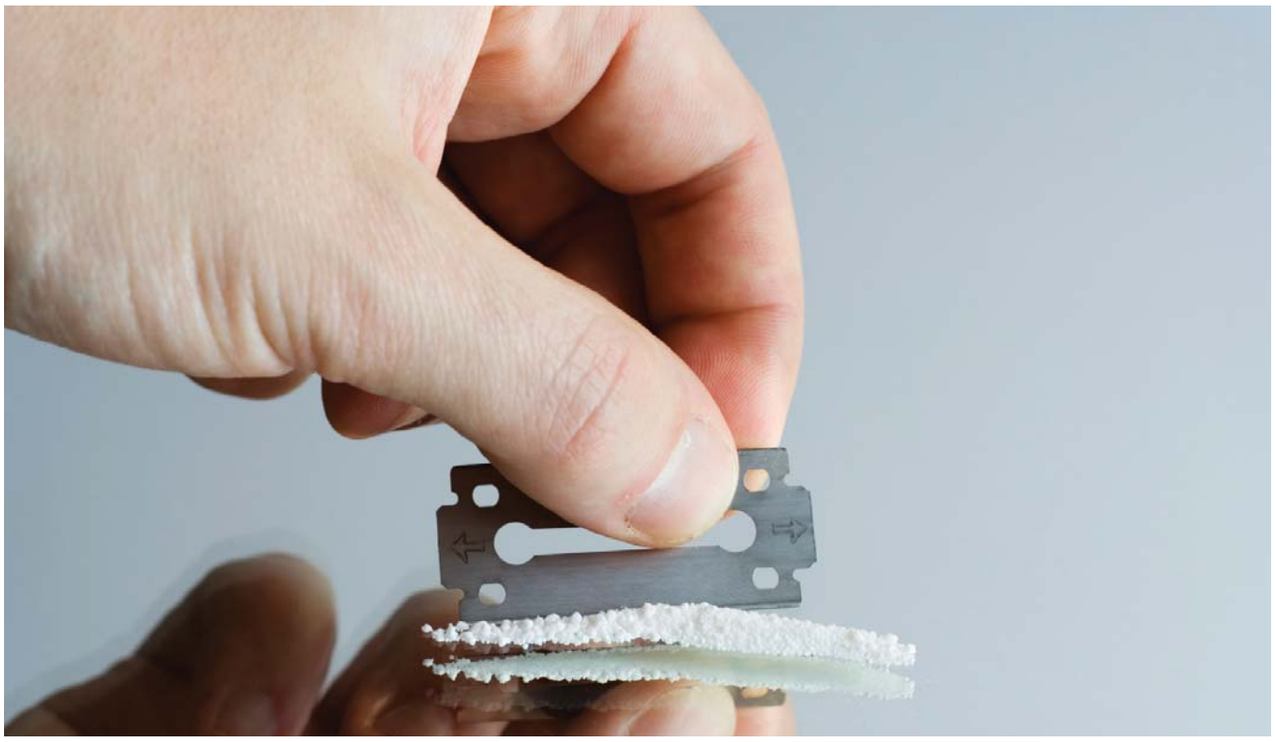
Local anaesthetic shortages continue to affect dentists



Shortages of local anaesthetic have been causing problems for Irish dentists for some time. Meanwhile, reports of lignocaine use within the illegal drugs trade have begun to cause concern. ANN-MARIE HARDIMAN reports.

The shortage originates with difficulties experienced by Dentsply, the manufacturers of Xylocaine, after the closure of their original manufacturing site. An alternative manufacturing site was found in the United States, which was intended to supply both the European and US markets, however an FDA inspection in 2005 found that it was not big enough to do so. The extent and projected cost of the changes required led to the closure of the plant in February 2006. Since then, production of Xylocaine 2.2ml cartridges has ceased, and suppliers have struggled to make up the shortfall.

Safety concerns

The impact on Irish dentists has been significant. Xylocaine 2.2ml has long been the preferred local anaesthetic for a majority of Irish dentists, mainly due to its 'self-aspirating' syringe. This has an important safety function, ensuring that the anaesthetic does not penetrate a blood vessel during injection, with potentially serious consequences. IDA CEO Ciara Murphy explains that Irish dentists trust this product because "they are comfortable with its safety profile and know what it can do".

The shortage also has financial implications, as well as impacting on dentists' training, according to Ms Murphy. In order to use alternative products, dentists have been forced to purchase "old-fashioned" barb aspirating syringes, at some considerable cost, and also to retrain in their use, as more recently qualified dentists are not all familiar with this treatment method.

Ms Ciara Murphy, CEO, IDA, says the Department of Health and Children seems to have no interest in pursuing a resolution.

Despite extensive correspondence with the manufacturers, and also with the Department of Health and Children, the IDA's CEO has become increasingly frustrated with the lack of progress in resolving the matter. Ms Murphy stated that the Department seemed to have "no interest" in pursuing a resolution, and is in fact reluctant to admit that there is a problem. Indeed, in a letter to the IDA, they stated that the Health Service Executive (HSE) had

informed the Department that public dental surgeons were "encountering no difficulties in obtaining suitable local anaesthetic", and that they were satisfied with the action taken by the manufacturers and the Irish Medicines Board (IMB). Ms Murphy contacted the Department in December 2006 in an attempt to obtain an update on the situation, but has yet to receive a reply.

The cocaine link

During this time, reports also began to emerge that lignocaine is being imported in large quantities by drug dealers to 'cut' cocaine. Ms Murphy stated that this is unlikely to be the cause of the shortages, but there is a possibility that it could be a factor. "If this activity is creating an overall shortage, it is possible that it could have a knock-on effect on supplies to dentists," she said.

It is ironic that while dentists are experiencing problems accessing appropriate local anaesthetics, criminals seem to have no difficulty in accessing large quantities. Detective Chief Inspector Cormac Gordon of the National Drugs Unit told *JIDA* that it is a major issue, which An Garda Síochána has been aware of for some time. "In the process of conducting searches of properties over the last 18 months, we have found increasing amounts of lignocaine in locations where quantities of cocaine and cash have also been discovered," he said. He said that it is clear to An Garda Síochána that the local anaesthetic is being used to "bulk up" the cocaine prior to sale.

Garda sources believe the criminals are sourcing the drug in Eastern Europe, but as it is not an illegal substance under the terms of the Misuse of Drugs Act, 1977-1984, and therefore it is not an offence to possess it, their powers are limited. To this end, they are working with the Departments of Health and Children and Justice in an attempt to rectify the situation. Garda preference would be for lignocaine to be made a controlled substance under the terms of the Act, however this is a complicated process. A source in the Department of Health stated that, as yet, no action has been taken on this matter.

The use of lignocaine as a mixing agent for cocaine has created a significantly increased black market value for the drug. However, despite some reports in the media, Detective Chief Inspector Gordon stated that he was unaware of any targeting of dental surgeries to gain access to the substance. Dr Maurice Quirke, Chairman, IDA GP Group, reiterated this, explaining that the crystalline powder used by criminals is totally unlike the liquid formulation used by dentists. "The form we use is entirely unsuitable for the use they require," he said.

What now?

So, two years after supply problems first emerged, what is the current situation?

According to Lindsey Bellamy, Product Manager with Dentsply, the company has sourced supply of both standard and self-aspirating 1.8ml cartridges from Pierrel in Italy, but there are still some delays in the licensing process. "Both standard and non-aspirating formulations of Citanest have been approved by the IMB for distribution in Ireland, but the company is awaiting approval for both of the 1.8ml formulations of Xylocaine," she said. With regard to the 2.2ml cartridges, Ms Bellamy stated that discussions are ongoing as to when to resume their manufacture through this same supply source. However, she stated that: "There has been no definite date announced yet".

Dr Maurice Quirke, Chairman, IDA GP Group, has made several attempts to source product from the United States.

According to Dr Maurice Quirke, there has been no change to speak of on the ground. Dr Quirke stated that he had recently managed to source a stock of Xylocaine 1.8ml from an Irish supplier, but that it was "very intermittently available". He has made several attempts to source the product from the United States, but has met with no success, with suppliers citing "manufacturing problems" as the reason for the continued shortage. Furthermore, supplies of alternative products are by no means guaranteed. "Lignospan is available, and at the moment there seems to be a reasonable supply, but it varies", he says. He voiced the frustration felt by many dentists.

"This thing has been going on for over two years now and I can't understand what's taking so long if it's just a licensing issue."

As things stand, the ball would seem to be in the IMB's court as to how soon these products become available to Irish dentists. *JIDA* contacted the IMB but was told that it was not their policy to release information regarding pending licence applications.

Meanwhile, Irish dentists continue to source local anaesthetic where they can, while waiting for news as to when they might be able to obtain supplies of the product that has traditionally been preferred by 50-70% of their number. The IDA continue to look for answers from government and industry sources, but it seems unlikely that the situation will be resolved in the near future.

Don't forget whole mouth hygiene

Use of an antibacterial mouthwash such as Listerine can reduce supragingival recolonistation through achieving whole mouth disinfection.

Bacterial migration

Oral hygiene tends to focus, quite rightly, on the supragingival regions where periodontal problems develop. However, we should never lose sight of other regions within the oral cavity where bacteria colonise and from which reinfection will inevitably take place.

Teeth represent only 24% of the surface area of the mouth, so even with effective brushing and flossing oral bacteria will still remain and will recolonise.[1] Most species of periodontopathogens colonise several locations in the mouth such as the mucosae, tongue, saliva and periodontal pockets. These act as the reservoirs from which bacteria will migrate to re-form plaque.[2]

The evidence

The study examines more than 50 relevant clinical papers and concludes:"…the microbial load in the saliva and its intra-oral spreading during chewing, muscle activities and tongue movement, plays a crucial role in the continuous intra-oral translocation of bacteria". That's a very clear statement and it demands a response. So we invite you to reconsider the big picture – whole mouth hygiene.

Daily whole mouth disinfection

The sole practical route to reducing recolonisation is to fully disinfect the whole mouth by introducing a proven antiseptic mouthwash such as Listerine to patients' daily personal oral regime. It's a simple solution to whole mouth disinfection, requiring no new patient skills and, as a low viscosity liquid, it accesses virtually 100% of oral surfaces.

Listerine has a well-proven record in eliminating pathogenic bacteria. It has been demonstrated to kill 99.9% of oral gram-positive and gram-negative bacteria, opportunistic bacteria and yeasts in vitro within 30 seconds of exposure.[3]

Long-lasting

The effect is long-lasting too. Studies show that a single rinse of Listerine significantly reduces recoverable salivary bacteria for periods of up to 5 hours.[4, 5] Furthermore, significant reductions of bacteria in both supragingival plaque and on the tongue are sustained 12 hours after a single rinse.[6]

The Listerine difference

So will just any antiseptic rinse be effective? Well we can only suggest you study the clinical evidence.

The free-floating planktonic bacteria in saliva are vulnerable and easily killed, but this effect can be very short-lived. The well protected sessile bacteria within oral plaque biofilms are many times more resistant against antimicrobial agents and can soon re-emerge after rinsing to repopulate the saliva.

Listerine, however, has a particular capability against plaque. It has demonstrated a powerful capacity to penetrate the plaque biofilm and kill in situ over 75% of bacteria.[7] That efficacy assures users of long suppression of bacterial migration and it's why you should make Listerine your recommended solution for patient whole mouth protection.

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An audit of orthodontic referrals using IOTN as a comparison

Abstract: It is important that resources for orthodontic treatment within the Health Service Executive (HSE) are directed towards those children most in need of treatment. At present, children are referred using existing HSE guidelines.

Objectives: To assess the level of treatment need in a sample of patients on the orthodontic waiting list in the North Eastern division of the HSE using the Index of Orthodontic Treatment Need (IOTN) as an objective comparison. Also, to compare these results with the findings of a similar audit in 2003 and to assess the effectiveness of recommendations from the 2003 audit.

Method: Fifty models from each of two orthodontic units were selected. These were scored for the dental health component (DHC) and aesthetic component (AC) of IOTN by a calibrated examiner.

Results: In the 2005 audit, 100% of patients fell into DHC grades 4 or 5. These grades constitute a great need for treatment on dental health grounds. In the 2003 audit, 97% of patients fell into these two grades. The remaining 3% of children in 2003 were fostered and therefore entitled to orthodontic treatment under HSE guidelines. An average of 63.5% of patients fell into AC grades 8-10, i.e., deemed to be in great need of treatment on aesthetic grounds.

Conclusion: The HSE screening guidelines identify patients in great need of orthodontic treatment using IOTN as an objective assessment of this need. The sensitivity of these guidelines requires assessment by measuring the level of unmet treatment need in 15-year-olds in the region. Recommendations arising from the 2003 audit relating to the filling of referral forms and the improvement of study model quality were found to have been effective.

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Introduction

Patients referred to the orthodontic department of the North Eastern division of the Health Service Executive (NEHSE) in the Republic of Ireland are first screened by their school dentist. The screening guidelines used are based on the significance of occlusal traits on dental health. In order to qualify for treatment, patients must fall into either category A or B.

Category A

- Patients with cleft lip/palate;
- patients who require orthognathic surgery;
- overjet >14mm;
- resorbed incisors due to impacted teeth; and/or impedance of eruption due to a supernumerary.

Category B

- Overjet >10mm;
- traumatic overbite;
- anterior crossbite with a functional shift >2mm;
- submerging primary molars requiring surgical intervention;
- impacted canines or other teeth; and/or
- severe hypodontia (more than one tooth missing in each quadrant).

Aims/objectives

The purpose of the original (2003) and follow-on (2005) audits was to ensure that patients referred using these existing screening guidelines were of sufficiently high treatment need. The audits retrospectively examined the level of orthodontic need in this referred population using IOTN as an objective comparison. This article reports on and compares both audits.

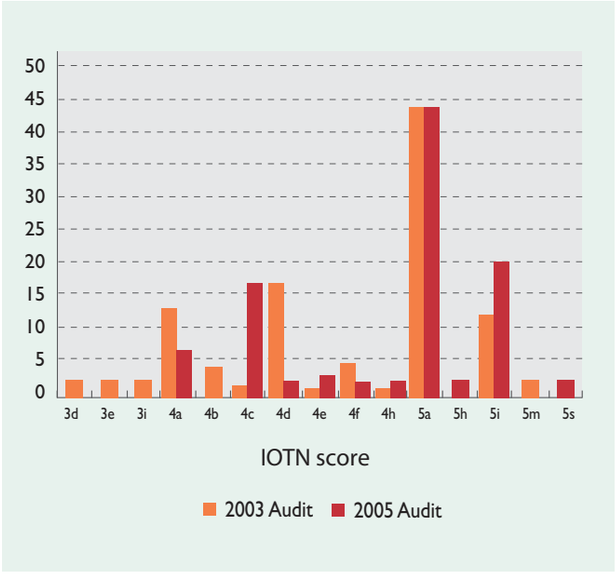


FIGURE 1: Range of dental health component grades.

Standard

By definition, patients falling into categories A or B would have a dental health component (DHC) of IOTN of grade 4 or 5. Children who are fostered are entitled to specialist orthodontic treatment regardless of the severity of their malocclusion. On this basis, an arbitrary standard was adopted in 2003 that 90% of patients should fall into grades 4 or 5. As a result of the findings of the original audit, this standard was increased to 95% for the 2005 audit. No standard was agreed for the aesthetic component (AC), as aesthetics do not form part of the current referral criteria. However, assessment of this aspect would provide additional information on the referred population.

Audit process

In February 2003, 50 study models from each of two referral centres in the NEHSE were selected from those sent into the department. These 100 cases represented approximately one-fifth of the orthodontic waiting list in the NEHSE. Both referral centres in the region were sampled to ensure that all referring dentists were included. The study models were reviewed and scored for the DHC and AC of IOTN by a calibrated examiner. A series of grey scale photographs were used to assess the AC.[1] If a model was broken or could not be articulated properly, the next available model was scored. A follow-up audit following the same procedure was carried out in November 2005 by the same examiner.

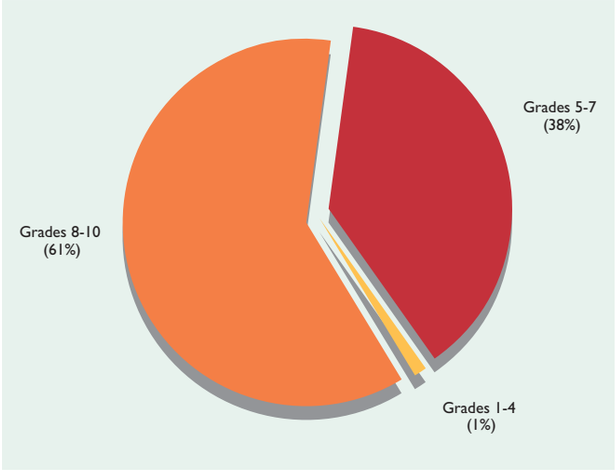
Results

The majority of patients referred fell into grade 5a, i.e. patients with an increased overjet >9mm, accounting for 44% of cases in each audit. Impacted teeth (grade 5i) were the next most common group. In the 2003 audit, it can be seen that three cases of DHC grade 3 were awaiting treatment. Each of these cases is a foster child and HSE policy entitles these children to specialist orthodontic treatment. AC results were similar in each audit.

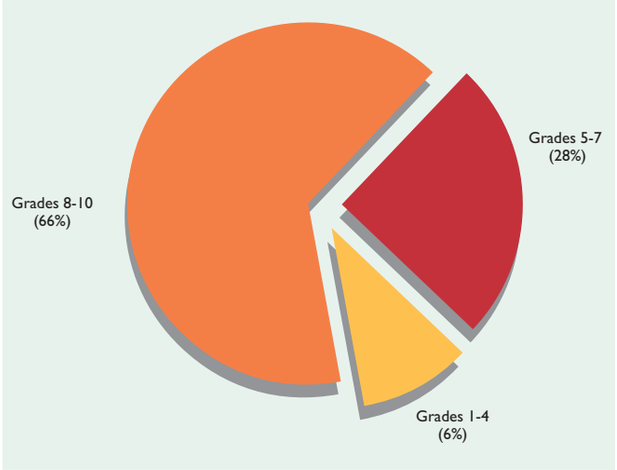
Discussion/recommendations

In the 2003 audit, 97% of patients fell into IOTN DHC grade 4 or 5 and the two-year follow-up audit showed 100% of patients in these grades. From these results, it is clear that the HSE guidelines identify patients with a great need for orthodontic treatment. The group performed better than the original standard set, in which 90% of patients should fall into DHC grades 4 or 5. This compares with a

FIGURE 2: Aesthetic component of audits.



2003 audit



2005 audit

Turkish study, which found that 83% of patients referred for hospital-based orthodontic services fell into grades 4 or 5 of DHC of IOTN.[2] However, they used the Treatment Priority Index as their original screening index. The HSE guidelines do not take aesthetics into account, therefore it was interesting that an average of 63.5% of patients fell into AC grades 8-10, and 33% into grades 5-7. This reflects a majority of patients with a great need for treatment on aesthetic grounds.

It can be seen from the results that there was an obvious difference in grades 4c and 4d between the 2003 and 2005 audits. Grade 4c represents patients with an anterior or posterior crossbite and a functional shift greater than 2mm between retruded contact position (RCP) and maximum intercuspation position (MIP). Grade 4d are patients with severe displacements of teeth greater than 4mm. This difference arose due to an issue with the form that dentists fill out when referring patients to the orthodontic unit. In 2003, few dentists were stipulating on this form that a patient qualified for treatment as a result of a functional shift of greater than 2mm. As a functional shift cannot be assessed from models, these were subsequently scored according to the next most severe feature of the malocclusion, i.e., 4d.

Recommendations following the 2003 audit were:

- recalibration of dentists in the use of the HSE index, with emphasis on the correct categorisation of patients with a functional shift; and
- impressions for study models to be sent to a specialist orthodontic laboratory as a large number of models were incorrectly trimmed.

The above recommendations were implemented following the 2003 audit and resulted in the following findings in the 2005 audit:

- dentists stipulating those patients with a functional shift >2mm on referral forms; and
- no problems with articulation of study models.

Conclusion

This audit and re-audit confirms that the NEHSE orthodontic screening guidelines identify only patients with a great need for treatment, using IOTN as an objective assessment of this need. Although no conclusions can be drawn regarding the sensitivity of these guidelines within the general population, a study is underway to assess the level of unmet treatment need in 15-year-olds in this region.

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First permanent molars with molar incisor hypomineralisation

Precis: Optimal treatment for first permanent molars with MIH should be established on a case-dependent basis, and will often require a combination of preventive and interceptive treatments.

Abstract: Molar incisor hypomineralisation (MIH) is a common enamel defect presenting in the first permanent molars (FPM) and permanent incisors. This article presents the clinical findings and management considerations for the FPM with MIH to the general practitioner. The various treatment options are described with emphasis placed on early diagnosis as the most important prognostic factor.

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Introduction

Many children present to the dentist with severe breakdown of FPM and it has been acknowledged that not all of this destruction is due to caries. Various terms have been used to describe hypomineralised defects in the first permanent molar, including 'cheese molar', 'idiopathic enamel hypomineralisation of the first permanent molar' and 'non-fluoride hypomineralisation in the permanent first molar'.[1] The name of the condition is still debated, however molar incisor hypomineralisation (MIH), as described by Weerheijm, is currently accepted.[1]

MIH is defined as hypomineralisation of systemic origin affecting one to four FPM, and frequently associated with affected permanent incisors.[1]

Prevalence

Prevalence data for MIH is sparse, as children are not currently routinely screened for the presence of MIH molars.[2] Available figures range from 3-25%[3,4] and prevalence figures can be high in otherwise low caries populations.[5]

Aetiology

The asymmetrical occurrence of MIH molars within individuals, and the often concurrently affected incisors, suggests an insult to the ameloblasts at a specific stage in their development, probably at the early maturation phase.[6] **Table 1** illustrates the chronological tooth development for the FPM and incisors.[7] Unfortunately, a single aetiological factor has yet to be established,[6] however a number of speculative causes have been suggested including respiratory tract problems, perinatal complications, prolonged breastfeeding and antibiotic use.[6] Until a definitive aetiology is determined, these possible causative factors could be considered as risk factors for MIH.

	Calcification begins		Crown completed		Eruption	
Tooth	**Maxilla**	**Mandibula**	**Maxilla**	**Mandibula**	**Maxilla**	**Mandibula**
I_1	3 months	3 months	$4^{1/2}$ years	$3^{1/2}$ years	$7^{1/4}$ years	$6^{1/4}$ years
I_2	11 months	3 months	$5^{1/2}$ years	4 years	8 years	$7^{1/2}$ years
M_1	32 weeks in utero	32 weeks in utero	$4^{1/4}$ years	$3^{3/4}$ years	$6^{1/4}$ years	6 years

I_1 = permanent central incisor I_2 = permanent lateral incisor M_1 = first permanent molar

TABLE 1: Chronology of tooth development of permanent molars and incisors.[7]

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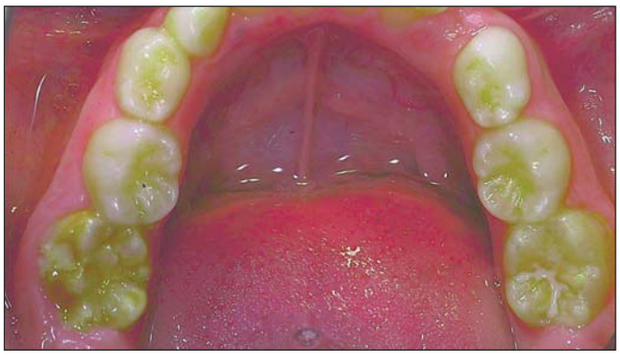


FIGURE 1: Clinical photograph illustrating MIH in a lower left first permanent molar with fissure sealant.

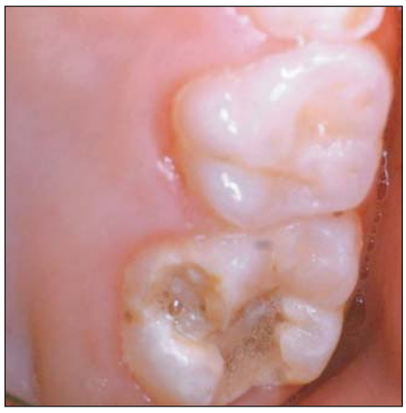


FIGURE 2: Clinical photograph of an upper left first permanent molar with MIH and post-eruptive enamel breakdown. Of note is the atypically shaped cavity outline.

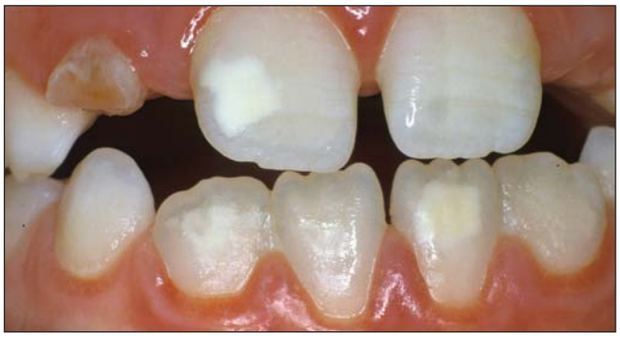


FIGURE 3: Clinical photograph illustrating MIH affecting the upper and lower incisors.

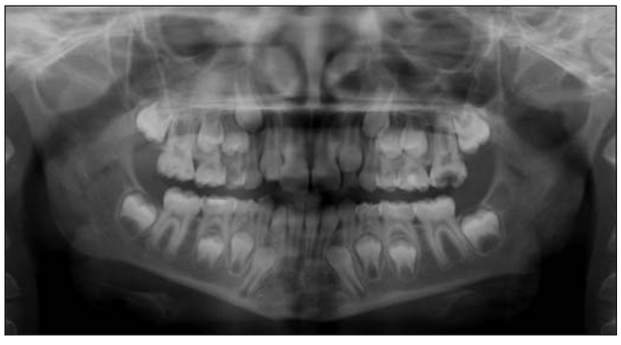


FIGURE 4: OPG illustrating asymmetrical distribution of MIH. Post-eruptive enamel breakdown is evident in upper left first permanent molar. Note normal root morphology.

Clinical features and diagnosis

Clinically, the enamel defects can vary from white to yellow or brownish and there is always a sharp demarcation between the affected and sound enamel. The defects are mostly found on the cusp tips and cusp sides of the FPM (**Figure 1**).[8] One to four molars may be affected, with varying degrees of severity.[9] If one molar is severely affected, the contralateral molar is more likely to be affected.[9]

The hypomineralised enamel is soft, porous and brittle, and breaks down easily under occlusal load. This post-eruptive enamel breakdown can occur very rapidly after eruption (**Figure 2**).[9]

Class	Clinical features
Mild	White/creamy demarcated opacities; no enamel surface breakdown
Moderate	Yellow/brown demarcated opacities; no enamel surface breakdown
Severe	Post-eruptive enamel breakdown

TABLE 2: Criteria used to classify enamel defects in molars and incisors.[1]

In some cases of MIH, enamel opacities can be found on the upper and, more rarely, the lower incisors (**Figure 3**).[1] Defects on incisors rarely lead to enamel breakdown, in comparison to the affected FPM.[10]

There is no universal classification for the clinical severity of MIH. Often MIH is divided simply into mild, moderate and severe (**Table 2**).[1,2]

Diagnosis of this condition may be difficult, particularly when caries is also present. MIH may resemble a number of other defects of enamel.[9] Post-eruptive enamel breakdown may lead to a clinical picture resembling hypoplasia. However, in hypoplasia, the borders of the deficient enamel are smooth, while in post-eruptive enamel breakdown the borders to the normal enamel are irregular.[9] MIH can also be confused with fluorosis, however the enamel opacities of fluorosis are diffuse, in contrast to the well-demarcated borders of hypomineralised enamel seen in MIH.[9] In addition, enamel affected by fluorosis is considered caries resistant, in comparison to the caries prone enamel of MIH.[8] Furthermore, the difference between MIH and amelogenesis imperfecta (AI) is one of definition. In AI, all teeth are affected and may be detected pre-eruptively on radiograph.[9] Generally, affected FPM with MIH are asymmetrical (**Figure 4**).[9] Lastly, there is usually a positive family history in cases of AI.

Management

Management of the FPM with MIH can pose a number of complications to the clinician. MIH is usually detected soon after

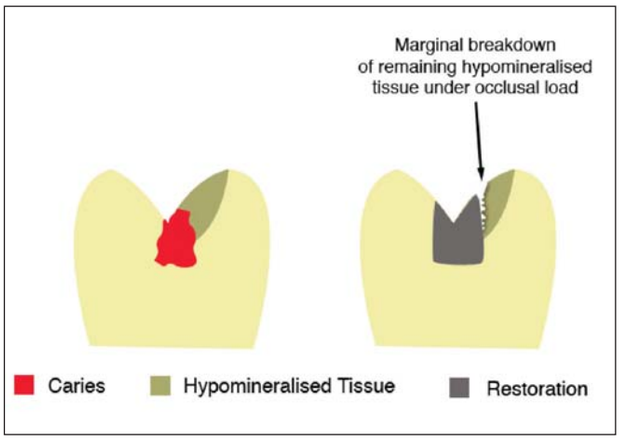


FIGURE 5: Weak, hypomineralised tissue remaining after restoration may subsequently chip away following occlusal load, exposing dentine.

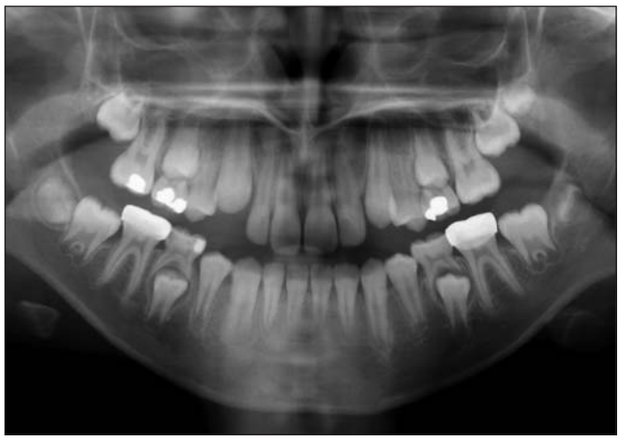


FIGURE 6: OPG demonstrating stainless steel crowns restoring both lower first permanent molars in a nine-year-old girl with MIH.

eruption of the FPM in six- to eight-year-olds and generally indicates a high treatment need, which can pose difficulties in such a young age group.[5] The affected teeth can be hypersensitive, which can lead to difficulties in achieving adequate local anaesthesia[9] and to subsequent behaviour management problems.[5] Sensitivity may also prevent the child from brushing the areas, preventing the delivery of fluoride to these high-risk teeth. Scanning electron microscopy has demonstrated the greatly inferior mechanical properties of the defective enamel compared to normal.[10] Masticatory forces can cause rapid breakdown of this brittle enamel, causing swift progression from mild to severe MIH and exposing dentine. This provides the perfect niche for plaque and bacteria to reside. Caries may progress very rapidly with potential pulpal involvement and its sequelae.[1,9,10]

In order to minimise the loss of enamel and caries ingress in this high-risk population, early recognition and frequent recall is paramount. Both preventive and interceptive management is often required.

Preventive

Besides the standard dietary and oral hygiene advice, topical application of fluoride and the routine use of desensitising toothpaste may offer some relief from sensitivity.[11] A number of other agents are available on the market to reduce sensitivity, for instance Recaldent (GC Corp. Tooth Mousse, Leuven, Belgium), which contains CPP-ACP (casein phosphopeptide-amorphous calcium phosphate) and exists in a number of 'child-friendly' flavours. Glass ionomer fissure sealants can be applied, which may reduce sensitivity and afford some caries protection.[12] A poor etch profile of hypomineralised enamel has been demonstrated, which may decrease the efficacy of the resin-based sealant.[13] However, sealants do not offer any protection against masticatory forces and post-eruptive enamel breakdown.

Interceptive

In the case of post-eruptive enamel breakdown and caries, a more interceptive approach is required.

Direct restoration

Resin-based materials are often used to directly restore FPM with MIH and glass ionomer is commonly used as an interim measure.[1,5,9,11,12] Amalgam restorations are rarely placed due to the typically irregular pattern of post-eruptive enamel breakdown (**Figure 2**). There is some controversy in the literature regarding the efficacy of these various materials in MIH. Direct restoration with amalgam, glass ionomer or resin-based materials has been associated with increased treatment need and subsequent increased occurrence of behaviour management problems.[5] Jalevik and Klingberg retrospectively compared the management of 32 nine-year-old children with severe hypomineralisation of their FPM to a control group.[5] On average, these children had undergone treatment nine times as often as the control group, due to loss of restoration, further disintegration or recurrent caries. Behaviour management problems were exhibited by 44% of the study group, compared to 2% of the control group, probably due to the lack of adequate anaesthesia described in the study.[5]

Reasons for this poor direct restorative prognosis reported in FPM with MIH include the presence of a microscopic transitional zone between clinically hypomineralised and clinically sound enamel, where the mechanical properties decrease linearly.[10] Mahoney et al suggested that weak hypomineralised tissue might be left behind after cavity preparation. Remaining hypomineralised areas may subsequently chip off at the margins of the restorative material under masticatory load, leading to marginal gaps, leakage and secondary caries (**Figure 5**). This results in repeated restorations and increased treatment occasion.[1,6,14] Furthermore, a poor etch profile of the hypomineralised enamel reduces the adhesion efficacy of resin-based materials, which may further contribute to restorative failure.[11,12,14]

The heavily restored teeth may enter into a continual cycle of restoration and failure very early and may require endodontic treatment, which has limited success,[15,16,17] or necessitate enforced extraction later on in life[11,12] with consequent restorative and orthodontic complications.[18,19]

Various strategies have been proposed with the potential to reduce

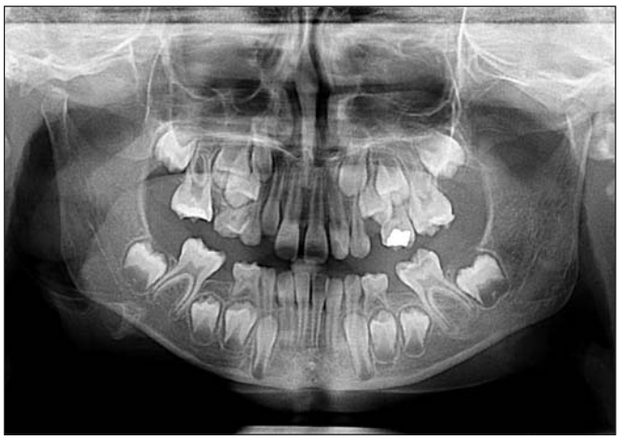
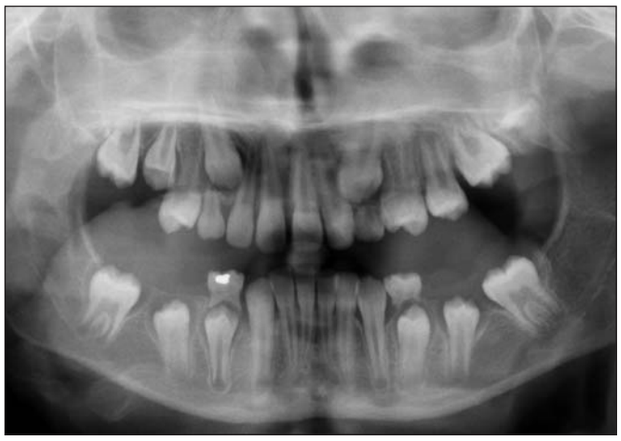


FIGURE 7 (a): OPG illustrating occlusal caries in all first permanent molars in a seven-year-old girl with MIH, crowding and behaviour management problems.



7 (b): OPG taken after extraction of all first permanent molars at nine years. Note more favourable spontaneous space closure in upper arch.

direct restorative morbidity in the affected FPM and associated behaviour management problems,[1,6,10,13,20] for example Venezie et al have reported using sodium hypochlorite to improve etch profile in a tooth with hypocalcified AI.[20] Although research is lacking, these techniques may have applications for hypomineralised defects.

Full coverage restorations

In hypersensitive or severe cases, provision of a prefabricated stainless steel crown (SSC) can be a favourable option (**Figure 6**). Despite the lack of long-term clinical data on their placement in permanent molars, they are recommended by the American Academy of Paediatric Dentistry as a treatment option for hypomineralised defects.[21] They restore occlusion and maintain arch form, reducing sensitivity and eliminating the need for further restorative interventions.[21-25] They are considered durable, relatively inexpensive and reliable[21-24] however, replacement with a laboratory-fabricated crown is usually necessary after eruption is complete,[21] which may add considerable expense. Stainless steel crowns are often presumed to behave similarly to those placed in primary molars, which have five-year survival rates of 92%.[26]

Concerns have been voiced regarding periodontal pockets,[27] nickel allergy[28] and failure due to wear of the occlusal surface.[29] Several authors report difficulty of use and underutilisation of SSCs by general practitioners.[30]

Success has been reported with laboratory-fabricated restorations.[26,31] However, concerns have been voiced over the destructive nature of crown preparation to the immature tooth, and the associated high cost.[31]

Extraction and orthodontic considerations

Extraction of FPM affected with MIH may be preferable to attempting complicated restorative management in such young dentition.[2,910,11,12] The literature suggests a number of circumstances where extraction may be a feasible treatment (**Table 3**).[1,6,9,10,11,12,32-37]

Where FPM are extracted in the mixed dentition, the most significant complication is the potential orthodontic treatment need and subsequent prognosis. Mills claimed that "first permanent molar extractions double the orthodontic treatment time and halve the prognosis".[38] This is based on the fact that FPM are typically the chief source of anchorage in orthodontics.[32] Despite the limited amount of available high quality clinical data, a large body of literature exists in the form of case reports, expert opinions and guidelines to suggest that it is now possible to achieve acceptable results following removal of FPM using fixed appliances, although treatment complexity is to a certain degree case-dependant.[32,33]

Conversely, with the welcome arrival of a more conservative expectation in the minds of both the profession and the general

Situations where timely extraction is a feasible treatment option
Severe hypomineralisation
Severe sensitivity or pain
Large multi-surface lesions/restorations
Difficulty of restoration or history of restorative failure
Inability to achieve local anaesthesia
Behaviour management problems preventing restorative treatment
Apical pathosis
Orthodontic space requirements where FPM are heavily restored in the presence of healthy pre-molars
Crowding distally in the arch and third permanent molars reasonably positioned
Financial considerations precluding other forms of treatment

TABLE 3: Situations where timely extraction is a feasible treatment option.[1,6,9,10,11,12,32-37]

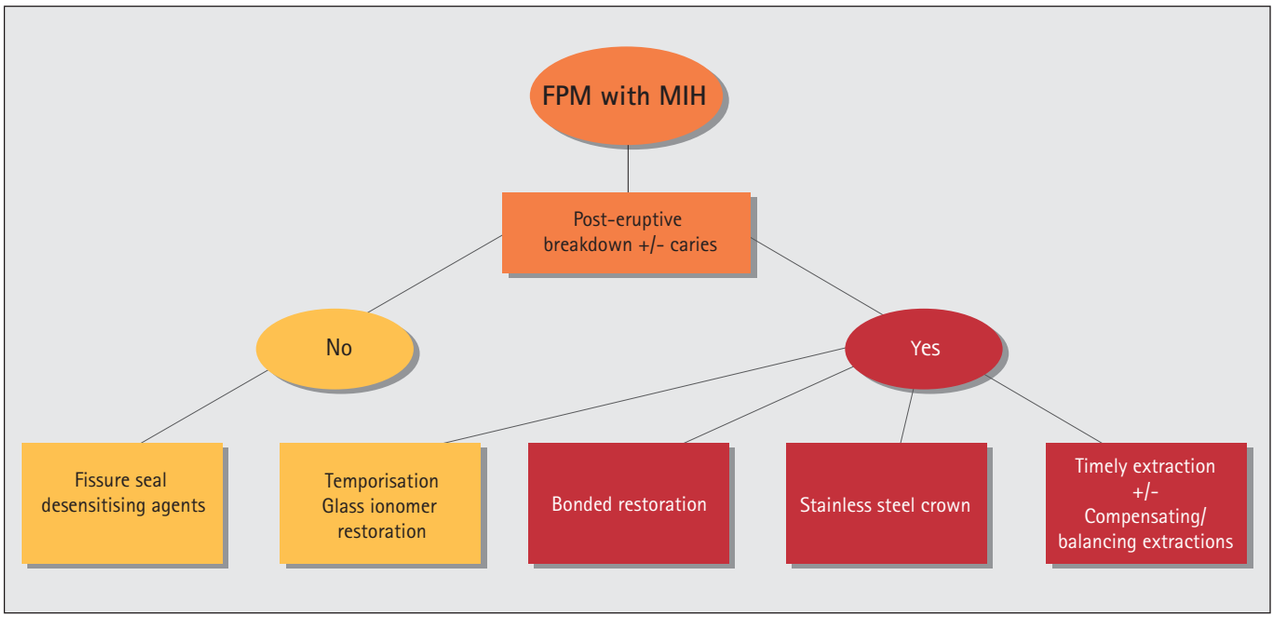


FIGURE 8: Suggested management strategy for FPM with MIH.

public, extraction may be perceived as too radical a treatment option. Extraction may be quite a traumatic experience for the child and may lead to future behaviour management problems.[39] It must also be argued that, while extraction may be the more cost effective option in the short term, subsequent orthodontic treatment can be costly.

To maximise the amount of spontaneous space closure following extraction of the FPM, optimal timing is paramount. It is determined radiographically where the bifurcation of the second permanent molar is just visible.[32,37] This is normally seen between 8.5 and 10.5 years. Optimal timing is particularly important when extracting a lower FPM (**Figure 7**).[32] Earlier extraction may necessitate extraction of the lower second primary molar at the same time to allow free eruption of the second premolar and prevent it from drifting distally.[18,40] However, fixed appliance therapy may still be required at a later stage.[18] Late extractions will almost certainly require fixed appliance therapy.[18] Late extraction is thought to increase the complexity of orthodontic space closure,[19] and has restorative implications if left untreated.[18] The presence of crowding is one of the most important variables for achieving a satisfactory outcome.[41] Where there is little or no crowding present, fixed appliance treatment will be required for adequate space closure.[32,33]

Seddon demonstrated through case reports how orthodontic treatment duration is usually extended when FPM are extracted, and may take six months longer than with the more standard four premolar extraction cases.[35] Some reports suggest that the overbite may deepen as a result of lower FPM extractions.[41,42] However a 90% chance of successful eruption of third permanent molars has been reported compared to a 55% chance with cases involving premolar extractions.[35] It has been suggested that, in cases where space is required, extraction of compromised FPM should be considered instead of healthy premolars.[12,46]

Further compensating or balancing extraction of opposing or contralateral molars, respectively, is often considered prudent. This is especially true where a mandibular extraction is concerned,[18,43] where over-eruption of the upper FPM may impede the desired forward movement of the mandibular second permanent molar.[18,43] In addition, an unfavourable centre-line shift may result from asymmetrical extractions in the presence of crowding.[33] However, there is limited clinical evidence to endorse this guidance and so an orthodontic opinion should be sought before considering multiple extractions.

Conclusion

The general dental practitioner should be aware of the criteria for diagnosing MIH (**Table 2**). All children with MIH should be considered as high caries risk and, therefore, should be closely monitored through frequent recall. It is generally assumed that preventive measures will suffice for the mild to moderate cases. However, the inferior mechanical properties of hypomineralised enamel must not be forgotten, lesions will rapidly extend if caries is superimposed, and thus a more interceptive approach may be necessary even for mild lesions.

The decision to extract or restore FPM with MIH should be based on the patient's age, the number and severity of teeth involved, the number of symptomatic teeth, the likely patient co-operation and the extent of eruption (**Figure 8**). Children and their parents can be reassured that premolars and remaining permanent molars will not be affected.

Further clinical investigation and research is urgently required to validate and refine many of the suggested management problems and possible solutions for the hypomineralised FPM.

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Single unit CAD/CAM restorations: a literature review

Precis: This article reviews the literature relating to computer-aided design and manufacture for single unit restorations.

Abstract: Computer-aided design/computer-aided manufacture (CAD/CAM) has been used in dentistry since 1987. Since then, many CAD/CAM systems have been described, which enable the production of chair-side single unit dental restorations. These restorations are of comparable quality to those made by conventional techniques and have some specific advantages, including rapid production, improved wear properties, decreased laboratory fee and improved cross infection control. This literature review investigates the evidence base for the use of single unit CAD/CAM restorations. Materials, marginal gap, aesthetics, post-operative sensitivity, cementation, cost-effectiveness and longevity are discussed.

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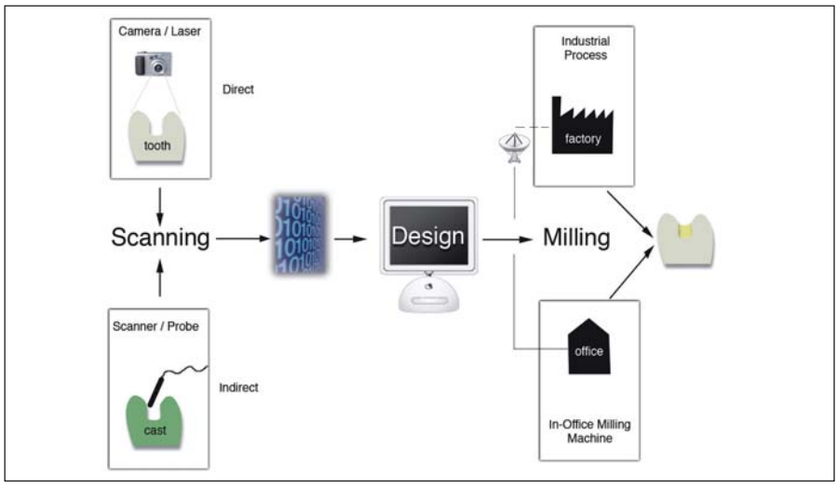

FIGURE 1: The CAD/CAM process.

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Introduction

Computer-aided design/computer-aided manufacture (CAD/CAM) was first applied to dentistry by Mörmann and Brandestini in 1987 when they developed the Cerec system.[1] However, computers have been used to design and manufacture industrial products since as early as 1957.[2] The first major application of the technology was in the automotive and aeronautical industries. CAD/CAM has since developed in parallel with the computer industry; as computers have become more powerful, CAD/CAM systems have become more sophisticated. These systems can now enable dentists to harness the power of computers to design and fabricate aesthetic and durable chair-side restorations.

The CAD/CAM process

CAD/CAM systems utilise a process chain consisting of scanning, designing and milling phases.[3] The scanning device converts the shape of the prepared teeth into three-dimensional units of information (voxels). The computer translates this information into a three-dimensional map (point cloud). The operator designs a restoration shape using the computer, which generates a tool path. This is then used by the milling device to create the shape from a restorative material (**Figure 1**).

CAD/CAM and CAD/CIM

Computer-aided design/computer-integrated machining (CAD/CIM) incorporates databases of restoration designs and is a more accurate term for modern CAD/CAM systems.[4] The distinction between CAD/CAM and CAD/CIM is semantic and, for simplicity, both technologies will be referred to as CAD/CAM in this report.

CAD/CAM systems

CAD/CAM systems can be divided into three groups by their production method (**Table 1**). Direct in-office systems can scan the tooth preparation intra-orally and produce restorations at the chair side. The most widely used in-office system is Cerec,[5] although the Sopha and DentiCAD systems are also available.[6] **Figure 2** shows a Cerec 3 in-office scanner, the design of an onlay and the finished restoration. The indirect systems scan a stone cast or die of the prepared tooth. This can be accomplished in the dental surgery (e.g. Cicero) or the dental laboratory (e.g. Cerec In-Lab). Many of these systems can produce copings, which require the dental technician to add aesthetic porcelain for individualisation and characterisation of the restoration. The only industrial dental CAD/CAM system is Procera (**Figure 3**). With this system, a cast is scanned in a dental laboratory and the information sent to a central manufacturing centre. Here, an oversized die is created and a strong, all ceramic (Al2O3) core is made. This is then sent back to the dental laboratory for porcelain veneering.[7] This has the advantage that all copings are manufactured in one location, in an industrial setting, providing optimal quality control.

Literature review

General considerations

Materials

Conventional restorative materials are typically fabricated in a dental laboratory; metal alloys are usually cast while ceramics can be sintered, slip-cast, heat pressed or cast.[9] Variations in these production methods can cause many potential defects in restorative materials. Small changes in temperature during firing cycles due to human error or machine variations can cause changes in the physical properties of a material. Internal flaws can predispose to ceramic fracture while porosity can result in poor mechanical properties as well as inferior aesthetics.

FIGURE 2: Cerec 3 intra-oral scanner, design phase and completed single visit onlay for a maxillary premolar.

FIGURE 3: Procera Piccolo and scan.

FIGURE 4: Mark II feldspathic porcelain blanks and in situ in Cerec 3 milling unit.

A wide variety of materials have been used to create CAD/CAM restorations (Table 2). Even the use of extracted teeth has been investigated.[11] Most systems grind preformed ceramic blocks to fit the tooth preparation, instead of moulding the ceramic on a die. These materials can be fabricated in an industrial setting prior to grinding, allowing much tighter control over their manufacture. As a result, CAD/CAM restorative materials typically have superior mechanical properties when compared to their conventionally made equivalents.[12] **Figure 4** shows a range of porcelain blanks and a Cerec 3 milling unit.

The flexural strengths of selected ceramics are presented in **Table 3**. This property is frequently used to compare restorative materials, however its limitations should also be noted. Testing methods can differ when measuring flexural strength.[13] Some methods may test the ceramic core,

Production method	System	Scanning method	Restoration produced	Comments
Direct in-office	Cerec 1/2/3	Laser	Ceramic I/O/C*/V*	Most widely used
	Sopha	Laser & holography	Ceramic I/O/C/V	Lengthy design and manufacture
	Denticad	Contact probe	Ceramic I/O/C/V	Most automated
Indirect in-office/ dental laboratory	Celay	Contact probe	Ceramic I/O/C/V	Copy milling only
	Dux (Titan)	Contact probe	Titanium substructures	Requires aesthetic veneering
	DentiCAD	Contact probe	Ceramic I/O/C/V	Mills wide variety of materials
	Cerec In-Lab	Contact probe	Ceramic I/O/C/V	Requires lab stage
	Decim	Laser	Ceramic copings	Requires aesthetic veneering
	Cicero	Laser	Ceramic crowns	Built-in veneering
	LAVA	Laser	Ceramic copings	Requires aesthetic veneering
	Everest	Optical scanner	Ceramic copings	Mills up to 16 units at once
Indirect industrial	Procera	Contact probe	Ceramic copings	Requires aesthetic veneering

*TABLE 1: CAD/CAM systems by production method (I – Inlays; O – Onlays; C – Crowns; V – Veneers; *Cerec 2 and 3 only).4,8*

Name	Ceramic type	Indications	Manufacturer
CerAdapt	Aluminium oxide	Implant superstructure	Nobel Biocare
Cercon Base	Zirconium	Crowns and FPDs	Dentsply
DC-Kristall	Leucite	Crowns	DCS Dental
DC-Zirkon	Zirconium	Crowns and FPDs	DCS Dental
Denzir	Zirconium	Crowns and FPDs	Decim, Ivoclar
LAVA Frame	Zirconium	Crowns and FPDs	3M ESPE
ProCad	Leucite	Veneers, inlays, onlays, crowns	Ivoclar
Procera AllCeram	Aluminium oxide	Crowns and FPDs	Nobel Biocare
Synthoceram	Aluminium oxide	Crowns	Elephant
VitaBlocs Mark II	Feldspathic porcelain	Veneers, inlays, onlays, crowns	Vivadent
VitaBlocs Alumina	Aluminium oxide	Crowns and FPDs	Vivadent
VitaBlocs Spinnell	MgO – aluminium oxide	Crowns	Vivadent
VitaBlocs Zirconia	Al2O3/zirconium	Crowns and FPDs	Vivadent
Zircagon	Zirconium	Crowns	Elephant

TABLE 2: CAD/CAM ceramic materials.[10]

Production technique	Crystalline phase	Example	Flexural strength (MPa)
Sintered porcelains	Aluminous (platinum foil) Aluminous (refractory die) Leucite-reinforced Zirconia-based	Vitadur-N Hi-Ceram Optec HSP Mirage II70	123 139 104
Glass-infused ceramics	Alumina-based Magnesium spinnel ZirconiaIn-Ceram Zirconia	In-Ceram In-Ceram Spinnel 604	446 378
Cast glass ceramics	Mica-basedDicor	125	
Hot pressed injection moulded ceramics	Leucite-based Zirconia and alumina	IPS Empress Alceram162	97
CAD/CAM ceramics	Mica-basedDicor MGC SanidineVita Mark II AluminaProcera AllCeram	229 122 687	

TABLE 3: Flexural strength of ceramic materials by production method.[9]

while others may test the ceramic after veneering. Core materials alone have been shown to be stronger than veneered cores or veneering materials alone.[14] Whether a material is bonded to tooth structure, and the bonding agent used, can also have an effect on its flexural strength.[15] This is most evident with ceramic veneers, which have low flexural strengths before, but high flexural strengths after bonding. Other properties, including fracture toughness, fatigue strength and surface hardness must be considered, in conjunction with flexural strength, when evaluating a material.

Krejci et al used an in vitro method, equivalent to five in vivo years, to investigate the wear of CAD/CAM ceramics, the opposing cusps and luting cements.[16] They found that the wear of Vita Mark I and II feldspathic porcelain blocks was not significantly different to enamel. Dicor® (Corning Inc., USA) ceramic and Dispersalloy amalgam had higher wear than enamel. The wear of opposing cusps was significantly greater than enamel for Dicor and Vita Mark I, statistically less than enamel for Dispersalloy amalgam and not significantly different for Vita Mark II. While this study was in vitro, it used a six-chambered chewing machine, which had previously been correlated with clinical data using resin restorations and amalgams. This method exposed the materials to a wide variety of simulated stresses, including attrition, toothbrush abrasion, chemical erosion and thermal cycling.

Marginal gap

The margin is the interface between a restorative material and the tooth.[17] Completely closed margins are unattainable clinically[18] and the space left between the tooth and the restorative material is called the marginal gap. Marginal gaps of 119µm have been found to be acceptable,[19] however it is prudent to minimise marginal gaps in order to decrease the chance of leakage and staining.

The marginal gaps of inlays and onlays were a problem with early CAD/CAM restorations. The original systems produced inlays with marginal gaps of up to 200µm, where sharp line angles were present in the preparation.[20] This has been significantly reduced with newer software, imaging and machining systems.[21] Denissen et al compared the marginal fit of Cicero, Cerec 2 and Procera ceramic onlays using light microscopy and digital imaging.[22] They found the mean marginal gap for each system to be 74µm, 85µm and 68µm, respectively, and within a clinically acceptable range.

As CAD/CAM crowns are a more recent development, marginal fit has been less of a concern. In a recent study, Bindl and Mörmann compared the marginal fit of indirect CAD/CAM ceramic crowns using scanning electron microscopy (SEM).[23] They found that Procera and Decim had lower marginal gaps compared to Cerec In-Lab and conventional ceramic crowns. However, they concluded that the marginal gap of CAD/CAM crowns covered the same range as conventional all-ceramic crowns. While these results were statistically significant, each of the systems was within a clinically acceptable range. Marginal gaps for full coverage crowns created with the newer Cerec 3 system have been found to be in the range of 32-51µm.[24] Figure 5 presents the mean marginal fit of selected ceramic restorative systems. Variations in study design make it difficult to directly compare results, however all of the marginal gap measurements fall within a clinically acceptable range.

Aesthetics

CAD/CAM systems that use pre-formed ceramic blocks do not have the ability to incorporate intrinsic staining, translucency or opacity. Surface stains can be applied to the restoration to create individualised restorations, however colour change after glazing has been reported for ceramic surface stains.[26] Systems that produce a ceramic core do

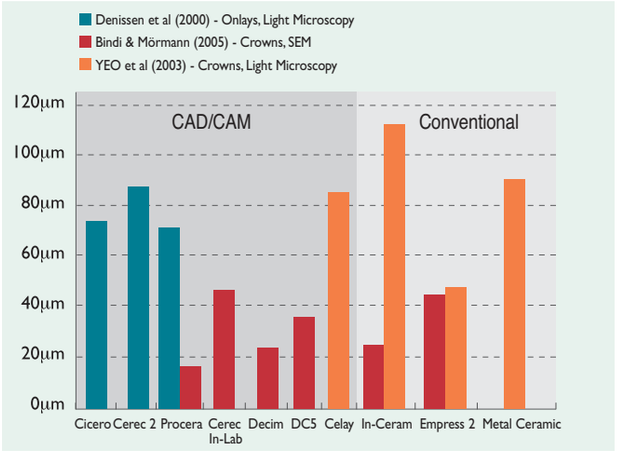


FIGURE 5: Mean marginal fit of ceramic restorative systems by author (SEM – scanning electron microscopy).[22,23,25]

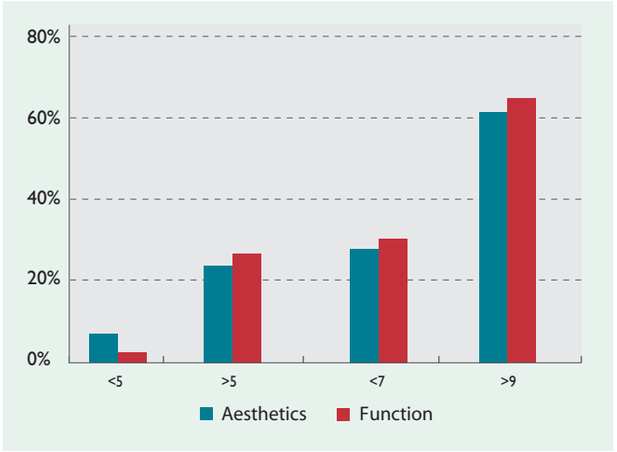
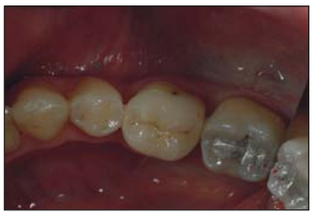


FIGURE 7: Patient satisfaction with Procera crowns after five years rated using a 10-point visual analogue scale.[27]



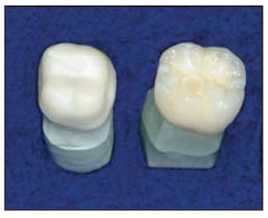


FIGURE 6: Aesthetic layered (Procera) and monolithic ceramic (Cerec 3 surface stained). With kind permission of Michelle Bready and Brendan Grufferty.

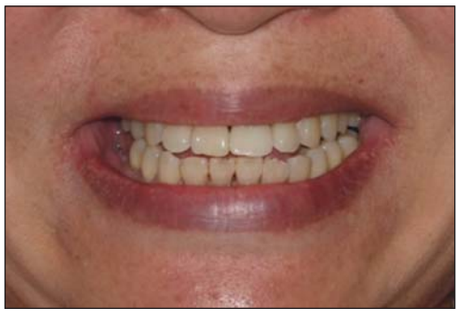


FIGURE 8: Implant supported Cerec crown (upper left central incisor) using VitaBloc ceramic.[32]

not suffer from this problem as aesthetic porcelain can be individually characterised in the dental laboratory (**Figure 6**).[4]

Naert et al investigated patient satisfaction with Procera restorations after five years in vivo (**Figure 7**).[27] Patients were asked to rate their satisfaction with the aesthetics and function of the restoration on a 10-point visual analogue scale (x-axis). Some 87% rated >7 for aesthetics and 94% rated >7 for function.

Colour matching of CAD/CAM ceramics at placement and after an observation period has been investigated. Unacceptable colour matching was present in seven of 32 Cerec inlays after eight years in one study[28] and colour mismatch of 38% was present in another study at 10-year recall.[29] Both studies used United States Public Health Service (USPHS) criteria to rate colour match.

Herrguth and co-workers compared the aesthetics of monolithic and veneered porcelain CAD/CAM crowns in a recent study of 14 patients.[30] Two identically shaped crowns were constructed for each patient, one with a Procera AllCeram core and aesthetic porcelain veneer, and one with Cerec 2 using a VitaBloc Mark II ceramic. These were assessed by three independent examiners and rated on a six-point scale. No significant difference was found between the scores for the veneered and monolithic crowns. Ceramic blocks with three chromas, such as Vita Trilux blocks, have been developed to try to simulate the variation in tooth colour from incisal to gingival. Reich and co-workers[31] found that single colour ceramic blocks with surface staining have better aesthetics than these multicoloured blocks, although the number of restorations was very small in this study. **Figure 8** shows an example of an anterior Cerec restoration.

Post-operative sensitivity

Post-operative sensitivity with bonded CAD/CAM restorations has been described[33] and varies from 0%[34] to 13%.[35] In all cases the sensitivity was transient. Reasons for the variation in sensitivity reported in the literature are poorly reported and require more objective assessment.

Cementation

Procera restorations cannot be acid etched and silanated, therefore they must rely on sandblasting to increase retention. Silanation improves bond strength, which is thought to be a function of wettability. However, the VitaBloc and Dicor ceramics, commonly used in the Cerec systems, have the advantage of bonding to resins when etched and silanated.[36] Zuellig-Singer and Bryant investigated the influence of luting agents on marginal adaptation for ceramic inlays.[37] They found no difference in marginal adaptation between glass ionomer, microfilled composite, fine-hybrid composite and coarse-hybrid composite. However, only the microfilled composite showed no wear at three years. Sjögren et al compared chemically cured composite to dual-cured composite in a 10-year prospective clinical trial.[29] They found a 23% lower success rate when using dual-cured resin with inlays compared to chemically cured resin. Van Dijken showed no significant difference

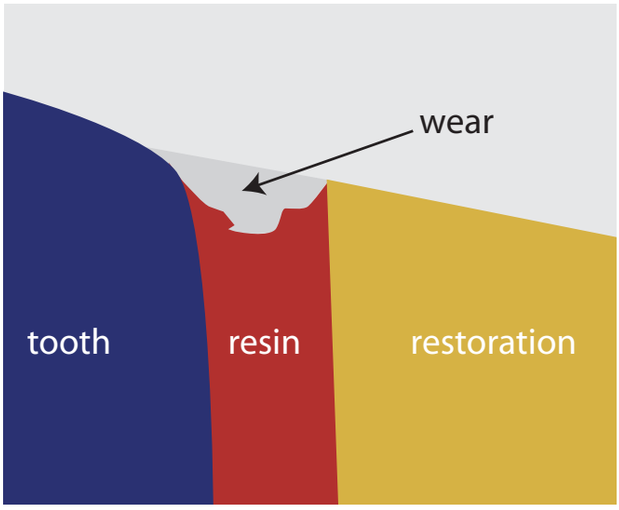


FIGURE 9: Wear of the luting agent (grey) causing ditching at the restoration margin.

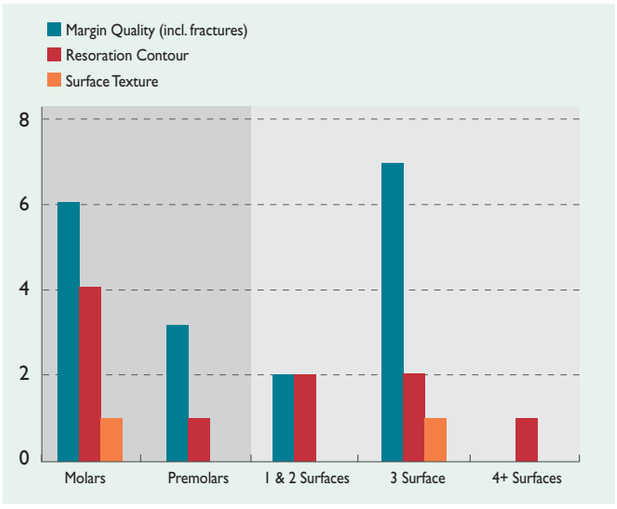


FIGURE 10: Number of failures and reason for failure of Cerec 1 inlays and onlays.[40]

between the two over a five-year period.[38] However, high intensity curing lamps were used, which may have resulted in a greater degree of polymerisation.

Submargination is the presence of ditching at the margins and is especially evident on occlusal surfaces (**Figure 9**).[28,29,39] It has been described in many of the clinical trials of resin-cemented ceramic restorations. While staining is frequently reported at the margins, these sites seem to have a relatively low caries rate.[40]

Cost effectiveness

The initial cost of buying CAD/CAM systems can be substantial and must be considered when evaluating the technology. In-office systems require a substantial investment, but save laboratory expenses as restorations are produced in-house. The current price of the Cerec 3D unit in Ireland is roughly €62,000.

A recent study by Gandjour et al performed a cost-benefit analysis of gold, laboratory-fabricated ceramic and CAD/CAM ceramic inlays.[41] A meta-analysis indicated the number of "failure-free years" for each type of restoration. They used information from German health insurers to establish the financial cost of each type of restoration. Laboratory-fabricated inlays were the most expensive, while CAD/CAM inlays were the least expensive. Because the difference in failure-free years was not clinically significant between any of the three types of inlay, it was concluded that CAD/CAM restorations were the most cost-effective.

Longevity

Inlays and onlays

Inlays were the first application of the CAD/CAM systems and there is a substantial body of literature addressing their longevity. Martin and Jedynakiewicz completed a systematic review of intra-coronal Cerec restorations.[33] A total of 15 studies were selected for the review, which evaluated survival rates, causes of failure, colour stability, wear of ceramic and other problems. They found a survival rate of 97.4% over 4.2 years. Causes for failure included fracture of the ceramic, fracture of the tooth, wear of the cement lute and post-operative sensitivity.

A more recent study provides us with 10-year data for Cerec 1 inlays and onlays.[40] The Kaplan-Meier life table survival rate for these restorations was 90.4% at 10 years. The most common cause of failure was fracture of the restoration and this occurred at its thinnest point. Three of the 15 patients with restoration failures had parafunctional habits. Marginal discrepancies were present in 74% of restorations on the occlusal surface that were examined with a probe, however these did not result in secondary caries in any of the teeth in this study. Three surface restorations had higher failure rates than one, two and four surface restorations, and molars had higher failure rates than premolars (**Figure 10**).

Thordrup et al evaluated the longevity of indirect and direct resin composite inlays and ceramic inlays over a five-year period.[42] They found little difference in the success rates between the groups and that the survival rates were similar to directly placed composite restorations. However, higher failure rates have been shown in direct composites over longer time periods.[43]

Veneers

The literature investigating CAD/CAM veneers is less extensive. Case reports exist documenting ceramic veneer manufacture, mainly using the Cerec system.[44,45] Two in vitro studies have measured the marginal gaps of CAD/CAM veneers.[46,47] Both found no clinical difference between the gap dimensions of CAD/CAM and conventional ceramic restorations. The ability of CAD/CAM to create one-appointment restorations is particularly advantageous for veneers, where provisionalisation can be difficult. This also offers patient convenience and benefit. However, conventional ceramic

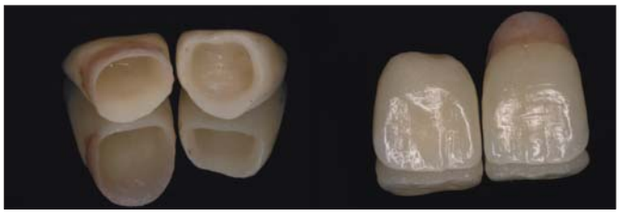


FIGURE 11: Procera copings with layered feldspathic porcelain build-up. With kind permission of Michelle Bready.

FIGURE 12: Procera implant-supported coping and layered Procera crown. With kind permission of Michelle Bready.

veneers may offer a greater flexibility for aesthetic characterisation. Clinical studies are needed to evaluate the longevity of this type of CAD/CAM restoration.

Full coverage crowns

Full coverage crowns are a more recent development in CAD/CAM.[48] Five-year in vivo information is currently available to evaluate this type of restoration's longevity. Bindl and Mörmann evaluated ceramic core and ceramic block crowns created with the Cerec 2 system over a two- to five-year period.[49] They found high survival rates of 91.7% and 94.4%, respectively, using Kaplan-Meier analysis. The authors found no significant difference between the two approaches.

Naert et al evaluated 300 Procera ceramic core crowns over a similar time period.[27] They examined the marginal gap in vitro, and the longevity and patient satisfaction in vivo. Although a mean marginal adaptation of 30µm was reported at the deepest part of the chamfer, this increased to a maximum of 135µm. The cumulative survival rate for this type of crown was 98.4% and the cumulative success rate was 95.6% after 66 months. Similar 10-year survival and success rates have been reported in the literature for this crown system.[50] **Figure 11** shows Procera all-ceramic full coverage anterior crowns.

Discussion and conclusions

The technology is currently at a stage where CAD/CAM dental restorations can be created to similar functional standards as their conventional counterparts. Marginal gaps have reached a clinically acceptable level,[21-23] wear of materials and tooth structure may be less than with conventional ceramic restorations,[16] and patient acceptance is high.[27] The issue of post-operative sensitivity requires more study, despite its reported transient nature.[33] While these technological achievements are impressive, the success of CAD/CAM must be demonstrated in routine clinical use.

High quality 10-year randomised prospective clinical trials and systematic reviews have been published for inlays and onlays using the original Cerec technique only.[32,40] In contrast, only case reports and in vitro data are available for CAD/CAM veneers.[44,46,47] It is clear that these newer developments await longer-term studies before recommendations can be made.

As technologies and systems evolve very rapidly in CAD-CAM dentistry, it is important to adopt an evidence-based approach – clinical trials should precede wide scale clinical usage. This is difficult, as the rate of technological development outpaces long-term trials. The 10-year data for the Cerec full coverage crown, which is already used in many dental practices, is awaited.

The aesthetic result of a restoration is a subjective variable, and difficult to measure. In the end, it is the patient who will ultimately be the final arbiter. High patient satisfaction with the aesthetics of Procera crowns has been described after five years in vivo.[27] Reich *et al.* used one dentist and two dental technicians to attempt to standardise assessment using criteria described by Ryge.[31,51] Surface staining has been shown to be an acceptable method of characterising monolithic ceramic blocks[30,31] although an increase in colour mismatch with time has been reported.[28,29] This may be due to gradual loss of extrinsic staining, or be related to colour change during glazing.[26]

The high cost of CAD/CAM remains an issue. Only one cost-benefit analysis of CAD/CAM restorations has been published.[41] It found that CAD/CAM onlays are more cost effective than gold or laboratory-fabricated ceramic onlays in the German public health system. The authors did not include full or partial coverage restorations in their analysis, nor did they take into account the social and economic benefit of a one-visit restoration. Also, the study did not evaluate direct restorations such as amalgams and composites, which may have yielded more clinically relevant information. Direct posterior composites exhibit higher failure rates over longer time periods than ceramic restorations.[43] The use of ceramic inlays, however must be balanced against their higher cost compared to composites.

New developments in CAD/CAM include the fabrication of endodontic crowns. These are designed to bond directly to the endodontically treated tooth and remove the need to create a post-core. This type of restoration has shown higher success for molars than premolars.[36] The use of CAD/CAM to create custom implant abutments is also promising. Nobel Biocare currently produces a copy-milled titanium custom abutment for use with Procera AllCeram crown copings (**Figure 12**). This system has been shown to be compatible with many implant systems and may be an alternative fabrication method for custom implant abutments.[52]

In conclusion, CAD/CAM offers several advantages over conventional restoration production:

- restorations can be produced quickly from a wider variety of restorative materials;[8]
- provisional restorations are not always required;[4]
- restorations can be produced at the chair side;[53]
- wear of opposing teeth can be reduced;[16]
- there may be a decreased, or no laboratory fee;[41] and
- cross infection between the clinic and the laboratory is minimised.[8]

These advantages must be balanced against the high initial cost of CAD/CAM systems and the need for additional training.

Although the evidence to date suggests that restorations produced by CAD/CAM are an acceptable alternative to their conventionally made equivalents, they are not significantly better. The use of CAD/CAM restorations will ultimately be case dependent. Patient expectations, financial constraints and operator preference, as well as the availability of CAD/CAM systems, will dictate the suitability of this type of restoration on an individual basis in the future.

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ABSTRACTS

External bleaching effect on the colour and luminosity of inactive white-spot lesions after fixed orthodontic appliances

Knösel, M., Attin, R., *et al.*

Abstract

Objective
To evaluate the effect of external bleaching on the colour and luminosity of inactive white-spot lesions (WSLs) present after fixed orthodontic appliance treatment, as a means for achieving colour matching of the WSLs with adjacent tooth surfaces.

Materials and methods
Ten patients with inactive WSLs after therapy with fixed orthodontic appliances were selected. At baseline, the lightness of maxillary incisors and canines was assessed with a colorimeter. Colour determinations were performed in the area of the initial lesions (F1) and at adjacent, sound enamel areas (F2). Then, anterior teeth were bleached once with a bleaching gel for 60 minutes. After a break of 14 days, in-office bleaching was followed by a two-week home bleaching period with daily home bleaching for one hour. After this, colour determinations were repeated. Additionally, patients were asked to fill out a questionnaire to provide information about their degree of contentment with the treatment.

Results
The lightness values of both the F1 and F2 regions were significantly higher after bleaching as compared with baseline. F2 L-values increased significantly more as compared with F1, indicating a better colour matching of these two areas in comparison with baseline. All patients were satisfied with the outcome of the bleaching therapy.

Conclusion
External bleaching is able to satisfactorily camouflage WSLs visible after therapy with fixed orthodontic appliances.

The Angle Orthodontist, 2007, volume 77, issue 4, pages 646-652.

Infant orthopaedics and facial appearance: a randomised clinical trial (Dutchcleft)

Prahl, C., Prahl-Andersen, B., *et al.*

Objective
To study the effect of infant orthopaedics on facial appearance.

Design
Prospective two-arm randomised controlled trial in parallel with three participating academic cleft palate centres. Treatment allocation was concealed and performed by means of a computerised balanced allocation method.

Setting
Cleft Palate Centers of Amsterdam, Nijmegen, and Rotterdam, the Netherlands.

Patients
Infants with complete unilateral cleft lip and palate, no other malformations.

Interventions
One group (IO+) wore passive maxillary plates during the first year; the other group (IO-) did not.

Main outcome measure(s)
Two metrical response modalities were used (i.e., visual analogue scales and reference scores) to score facial appearance. Full face and cropped photographs were compared with reference photographs and were judged. The photographs were judged by 45 judges: 24 laypeople and 21 professionals. Transformation of the scores into z-scores was applied to compare and to pool both response modalities. The validity of each individual judge was evaluated, as was the reliability of the scales. Differences between the treatment groups were evaluated by means of t-tests.

Results
Photographs were available of 41 subjects, 21 with and 20 without infant orthopaedics. No significant differences were found between groups. Mean z-score values for the full-face photographs were: group IO+ = 0.10 (SD = 0.73) and group IO- = -0.03 (SD = 0.48); for the cropped photographs values were: group IO+ = 0.12 (SD = 0.71) and group IO- = -0.06 (SD = 0.55).

Conclusions
Infant orthopaedics have no effect on facial appearance.

The Cleft Palate-Craniofacial Journal, 2006, volume 43, issue 6, pages 659-664.

ABSTRACTS

Post-natal stem cells for dental and craniofacial repair

Robey, P.G.

The postnatal bone marrow contains a subset of stromal cells (skeletal stem cells) that have the ability to form bone, cartilage, haematopoietic stroma, adipocytes and perhaps other tissues as determined by clonal analysis and in vivo transplantation into immunocompromised mice. Similar, but not identical, cells have also been isolated from peripheral blood, although they are rare in humans. Dental pulp of permanent and deciduous teeth, and periodontal ligament, also contain stem cells that have the ability to regenerate a dentin/pulp-like complex, and cementum and periodontal ligament-like structures, respectively. Using appropriate ex vivo expansion conditions and scaffolds, animal models have been created to demonstrate the efficacy of ex vivo expanded populations that contain skeletal stem cells to regenerate a number of tissues. With these techniques in hand, it is possible to consider the recreation of a viable tooth and supporting structures for restoration of normal masticatory function.

Oral Biosciences & Medicine, 2005, volume 2, issue 2, pages 83-90.

The atraumatic restorative treatment (ART) approach for managing dental caries: a meta-analysis

van 't Hof, M.A., Frencken, J.E., *et al.*

Abstract

The number of publications reporting on the survival of atraumatic restorative treatment (ART) sealants and ART restorations has increased considerably in recent years. A systematic investigation of their longevity is therefore warranted. Based on three exclusion criteria, a literature search in the electronic libraries Pubmed and Medline revealed 28 eligible publications for inclusion in a meta-analysis. High mean survival rates for single-surface ART restorations using high-viscosity glass-ionomer in primary dentitions over three years were found (95% after one year to 86% after three years). These rates were statistically significantly higher than for those of multiple-surface ART restorations in primary dentitions ($p<0.0001$). High mean survival rates for single-surface ART restorations using high-viscosity glass-ionomer in permanent dentitions over six years were found (97% after one year to 72% after six years). The mean annual failure rates for single-surface ART restorations using high-viscosity glass-ionomer in primary and permanent dentitions, and for multiple-surface ART restorations in primary dentitions, are 4.7%, 4.7% and 17%, respectively. The number of studies reporting on the retention and caries preventive effect of ART sealants was low. It is concluded that single-surface ART restorations using high-viscosity glass-ionomer in both primary and permanent dentitions show high survival rates. Medium-viscosity glass-ionomer should not be used for ART restorations.

International Dental Journal, 2006, volume 56, issue 6, pages 345-351.

Answers to Spring Quiz on page 58.

1 A grossly resorbed mandible is evident and normal floor of the mouth structures

2 The genial tubercles are evident on the lower anterior occlusal radiograph

3 There is usually four genial tubercles, two superior and two inferior. The genioglossus and geniohyoid muscles are attached to the tubercles. The tubercles can fracture and no treatment is usually required except relief of the denture and analgesia.

Do you know your obligations?

Spring is an excellent time to review your dental practice. ANDREW CLARKE provides a guide to your legal obligations.

It's no use pretending - if you don't have contracts of employment for your staff, then you are operating with your head in the sand.

Reviewing your practice's operation to make sure that it is in line with current legislation is a useful thing to do at any time of the year, but particularly at this time. In late 2005 and in 2006, a number of new laws were brought in which impact on the running of a dental practice and I thought it would be useful to highlight some of these for you.

Maternity leave

On March 1, 2006, the basic maternity leave period was extended to 22 weeks in which maternity benefit is payable. As an employer you are under no obligation to pay maternity benefit unless you have provided for its payment in a contract of employment. Most employers will simply ask their employee to claim the maternity benefit payable by the State but the more generous employer will often top up any difference in the benefit and their salary to ensure that there is no financial hardship during the maternity leave. An additional unpaid period of 12 weeks may also be taken by the employee, with added holidays of four weeks and parental leave (unpaid) of up to 14 weeks could mean that the employee could actually take a full year off work. On March 1, 2007, the basic leave period of 22 weeks will be increased to 26 weeks.

Return to work

Under maternity, parental, adoptive or carers' leave the employee is entitled to return to work for the employer in the same job which the employee held immediately before the start of the period of leave. The employee is entitled to terms and conditions no less favourable than those which would have been applicable to the employee and that incorporate any improvement in the terms and conditions of employment to which the employee would have been entitled to if she or he had not been absent from work.

However, the employer has the discretion, where it is not reasonably practicable for the employer to allow the employee to return to work to the same job, to offer the employee suitable alternative work under a new contract of employment with the same employer, successor or alternative employer.

Suitable in this context means suitable in relation to the employee concerned and appropriate for the employer to do in the circumstances.

You should note that the employee's entitlement to return to work after maternity leave is conditional on the employee issuing a formal notice to the employer in writing four weeks before the expected return to work date indicating the intention to return to work.

All employers are obliged to give employees a statement of the terms and conditions of employment within two months of commencement of employment.

Health and safety

On September 1, 2005, the Safety Health and Welfare Work Act, 2005 came into effect. This Act replaced the Safety Health and Welfare at Work Act, 1989. It introduced some major changes into health and

safety law. The new Act, while retaining the existing employees and employer's duties under the 1989 Act, to ensure in so far as reasonably practical the health and safety of its employees, also created new and expanded duties for both employers and employees. The duties of an employer in a health and safety context now include:

- to manage and conduct the business so as to ensure health and safety. Activities must be managed to prevent improper conduct or behaviour by employees likely to put health and safety at risk. This includes clearly the prevention of bullying or harassment. The view in legal circles is that this legislation may in fact provide the best mechanism for an employee to bring a claim against their employer for bullying or stress;
- to ensure safety and prevention of risk to health arising from the use of any substance or article, or exposure to noise, vibration, radiation or other harmful physical agent;
- to prepare safety statements based upon the risk assessments carried out. The content of the safety statement has been expanded by the Act; safety statements must now be updated regularly and brought to the attention of the employees at least once a year. Employers with three or less employees do not need to have up-to-date safety statements but employees will be required instead to comply with a code of practice to be issued by the Health and Safety Authority;
- to provide health and safety information to employees in an understandable format. This information should refer to any hazards or risks identified at the place of work and the protective or preventive measures to be taken together with the details of persons responsible in the event of an emergency;
- to provide training instruction in a form likely to be understood to include paid time off to undergo safety training. Training must be constantly reviewed and must be provided any time where new plant or equipment is introduced. Employers sharing a place of work will be required to co-operate and share information regarding risks and accordingly their health and safety policies, which clearly will be very relevant to anyone in an expense sharing relationship;
- to ensure the appointment of and consultation with safety representatives;
- to provide and maintain adequate clothing and equipment; and,
- to carry out regular hazard identification, risk assessments and health surveillance of employees to protect against occupational injury and disease.

The new Act also provides for protection for employees who complain about health and safety or lack of it.

The new Act also introduces for the first time a definition of 'reasonably practicable', the concept of which underpins the new Act as it did the 1989 Act. The term means that the employer has to show that firstly he has exercised all due care by putting in place the necessary protective and preventive measures identifying the hazards and assessing the risks of safety and health likely to result in accidents or injury, and secondly, that the putting in place of any further measures is grossly disproportionate in regard to the unusual, exceptional or unforeseeable nature of any circumstances or occurrence that may result in accident or injury.

The Act also significantly increases the potential liability of business owners and managers whilst also increasing the maximum fine under the Act to €3 million. In addition, a new power is given to the HSE to name and shame those convicted of health and safety offences or issue them with a prohibition notice. On the spot fines of up to €1,000 have also been introduced.

Transfer of business

The European Communities (Protection of Employees on the Transfer of Undertakings) Regulations, 2003 (the regulations) provide the legal basis for protection of employees when business is transferred. The Regulations were originally introduced in 1980 and were amended in 2003. Similar types of regulations apply all over the EU. The regulations were originally in response to the EU Directive. The amendment introduced on July 24, 2006, enables a purchaser of a business to obtain information about employees before the employees transfer to him. The seller of a business can be held liable to compensate the buyer if he fails to supply the information requested.

Contracts of employment

All employers are obliged to give employees a statement of the terms and conditions of employment within two months of commencement of employment. Time and again I have come across situations in dental practices where there are no written contracts of employment in place. This is a mistake, however, and employers should always put new employees on contracts of employment. It provides clarity to all concerned as to what the duties and obligations of each party are. They are particularly valuable when it comes to disciplining and dealing with employee grievances or dealing with such matters as bullying and harassment. A good bullying and harassment policy is essential, as is a good disciplinary procedure and also procedures for dealing with employer's computer system. If an employee has been dismissed and the employer has no written contract of employment with the employee, the employer is always going to be facing an uphill battle if he cannot point to a contract of employment with good policies and procedures in place. Invariably it is because of the employer's lack of fair procedures that employees succeed in unfair dismissal actions even if on the face of it the termination would appear entirely justified.

As mentioned above, a good anti-bullying procedure is increasingly important. There are codes of practices now in place which the employer can access and ultimately introduce. A very good website to source a lot of this type of material is www.entemp.ie, the Department of Enterprise Trade and Employment's website, which contains a whole raft of employment rights information and codes of practice, etc. It is well worth checking out.

The author

Andrew Clarke is Partner in the legal firm, Partners at Law, based in Dun Laoghaire, Co Dublin.

Seller beware

DAVID MCCAFFREY explains retirement relief from Capital Gains Tax and looks at how it impacts dentists.

Many dentists will be assessing their current personal and professional options and, for some, this will include retirement. For principals this will involve selling a practice and making a claim to the Revenue Commissioners for retirement relief on the proceeds of the sale.

So what is retirement relief?

In its most basic form a Capital Gains Tax of 20% is applied by Revenue to any gain you make when you sell an asset, e.g. shares, property, paintings. It is the difference between what you sold the asset for, less the purchase price, adjusted for inflation.

Retirement relief is a relief that comes in the form of a reduction in Capital Gains Tax. Although the relief is called retirement relief, a principal does not have to cease involvement in a practice in order to obtain the relief on disposal of all, or part of a practice. This means that a dentist on selling a practice can remain on as a practicing dentist within that practice and work as an associate for the new principal.

There are two key requirements that have to be met in order to be eligible for retirement relief. Firstly, the practitioner must have held the assets of the practice for more than 10 years and, secondly, he or she must be aged 55 years or over.

In the recently announced 2007 Budget, the amount of retirement relief that can be claimed by an individual has been increased from €500,000 to €750,000. This is good news for dentists as it will cover the vast majority of practice sales. This means that where a practice sells for less than €750,000, total relief may be claimed from Capital Gains Tax. The capital gains personal allowance of €1,270 can not be claimed in any year in which retirement relief is availed of.

What is included in the relief calculation?

The practice assets that are considered in any calculation are those that are used by the dentists for the purposes of carrying out their profession. These would normally include the premises, fixtures and fittings, and goodwill, but exclude shares or other assets held as investments.

The good news is that any of what are called current assets and liabilities, i.e., amounts you are owed or owe, together with bank balances and stock, are excluded from any retirement relief calculation.

There are a number of elements that need to be considered if the sale of the practice includes a property. If the dentist is operating out of his or her home, i.e., principle private residence, the 100% principle private residential relief on a future sale of the house may be impacted when the practice is sold and retirement relief is claimed.

If a building is owned by a practitioner as an investment, and the primary purpose is to obtain rental income, then the building might not be included as a chargeable practice asset for the purposes of retirement relief. Revenue will look to see if the practice carried on in the building is an incidental activity and then apportion the building allowing an element for retirement relief and the balance as an investment. The investment element will then be subject to Capital Gains Tax.

It is not unusual for a dentist to sell part of a practice over a number of years to one or more associates. This is an area that can become quite complex as the total received from each of the partial sales has to be added together when considering the tax liability as each portion of the practice is sold.

Transfer between family members

As the €750,000 relief limit is an individual limit, a husband and wife who are in practice together have the facility to take up to €1,500,000 from a practice at retirement. As with most transactions between spouses, a transfer of a practice between a husband and wife is normally treated as not giving rise to any taxable gain or loss on transfer. If the sale of a practice is to a child of a practitioner, then all gains arising from the disposal may qualify for relief, provided the child retains the assets of the practice for at least six years.

Can I retire due to ill health?

If a practitioner has to retire due to ill health and disposes of a practice before their 55th birthday, Revenue will consider claims for relief where all the following conditions are met:

- the practitioner is unable to continue in the profession due to severe or chronic ill health;
- on cessation the claimant disposes of all the practice assets;
- at the time of disposal the practitioner is within 12 months of their 55th birthday; and,
- medical evidence of illness is provided.

What if I sell part of my practice?

It is not unusual for a dentist to sell part of a practice over a number of years to one or more associates. This is an area that can become quite complex as the total received from each of the partial sales has to be added together when considering the tax liability as each portion of the practice is sold.

If any of the disposals occurring within 10 years prior to retirement bring the consideration over the €750,000 limit, then the initial retirement relief that has been granted on the previous partial sales may be withdrawn and a marginal relief provision will apply. The amount of the relief to be repaid can be affected by changes in the retirement relief thresholds over the period of time of the partial disposals.

If a dentist wants to withdraw from the practice and have it run by associates for 10 years prior to retirement, an interesting situation could occur. Recent Revenue cases have indicated that they will view the practice as an investment and disallow retirement relief.

What is marginal relief?

If the money paid for a practice is greater than €750,000 then the gain is taxed at 50%. The effect is to reduce the tax payable to half the excess of the proceeds over the €750,000 limit. This sounds severe but the marginal relief can not increase the tax payable to an amount greater than that due under a normal Capital Gains Tax calculation.

In summary

Any dentist thinking of retiring needs to plan for the event, and that planning should include how to maximise Capital Gains Tax retirement relief. With assets having to be held for 10 years prior to retirement, that planning should start when the dentist reaches 45 years of age. As every dentist's circumstances are different, it is a tax that can become complicated.

The best advice is to review your tax planning with your dental accountant as early as possible, and ensure you make the most of your practice assets.

The author

David Mc Caffrey MBS, ACMA, is a partner with specialist dental accounting practice, MedAccount.

Convert profit into wealth

JOHN O'CONNOR advises on how to turn the profits of your practice into your own personal wealth.

Success breeds success and these days many accomplished dentists are looking to see how they can turn their years of time and commitment to their business into wealth for themselves and their families. The difficult question for many dentists to answer is - how do I transfer the success of my practice to my own personal balance sheet and give myself long-term security? The answer to this question is to look at creating a portfolio of assets including property, shares, bonds and cash. It is also critical to create this portfolio in the most tax-efficient manner.

Case study

Dentist Michael Murphy owns a dental practice that had a significant profit last year and Michael was able to contribute €40,000 to his retirement fund at the end of the year. This fund is entirely owned by Michael and he did not have to pay income tax or PRSI on the contribution.

Michael has now built up €300,000 in his retirement savings. He likes to have control of his wealth, so he decided to open a 'self directed' pension fund. This means he can control where his retirement savings are invested and isn't relying on someone else to do it for him. As a result Michael decided to buy shares in Bank of Ireland, Anglo Irish Bank and CRH. He also decided to invest in a fund which reflects the US stock market and kept some money aside for future opportunities.

Purchasing property in his pension (tax exempt)

Michael has also decided to purchase a property in his pension fund. He has put a deposit down on a property in London which won't be complete until autumn 2008. When it is complete, he will be able to mortgage 75% of the price of the property and pay it back over 15 years. As the property is in his pension, he won't have to pay tax on his rents, and if he chooses to sell it, he will not have to pay capital gains tax on the profit. Michael plans on purchasing a number of properties like this.

The revenue will allow Michael to take 25% of his pension fund in tax-free cash at retirement. The balance of the fund can be used to give an annual income and can be passed on to his estate very tax efficiently. An individual can have up to €5 million in their pension accounts at retirement.

Non-pension investment

Pension investing isn't the solution for everyone. Some people prefer to keep their investments out of their retirement accounts, because they want to access their wealth earlier. Often a mix of both can be appropriate.

Stock market investing

The equity markets have performed very well in recent years. The outlook for 2007 is very positive, as most commentators believe that the global economy is set for an excellent year. However, it is always very hard to predict when the next stock market shock is going to happen. Not many could have predicted the technology crash of 2000 or the events of 9/11. The key point to be aware of is that stock markets are nearly impossible to predict and one must understand this before investing in them. Statistics tell us that while they can be inconsistent, the ups outweigh the downs over time and that you can do extremely well by sticking to it. I am inclined to believe that risk in this area needs to be measured and that investors should only invest a suitable portion of their portfolio into this type of asset. These days there are many products available to investors that give excellent growth exposure to stock markets but still offer a capital guarantee to them over a particular time period. This in my opinion gives the best of both worlds to most investors. The secret of good wealth management is to mix the asset classes so that you can benefit from whatever sector is doing well over a particular time frame. By having a spread of property, shares, cash and bonds you maintain a balance in your portfolio. Always keep a portion of your wealth in cash, that way when good opportunities arise you are able to take advantage of it at short notice. Taking a long-term view is also very important, as investing for the short term can be expensive in fees and you may miss a growth spurt in an asset if you cash out a little early.

A balanced portfolio

On the opposite page is an example of what a balanced portfolio should look like. You will notice that this person has a mix of property, equity products, bonds and cash and also splits her investments between both pension-based products and non-pension investments.

Off plan property investing

One of the key services we provide is to source "off plan" property opportunities for our clients. We source developments for clients who wish to buy from the plans at today's prices. Completion dates are not until some time in the future and often the property goes up significantly in value in the mean time. We found many of our clients were interested in getting involved in property investments but didn't have the time or knowledge of the particular area to make it happen. We have information on these opportunities as they arise.

John O'Connor is Managing Director of Omega Financial Management based in Booterstown in Dublin.

Omega Financial Management

Wealth Management Portfolio

Sample Portfolio - Jan 10, 2007

T: 01 288 4272
E: john@omegafinancial.ie

Investment	Details	Date of purchase	Cost	Current Price	Current Value	Investment Return
Unit Funds						
New Ireland	Evergreen Fund	July 23, 2002	€25,000	€18,300	€40,850	63.40%
Liberty Asset Management	Platinum Tracker Bond	Dec 2, 2002	€25,000	Matured Dec 2006	€30,700	30.80%
Hibernian	Irish Property Fund	June 16, 2003	€40,000	€24,260	€75,190	85.47%
BCP Asset Management	Double Growth Bond	Oct 14, 2005	€10,000		€12,280	22.80%
BCP Asset Management	Quadruple Growth Bond	Oct 14, 2005	€10,000		€13,750	37.50%
Irish Life	Protected Consensus Fund	Nov 9, 2006	€15,000	€10,210	€15,315	2.10%
Pension						
Property						
25 Tempus Axis, London	Purchase Price €250,000					
	Mortgage €187,500					
	Investment €62,500	Oct 25, 2005	€62,500	€300,000	€112,500	80%
Standard Life	Cash Fund (€2,000 per month)	Jan 30, 2002	€24,000		€27,500	14.58%
Cash Deposits						
Irish Nationwide Builing Society	30 Day Notice Account	Sept 6, 2003	€11,667		€13,000	11.43%
SSIA Anglo Irish Bank	Matures April 30, 2007	April 14, 2002	€14,478		€19,117	32.04%
Investment Property						
25 Orby View, Malahide, Co Dublin	Purchase price €300,000					
	Mortgage €240,000					
	Investment €60,000	Jan 29, 2003	€60,000	€375,000	€135,000	125%
Total portfolio			**€297,645**		**€496,202**	**66.71%**

24 - 27 October 2007

FDI Annual World Dental Congress

Dubai, UAE

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DIARY OF EVENTS

MARCH 2007

North Munster Branch, Irish Dental Association – Scientific Meeting

Date: March 13, 2007
Venue: Jurys Inn, Limerick

The North Munster Branch of the Irish Dental Association will hold a Scientific Meeting on March 13, 2007, in Jurys Inn, Limerick commencing at 8pm sharp. The topic will be 'Implants' and the speaker is Professor Duncan Sleeman. For further information contact Dr John Hennessy, Tel: 061 315352.

Metropolitan Branch, IDA – 'Restorative Dentistry in 2007'

Date: March 15, 2007
Venue: Hilton Hotel, Charlemont Place, Dublin 2

Speaker is Dr Billy Davis. Further information will follow when available.

Metropolitan Branch, IDA – Annual General Meeting

Date: March 15, 2007
Venue: Hilton Hotel, Charlemont Place, Dublin 2

Further information will follow when available.

IDS 2007 – The future of dental medicine and dental technology

Date: March 20-24, 2007
Venue: Cologne, Germany

Taking place every two years, IDS is the leading international trade fair for the future of the sector, and the global meeting place for information and communication, product presentations and live demonstrations. At IDS 2007, 1,600 exhibitors from 50 countries will present their innovative products, concepts, processes and services for all segments of dental medicine and dental technology. The fair focuses on the interaction among dentists, dental prophylaxis teams, labs and patients.
Further information is available from www.ids-cologne.de.

Continuing Dental Education Day for Dental Nurses

Date: March 24, 2007
Venue: Dublin Dental School and Hospital

The Continuing Dental Education Day for Dental Nurses: 'A bugs life or yours? …' will be held on Saturday March 24, 2007, in the Dublin Dental School and Hospital. For further information email cde4dentalnurses@dental.tcd.ie.

APRIL 2007

Metropolitan Branch, IDA – Spring Golf Outing

Date: April 1, 2007
Venue: Woodenbridge Golf Club

The Spring Golf Outing will be held in Woodenbridge Golf Club on April 1, 2007. Tee times 10.30am. For further information contact Fergus Duddy, Treasurer, IDA Golf Society, 19 Saint Helen's Road, Booterstown, Co Dublin, Tel: 01 2761929.

Infinitas Orthodontic Mini Implant Course

Date: April 13, 2007
Venue: Birmingham Dental School, Birmingham

DB Orthodontics Ltd will be running hands-on courses for their new Infinitas Orthodontic Mini Implant System throughout 2007. Lead by Richard Cousley, they will provide delegates with the knowledge and skills to implement this new development in fixed orthodontic therapy.
For further information and registration forms contact Vikki Burdess, DB Orthodontics Limited, Ryefield Way, Silsden, West Yorkshire, BD20 0EF, Tel: 0044 1535 656 999, Fax: 0044 1535 656 969, Email: vikki@dborthodontics.co.uk.

IDA Annual Scientific Conference – Cork 2007 Learning Leisure-LEE

Date: April 18-21, 2007
Venue: Rochestown Park Hotel, Cork

More details available on www.dentist.ie.

Orthodontic Society of Ireland – Spring Meeting

Date: April 27-28, 2007
Venue: Hayfield Manor, Co. Cork

The Orthodontic Society of Ireland will hold their Spring Meeting in Hayfield Manor, Co. Cork on April 27-28, 2007. Speakers are Dr Birte Melson and Dr Owen Crotty. Subjects covered are 'Adult orthodontics' and 'Digital future of orthodontics'.

MAY 2007

3rd Asia Pacific Congress on Craniofacial Surgery and Distraction Osteogenesis

Date: May 1-4, 2007
Venue: Republic of Maldives

The Congress will feature four live surgical demonstrations and four hands-on workshops using state of the art distractors and other craniomaxillofacial surgical equipment. A number of eminent surgeons have consented to participate as faculty, and around 200 surgeons have expressed interest in participating in the Congress. Further information about the Congress, including the faculty list, is available at www.distraction2007.com.

JULY 2007

International Federation of Dental Hygienists (IFDH), International Symposium on Dental Hygiene

Date: July 19-21, 2007
Venue: Toronto, Canada

The Canadian Dental Hygienists Association under the auspices of the International Federation of Dental Hygienists (IFDH) is hosting the International Symposium on Dental Hygiene on July 19-21, 2007 in Toronto, Canada. Further informaiton is available at http://www.cdha.ca/ifdh.asp.

AUGUST 2007

2007 Conference on Dentist Health and Wellness: Thriving Dentists, Healthy Practices

Date: August 16-18, 2007
Venue: ADA Headquarters, Chicago

Featuring three programme tracks: 'Ergonomics in dental practices'; 'Personal growth'; and 'Professional impairment'. Further information is available at www.ada.org.

SEPTEMBER 2007

The 148th American Dental Association Annual Session and Marketplace Exhibition

Date: September 27-30, 2007
Venue: The Moscone Center, San Francisco

Pre-session activities for ADA '07 take place on September 26, with scientific sessions on September 27-30. House of Delegates takes place from September 28 to October 2, and this year's session introduces the all-new World Marketplace Exhibition from September 27-29. Further information is available from www.ada.org.

NOVEMBER 2007

Orthodontic Society of Ireland – Autumn Meeting

Date: November 9-10, 2007
Venue: Druids Glen

The Orthodontic Society of Ireland will hold their Autumn Meeting in Druids Glen on November 9-10, 2007. Speaker is Dr Bill Clark. Subject is 'New horizons in orthodontics and dentofacial orthopaedics'.

CLASSIFIEDS

Classified advert procedure

Please read these instructions prior to sending an advertisement. On the right are the charges for placing an advertisement for both members and non-members. Advertisements will only be accepted in writing via fax, letter or email (fionnuala@irishdentalassoc.ie). Non-members must pre-pay for advertisements, which must arrive no later than April 30, by cheque made payable to the Irish Dental Association. If a box number is required, please indicate this at the end of the ad (replies to box number X). Classified ads placed in the Journal are also published on our website www.dentist.ie within 48 hours, for 12 weeks.

Advert size	Members	Non-members
up to 25 words	€75	€95
26 to 40 words	€90	€110

Non-members must send in a cheque in advance with their advert. The maximum number of words for classified ads is 40.

Only if the advert is in excess of 40 words, then please contact:
Think Media
The Malthouse, 537 North Circular Road, Dublin 1.
Tel: 01-856 1166 Fax: 01-856 1169 Email: paul@thinkmedia.ie

POSITIONS REQUIRED

Trinity graduate, VT-trained, returning from private practice in UK, seeks full-time/part-time Associate position. Greater Dublin area. Highly conscientious, dedicated. Tel: 086 8075273.

Experienced TCD graduate (1998) available Fridays for Associate position. Based in Dublin. Please contact 087 7454389.

Enthusiastic and experienced Trinity graduate available part-time/locum (Mon, Tues and Thurs) from March 2007. Dublin City or surrounds. Tel: 085 7198529.

Looking to employ a dental hygienist?
Please contact Dara Jennings, Employment Officer, at 086 0574469. The Irish Dental Hygienists Association.

POSITIONS VACANT

Associate required to replace departing colleague in Monaghan town. Position is part-time with a view to full-time. Busy modern practice. Full support staff. Hygienist. Tel: 047 72744.

Associate wanted for busy city centre practice, Cork City, Ireland. Tel: 086 8199315 or email shandondental@gmail.com.

Associate sought for busy modern Co. Galway practice. 20 minutes to Galway City. Private and PRSI fees. Hygienist and orthodontal support. Start January/February 2007. Email tuamdental@hotmail.com.

Dental Associate required, Coole, Co. Westmeath. Brand new, state-of-the-art, purpose-built surgery, in association with Coole Medical Centre, and very impressive surrounding purpose-built development. Start date February/March. Accommodation available if required. Contact dentadvance@yahoo.com.

Dental Associate required 10 minutes from Dublin City Centre (Northside). Modern practice, latest computerised system, OPG, hygienist and set for further development. Position now available. Contact dentadvance@yahoo.com.

Associate required for Mondays and Wednesdays in Donnybrook two-surgery practice. Hygienist, OPG and digital radiography. Tel: 086 8317719 or email miriamkenny04@eircom.net.

Cork County. Associate required to join busy, friendly modern practice for four weekdays and optional Saturday. Tel: 087 7414060 or email newsquaredentalpractice@hotmail.com.

Associate required in Sligo town. Fully computerised multi-practice with digital x-rays and hygienist. For further details contact Maurice Fitzgerald, Tel: 087 6491859 after 6pm, or email mfsc@gofree.indigo.ie.

Associate required to join a number of colleagues in a busy multiple practice in Ballinasloe, Co. Galway. Many friendly patients. Excellent staff. Modern equipment, OPG, Ozone, etc. Full- or part-time considered. Email rothwellauct@eircom.net.

Galway. Associate required for busy Galway City Centre practice. Full book. For further information contact Liam at dotmcgee@eircom.net.

Dental Associate required to replace colleague in busy friendly practice in Ballyhaunis, Co. Mayo. Full book, clinical freedom, OPG, hygienist, implants. Private, PRSI and medical card. High standards, long-term view expected. Immediate start. Contact Bernard Jennings on 086 8220297/086 1730192.

Associate required for busy thriving practice in Co. Tipperary, Ireland. Modern, fully equipped surgery, OPG, hygienist and excellent support team. For further information contact Linda on 087 2281282 or email themallpractice@eircom.net.

Associate required two to three days per week to begin. Start March 2007. Dublin City Centre. Tel: 01 6701166.

Associate required for dental practice in South Kerry to replace departing colleague. Tel: 087 9831290.

Oranmore, Galway. Experienced, conscientious full-time dental associate required to replace departing colleague end February 07. Full book and excellent team support assured. Contact 086 820 5838 after 7pm or email phewatal@eircom.net.

Associate required in Kerry. Immediate start. View to buy. Very busy practice. Replies to Box No. J107.002.

Full/part-time Associate required to replace departing colleague in busy practice. Fully computerised, digital radiography, hygienist. One hour south of Dublin. Contact jsel@eircom.net.

Full/part time Associate wanted for progressive seven-surgery practice in the Midlands. Visiting implantologist/periodontist. 40 mins from M50. Excellent support staff. Fully computerised with digital intra-oral and extra-oral radiography/intra-oral cameras. Tel: 087 6874234 or 087 8518489.

Dental Associate required for busy modern Limerick City practice. Fully computerised with digital radiography. Tel: 087 9977763.

Experienced Dental Associate required for part-time/full-time position in Limerick City. Mixed friendly practice. Tel: 086 8387405.

Part-time with very flexible hours and days for Dental Associate in South West Dublin. Digital OPG/intra-oral. Tel: 086 8012940. Immediate start.

Part-time position for Associate Dentist in Limerick City Centre. Fully computerised and digital radiography. Tel: 061 313099 to discuss position.

Full-time Associate required in Westport, Co. Mayo. Excellent staff and location. Busy practice in modern surgery. Tel: 086 8562790 or email theresadentist@eircom.net.

South Tipperary. Associate required for busy digital surgery two to three days per week. Saturdays also available. Tel: 087 8344001.

South Dublin. Full-time Associate required for busy, friendly two-surgery practice possibly with a view. Tel: 087 8344001.

Full time Associate sought. Progressive, modern, two-surgery practice 15 mins Letterkenny, Donegal. Excellent support staff. Fully computerised. Digital intra- and extra-oral radiography. Contact Derval on 074 9152728 or Rachel on 086 8514826.

Part-time Dental Associate required to replace departing female colleague, for busy (full book), modern dental practice in Sandymount, Dublin 4. Fully computerised, hygienists, OPG, two-surgery practice. Contact Dermot McMorrough at info@sandymountclinic.com or 086 2340551.

Locum/Associate required for two to three days per week in bright, busy Naas town centre practice. Tel: 085 7123203 between 6-9pm or email denphil@eircom.net.

Associate or locum dentist required to practice in a private practice in Co. Louth town one hour from Dublin. Modern equipment, OPG, hygienist. Good mix of private, social welfare and medical card patients. Please contact 041 6853235 or 086 3954048.

Locum dentist required to cover maternity leave, minimum six months, in busy, two-dentist practice. Full book, excellent staff, full- or part-time hours available. Start anytime from November. Tel: 053 9121733 (daytime) or 087 6888606 (evenings).

Locum dentist required for a busy North Cork practice, to cover maternity leave from mid-February 2007 to September 2007. Half-hour from Limerick. Three-quarters of an hour from Cork. Tel: 063 81958 or 087 7671515.

South Tipperary. Locum dentist required for maternity leave. Part-time. Flexible hours. To start February 2007. Phone Ronan on 087 7451745 or email ronan_odonoghue@yahoo.co.uk.

Locum required for private dental practice to cover six-month maternity leave in Ballyclare, Co. Antrim, 12 miles from Belfast. Full- or part-time beginning March onwards. Fully computerised, OPG and hygienist. Tel: 00 44 28 93352805.

Part-time maternity leave locum required for Dublin 9 practice from mid March to end of July. Tel: 01 8379726 or 086 8079736.

Experienced dental surgeon required to join group practice in the middle of Ireland. Excellent prospects. A good mix of PRSI, GMS and private patients. For further details, Tel: 086 8536342 between 7.00-10.00pm any evening or email lboland@iol.ie.

Dental surgeon required full/part-time for South West Dublin practice. Phone Pauline on 087 6889394 for interview.

Part-time dental surgeon required in very busy dental practice in Midleton, Co. Cork. Immediate start. Tel: 086 1733861 after 6pm.

Dentist required for afternoon sessions and full day Friday at busy South West Dublin practice. Tel: 01 4512194 or 087 9075573.

Dentist to replace Associate in three-dentist practice in Bray. Digital radiology, computerised, Britesmile, facial cosmetics. Forward CV to drmurphyjohnj@yahoo.co.uk. Experience in private practice essential.

Experienced full-time dentist required for very busy three-person South Dublin dental practice beginning December 2006. Good Private/PRSI mix. For further details Tel: 087 9887821 or email aoifecox@iol.ie.

Dentist required to replace departing colleague in busy two-surgery practice in Monaghan. OPG, hygienist available. The position is part-time with a view to full-time. Tel: 086 3971113.

Full/part-time dentist required to work in the community dental services in HSE Dublin North East. Email: mary.ormsby@mailc.hse.ie.

Full- and part-time dentists required to work in the HSE community dental service in Kildare and West Wicklow, Ireland. For further information email Siobhan.doherty1@mailm.hse.ie.

Full-time dentist required. A busy dental practice in Galway City (multiple practice). Full book. Position available from early March 2007. Long-term Associate. Apply with CV to Box No. J107.001 or call 00 353 87 2332308.

Dentist required full time in ultra-modern practice in North West area. Must be enthusiastic and motivated, excellent terms and conditions for suitable candidate. Please phone Siobhan on 087 7990693 or 071 9625802 or email pdoran@boxsmart.ie.

Dentist required for city centre practice (O'Connell Street) – part-time. Experience preferable. Immediate start. Contact Simon on 00 44 7809638216 or 00 44 7796012616.

Sessions available in Dublin City Centre dental clinic. Full day sessions preferred. Tel: 086 8351461 or email: sean@glenbeg.com.

Enthusiastic and experienced general practitioner wanted to join our practice in Galway as an Associate with a view. With digital radiography, OPG and I-Cat scanner, Cerec 3D, intra-oral cameras. Full staff support and hygienist. Tel: 091 550944 (after 8) or email drpmoore@eircom.net.

We have a vacancy for dental nurses to join our spirited team at each of our progressive practices in Dublin and Galway city centres. Telephone Emmet on 086 8187373 (office hours).

Qualified dental nurse required for full-time position in the HSE community dental service in Dublin Central/South City. Contact Colleen O'Neill, Principal Dental Surgeon, Tel: 01 6455421 or email colleen.oneill@mailm.hse.ie.

Dental surgery assistant required, experience preferred but not essential. Modern practice, Cabinteely area. Reply to dubdent@eircom.net.

Hygienist wanted to cover maternity leave or possibly longer. To start mid March. North East area. Tel: 087 2685973 after 5.30pm.

Part-time hygienist required. Carlow orthodontic practice. Please forward your CV to Audrey Garrett, c/o Dr Brian Halton, The Old Church, Ormonde Road, Kilkenny.

PRACTICES FOR SALE/TO LET

For sale, Midwest. Single-handed, long-established busy practice for sale. Flexible options available. Tel: 087 0560056.

For sale, Meath. Superb location. Fully serviced. Two/three surgeries. Dedicated OPG area. High profile. Very busy. GP/medical consultants' complex. Admin/reception facilities. Flexible leasehold options. Tel: 086 8075273.

Cork. Practice leasehold/freehold for sale. Owner retiring. Tel: 087 2707970.

For sale, Newry. Top class, flexible leasehold. Two surgeries, well equipped, ample room four to five surgeries. Booked three months, excellent staff/location. Principal can assist transition. Tel: 00 353 86 8075273.

For sale, Fairview, Dublin 3. Practice premises with established planning permission for entire house (1,800sq ft approx.) for dental/Medicap/Allied practices. 775K. Tel: 01 6606589.

For sale, Dublin South. Long established single-handed dental practice and house. Excellent location. Dentist retiring. Tel: 087 6713485.

Consultation and practice room to let. State of the art premises. Fully serviced. Contact Chatham Centre, 4 Chatham Street, Dublin 2, Tel: 01 6139930.

To let. Ideal premises in new landmark building at major intersection in Dublin 12/24 off Junction 10 M50. Would suit dental/aesthetic or dental/orthodontic practice. Other related medical specialties already in building. Contact Leslie O'Hara on 086 2555369 or email leslie@caramedical.co.uk.

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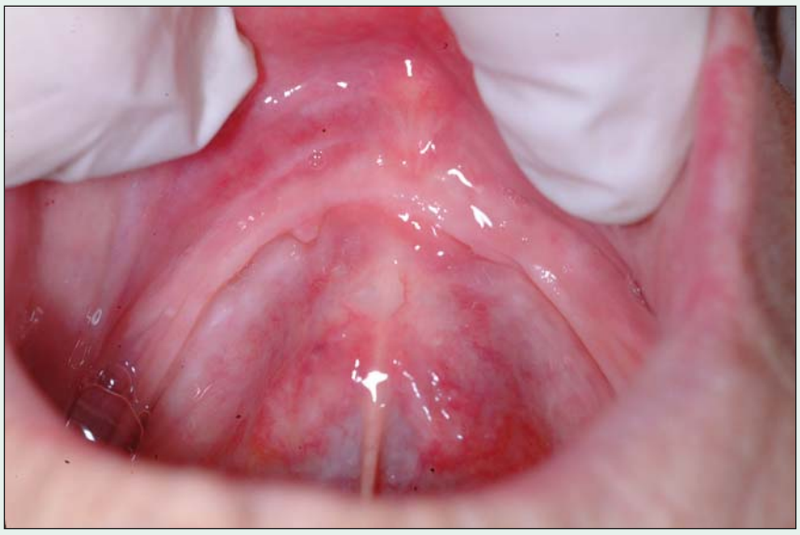
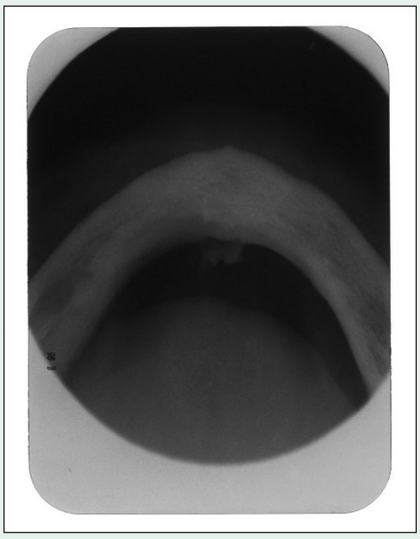
Spring Quiz

Presentation

A 71-year-old lady was referred to, the Accident and Emergency department in the Dublin Dental School and Hospital by her General Medical Practitioner. She had a suspected floor of mouth swelling posterior to a hard bony swelling in the midline. The patient was unsure of time of onset of the swelling and there was no pain associated with the selling.





Questions

1. What do you see in the photos?

2. What are the bony swelling in the midline of the medial aspect of the mandible

3. What is attached to the bony swelling?

Answers can be found on page 47

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*Szöke J, Bánóczy J, Proskin HM (2001) Effect of after-meal sucrose-free gum-chewing on clinical caries. *Journal of Dental Research* **80(8)**: 1725-29.

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