BDJ Team
JUNE 2014

Achieving
a good bond

BDA
British Dental Association

DENTAL SHOWCASE'14

9–11 October 2014, ExCeL London

Putting innovation into practice!

• 350+ stands • Discover and trial what's new • Meet and share ideas with friendly experts for the benefit of your practice and patients • Learn new skills and techniques • Enjoy exclusive show offers • Benefit from hands-on demonstrations • Network with colleagues and industry thought-leaders • Gain valuable CPD

Putting innovation into practice for every member of the dental team.
Save the date and register now for free!

Visit: www.dentalshowcase.com
Call: +44 (0)1494 729959
Email: register@dentalshowcase.com
Text: Your name, postal address, occupation and GDC number to 07786 206276

Scan the QR code with your phone

BDIA DENTAL SHOWCASE
Putting innovation into practice

Gold Sponsor

Oral-B®

BDIA Dental Showcase 2014 is organised by the British Dental Industry Association (formerly the BDTA), Mineral Lane, Chesham, Bucks, HP5 1NL Tel: +44 (0)1494 782873 Email: admin@bdia.org.uk

HPN healthcare professionals network a dbg company

Dental Nurses, you'll love the Healthcare Professionals Network

- Online Member's Area
- Exclusive Chat Forum
- 450 Hours of E-Learning
- DCP Focused Job Board

...all this is yours for £49.95 per year.

- Add basic duties indemnity insurance for £53*
- Add extended duties indemnity insurance for £63.60*

How does your current membership network measure up?

fabyouless Beauty every day

The first 500 people to join HPN will receive a fabyouless card worth £49.95 absolutely **FREE!**

It's the hottest card on the market exclusively for beauty, hair and fitness!

- 25% off or 2 for 1 at venues across the country
- Use your card as often as you like and save money every time
- Book direct via your mobile, tablet or computer
- Blogs, news, trends, tips, advice and inspiration

Sign up with us today and start saving:

www.thedbg.co.uk/hpnsignup

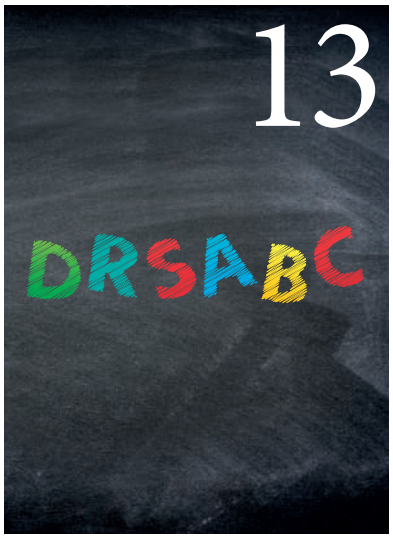
*supplied by Lloyd and Whyte Insurance

www.nature.com/bdjteam

June 2014

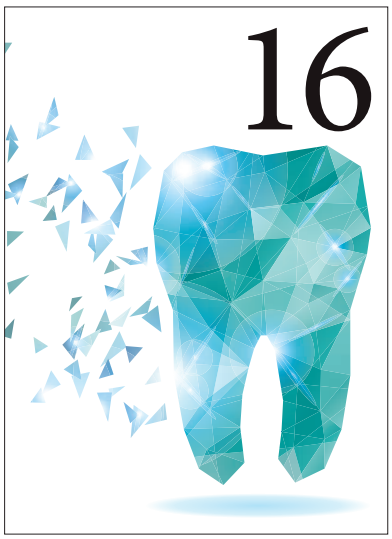
CPD: ONE HOUR

Highlights



Regulars

In this issue



Training Essentials

BDA
British Dental Association

Courses for the whole dental team

Meeting all your verifiable and CORE CPD requirements

Oral cancer: the dental team's responsibility CORE
LONDON - 06/06/2014

A team approach to effective paediatric care
LONDON - 27/06/2014

An IRMER course in dental radiography and radiation protection CORE
BRISTOL - 27/06/2014

Online marketing and social networking
LONDON - 04/07/2014

Law, ethics and record keeping CORE
LONDON - 04/07/2014

Performance appraisals
LONDON - 04/07/2014

Tax and financial planning
LONDON - 11/07/2014

Handling complaints and improving communication skills CORE
LONDON - 18/07/2014

@BDAEvents

www.bda.org/training | 020 7563 4590 | events@bda.org

Ed's letter

Welcome to the June issue of *BDJ Team*! This is the fourth issue of *BDJ Team*, and so far I've only had one letter! Get scribbling (well, typing) DCPs, as I'd love to hear from you. To kick things off, here is letter number one on a very important topic.

Dear Kate, I have recently become aware of the removal of Occupational Health facilities for dental staff in our area, meaning that we now have to source these facilities privately at a cost to the practice. I feel utterly disgusted at this decision, which I might add has not been implemented across the country. Should we just sit back while yet another unfair system is imposed on us without any information or consultation with those affected? Why are certain areas targeted and others not? In light of this, and not to mention the huge implications this could have for dental staff as far as their health is concerned, I have created a petition on the government website and would really like the dental profession to stand up to this decision and fight it. I would like to remind everybody of a previous letter published in Vital*: www.nature.com/vital/journal/v11/n1/full/vital1743.html and also to direct readers to my petition in the hope that we can spread the word: http://epetitions.direct.gov.uk/petitions/65932.*

I think that this action is yet another indication of the increasing lack of understanding of the current state of UK dentistry and the growing problems and pressures faced by dental professionals. Are we really that insignificant that now we're not important enough to be protected while treating patients? With ever rising costs and ever decreasing funds, it's time we stood up to these decisions. As a profession we pay for professional registration, membership to professional organisations, indemnity insurance, CPD and now we will be required to pay privately to receive occupational health services, which are sure to be compromised when people need to be seen urgently. Why aren't UK dental staff entitled to fair treatment and protection just the same as other medical professionals? Time to take action and find our voices? I think so.

Jenny Newbrook, Practice Manager, Crewe

If you have something on your mind to do with dentistry in general or something you have read in *BDJ Team*, drop me an email at **bdjteam@nature.com.**

Kate

Kate Quinlan
Editor
k.quinlan@nature.com

bdjteam201453

THE TEAM

Cover
Photographer: Filip Gierlinski, Filskifoto
Mobile: 07859 078945
Email: filip@filskifoto.com

Editor-in-Chief
Stephen Hancocks OBE

Editor
Kate Quinlan

Production
Art Editor: Melissa Cassem
Production Editor: Esther McKeown
Digital Editions Production Controller: Emma Jones

Advertising
Advertising Sales Executive: Stephen Brown, +44 (0)20 7843 4729, stephen.brown@nature.com

Publishing
Publisher: Rowena Milan
British Dental Journal
The Macmillan Building
4-6 Crinan Street
London N1 9XW

LAST FEW DAYS FOR ADAM NOMINATIONS!

As this issue of *BDJ Team* is published online, there are just THREE DAYS left to enter the ADAM Awards 2014.

The Association of Dental Administrators and Managers (ADAM) invites entries for Practice Manager of the Year, Administrator of the Year and Treatment Co-ordinator of the Year, by the extended deadline of 30 June 2014. The winner in each category will receive a cheque for £500.

The ADAM Awards, sponsored by Denplan, are presented to individuals within the dental practice administration team who demonstrate commitment to their ever-changing roles. The 2013 winners were Lisa Parker, Karen Wheeler and Clare Maidlow.

Individuals may only enter one award category, and the entry form includes completing a personal statement on what singles your practice out from the competition in no more than 750 words. For more details and to download the form, visit **http://adam-aspire.co.uk/news-and-events/34-news-and-events/212-adam-awards-2014.**

DENTAL CENTRE OPENS IN CONVERTED YORKSHIRE MANSION

A clinical dental technician (CDT) has joined forces with three dentists to open a state-of-the-art dental centre in a mansion house in Yorkshire.

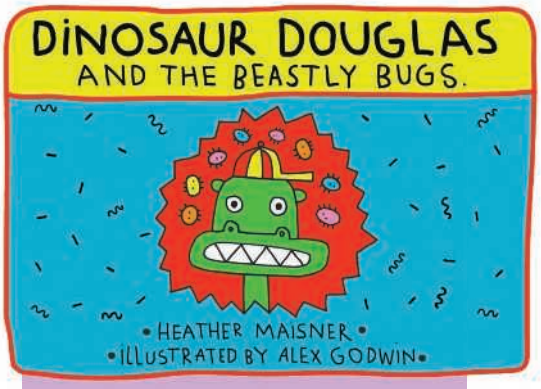
CDT Mark Price and dentists Donald Sloss, Mark Willings, Jon Swarbrigg will offer the very latest in dental treatments as well as training for dentists across the country at Dental Excellence, in the grounds of Harewood Estate, located between Leeds and Harrogate.

Nearly £2 million has been invested to convert the once derelict property and provide a new establishment for dental excellence, which features a helicopter landing pad within the Harewood estate.

TOP UP YOUR DECON SKILLS

Infection Prevention 2014 will be held in the SECC Glasgow from 29 September to 1 October, offering delegates the latest in infection prevention research, education and expertise. To view the programme visit www.ips.uk.net and click on the conference icon on the homepage.

Do you have a news story that you would like included in BDJ Team*? Send your press release or a summary of your story to the Editor at bdjteam@nature.com.*



DINOSAUR DOUGLAS TACKLES DENTAL CARIES

Hammersmith & Fulham Council in London have sponsored the publication of *Dinosaur Douglas and the beastly bugs* to help drive down the rate of dental caries in young people.

Dinosaur Douglas is an 'expert toothbrusher with a bright white smile', created by children's author Heather Maisner. The book weaves evidence-based messages about diet and toothbrushing into an engaging, rhyming story with colourful illustrations. Its publication coincided with the British Dental Health Foundation's National Smile Month 2014.

Three thousand copies of Heather's book have been given out to children in nursery and reception classes across Hammersmith and Fulham along with a toothbrush and toothpaste, and copies have also been given to local libraries and children's centres.

Twenty-eight percent of five-year-olds in Hammersmith and Fulham have decayed, missing or filled teeth, and tooth decay is the top cause for child hospital admissions in the area.

The book was launched on 'Healthy Teeth Day', 11 June, at Melcombe Children's Centre in Hammersmith. At the event, oral health experts from Central London Community Healthcare NHS Trust demonstrated mouth care techniques to parents and children and explained the importance of good brushing and other bedtime routines, such as reading to children. www.nhs.uk/livewell/dentalhealth

Did your dental practice get involved with National Smile Month? Email bdjteam@nature.com

MIKE IS NEW DTA PRESIDENT

Prior to the Tech Show, held in Coventry in mid-May, the Dental Technologists Association (DTA) announced the appointment of Mike McGlynn as President, the successor to Barry Appleby.

Mike qualified at Matthew Boulton College Birmingham where he gained a City and Guilds Final Certificate in 1973 and City and Guilds Advanced in Ceramics, Crown and Bridge in 1975. He worked at the Central Dental Clinic, Wolverhampton and Birmingham Dental Hospital before taking up a post as Lab Manager at a commercial dental laboratory in Hong Kong.

On returning to the UK Mike helped set up a successful dental lab which ultimately was taken over by a larger group. Mike was appointed Head of Dental Production Laboratories at Bristol Dental Hospital in 2007.

Mike has been a member of the Executive team of DTA for three years. He is also a member of the British Institute of Dental and Surgical Technologists.

Mike said: 'I'm delighted and honoured to be taking over as DTA President, especially so as this year marks [DTA's] 25th anniversary, and I look forward to working with colleagues on the Executive team to support our members.'

TECHNICIANS AND LAB OWNERS FLOCK TO TECH SHOW

Hundreds of dental technicians, laboratory owners and clinical dental technicians (CDTs) attended the British Dental Industry Association (BDIA) Tech Show in May, a new venture for the BDIA run in partnership with the Dental Technologists Association (DTA).

Delegates sampled a selection of over 60 live demonstrations and talks, hands-on masterclasses, a trade exhibition and lectures from world class speakers at Coventry's Ricoh Arena.

Tech Show offered arguably the widest scope of any technician-facing event in the UK for many years. DTA President Mike McGlynn said: 'We were delighted to be part of Tech Show which offered so many fascinating and insightful sessions to visitors, combined with the opportunity to meet their favourite suppliers, watch the product demonstrations and learn about many new products and systems'.

Tech Show exhibitors took full advantage of the event with a range of new product launches and an array of stands and product displays, including the milling, digital printing and imaging technologies that are revolutionising laboratory work.

BDIA Executive Director Tony Reed said: 'Tech Show indicates that there are clear distinctions between what different members of the dental team want and require from dental shows. Our Tech Show experience demonstrated that technicians are interested in close-up, practical demonstrations with interactive activities and hands-on involvement'.

Did you attend Tech Show? What did you think of the event? Email bdjteam@nature.com.

DCPs MAD FOR MANCHESTER 2014

Over 1,000 dental care professionals (DCPs) attended this year's British Dental Conference and Exhibition in Manchester: record attendance for both the Thursday and the Friday of the event.

The lecture programme at the conference included a number of sessions specifically aimed at the dental team, including: how skill mix can be used to increase success and profitability; working safely within your scope of practice; the new GDC standards; caring for patients with dementia; and safeguarding vulnerable children.

Visitors to the Exhibition had access to over 150 exhibitors as well as the Innovation Zone; BDA Museum cinema; the Training Essentials theatre and the live Demonstration theatre.

In the Training Essentials theatre the dental team had a lot to choose from with over 20 sessions covering core CPD subjects, regulatory updates and personal development. Highlights for DCPs included a session hosted by the British Association of Dental Therapists (BADT) looking at the latest research into the role DCPs can play in screening for common oral diseases, and sessions on dental photography, periodontics, radiography, and child safeguarding.

Thursday evening drinks in the exhibition hall offered an opportunity to informally network with exhibitors whilst a sold out Friday night party saw guests enjoying the sounds of live band Hipster.

Planning has already begun for next year's event: 7-9 May 2015 in Manchester.

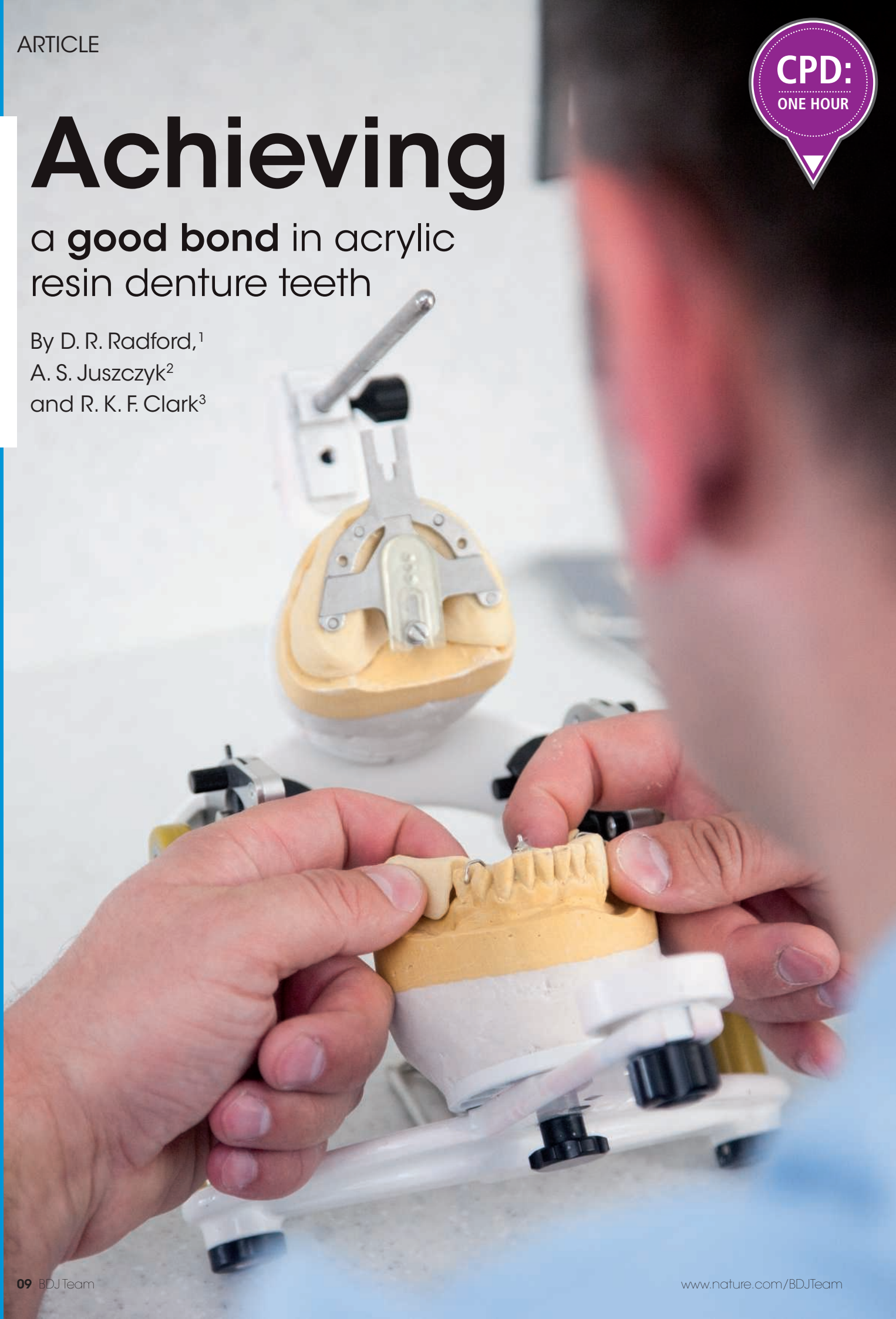
For photos of this year's event see www.facebook.com/thebritishdentalassociation.

CPD: ONE HOUR

Achieving

a **good bond** in acrylic resin denture teeth

By D. R. Radford,[1]
A. S. Juszczyk[2]
and R. K. F. Clark[3]



INTRODUCTION

Failure of the bond between denture teeth and base acrylic resin has been shown to be a problem in reviews of dentures made in the National Health Services of Britain and Northern Ireland.[1,2] The bond between acrylic resin denture teeth and the denture base has been described as unreliable, inconsistent and unpredictable[3] and there is no reason to suppose that this problem is limited to the British National Health Service.

The optimal combination of acrylic resin denture tooth, denture base material, laboratory protocol and processing method has not yet been achieved.[4] The presence of strong or weak bonds within the same denture[5] and the number of aspects of this failure that appear in the literature suggests that this is a multi-factorial problem related to a process which is technique sensitive.

The bond between polymerised poly-methylmethacrylate (PMMA) and additional PMMA is thought to be formed by penetration of monomer,[6,7] which then polymerises. The resulting polymer chains either intertwine with existing polymer chains forming an essentially physical bond, or in favourable circumstances may form contiguous chains with the previously polymerised PMMA of the denture teeth.

In practical terms all factors involved need to be understood and a protocol needs to be developed and employed in dental laboratories, which maximises factors that are likely to facilitate a stronger bond while minimising those factors, which may lead to a weaker bond.

FACTORS MAXIMISING BOND STRENGTH

Tooth selection

There are three types of acrylic resin denture teeth in common use: homogenous, layered and polycarbonate coated. The type of denture teeth used has been shown to affect the bond strength.[8-11] Homogenous acrylic resin teeth had higher bond strength than crosslinked teeth.[12] A significant difference in bond strength between base acrylic resin and the inner and outer layer of multilayered teeth[12] suggested that in cases where significant reduction of the ridgelap may be required, such as for example in implant supported overdentures, homogenous teeth should be selected.

Recommendation: select teeth to ensure sufficient bonding region even after some or significant tooth removal in the ridgelap region.

Selection of base acrylic resin

Of the different forms of PMMA denture base materials heat cured resin has been shown to give the highest bond strength followed by microwave-cured and the weakest bond was found in pour-type self-cured resin.[9,12-15]

Recommendation: use heat cured acrylic resin denture base material.

Chemical preparation of the ridgelap of the denture teeth

Self-cure monomer[6,7] has been shown to penetrate the ridgelap surface of the denture teeth and contribute to an improvement in bonding.[23-25] The balance of probabilities suggests that heat-cured monomer does the same.

Recommendation: drip monomer on the ridgelap before packing (Fig. 2).

Monomer/polymer ratio

There have been very few investigations into the effect different monomer/polymer ratios have on the strength of the bond between denture teeth and the base acrylic resin. However, following the manufacturers' instructions regarding the monomer/polymer ratio and packing early rather than late seemed to have a slight advantage.[26]

Recommendation: follow the manufacturers' instructions.

> *'IN PRACTICAL TERMS ALL FACTORS INVOLVED NEED TO BE UNDERSTOOD AND A PROTOCOL NEEDS TO BE DEVELOPED IN DENTAL LABORATORIES'*

Compatibility of teeth and base acrylic

A study on the effect of different curing cycles suggested that a stronger bond might be achieved between acrylic resin denture base material and acrylic denture teeth when both are made by the same manufacturer.[16] A subsequent study[17] investigated the bond strength with three denture base acrylic resin denture base materials and acrylic denture teeth when both are made by the same manufacturer.

There was a trend that the bond strength achieved between the teeth and base material from the same manufacturer was higher than the unmatched pairs but statistical significance was not achieved.

Recommendation: select denture teeth and acrylic resin base material from the same manufacturer.

Physical preparation of the ridgelap of the denture teeth

Removing the glaze from the ridgelap has been shown to improve the bond strength.[11,18] However, more elaborate modification of the ridgelap has shown little extra improvement probably because base acrylic in the grooves was too thin to provide added strength.[19-21] However, a recent study[22] has shown some improvement in strength using substantial groves. The probability is that the improvement is in physical retention rather than strength of the chemical bond.

Recommendation: remove the glaze from the ridgelap (Fig. 1).

Processing cycle

Differences in bond strength between denture teeth and acrylic resin denture base material result from different curing cycles. Short cycles resulted in the lowest bond strength whereas the manufacturers' recommended cycles produced the highest bond strength.[16,17]

Recommendation: follow the manufacturers' recommended curing cycle.

Cooling regime

A long cooling cycle has been shown to minimise distortion in heat cured acrylic resin denture bases and a further 24 hour rest before deflasking has been shown to further reduce stress in the denture.[27,28] So far attempts to demonstrate an effect of a cooling regime on the strength of the denture tooth denture base bond have been inconclusive.[29] However, given that the overall dimensional accuracy of the processed denture is affected by the cooling cycle and it is possible that slow cooling would be expected to set up fewer stresses, not only in the denture but across the bond between the teeth and the base, it would seem to be sensible to use a slow cooling regime.

Recommendation: cool slowly and allow to rest at room temperature before deflasking.

[1] *Senior Lecturer/Honorary Consultant in Restorative Dentistry, King's College London Dental Institute & Director of Clinical Studies, Senior Lecturer in Integrated Dental Education and Multiprofessional Care, University of Portsmouth Dental Academy;* [2]*Senior Dental Technician, Barts and the London NHS Trust;* [3]*Emeritus Professor of Prosthetic Dentistry, King's College London Dental Institute*

Fig. 1 The ridgelap glaze being removed from a tooth before setting up

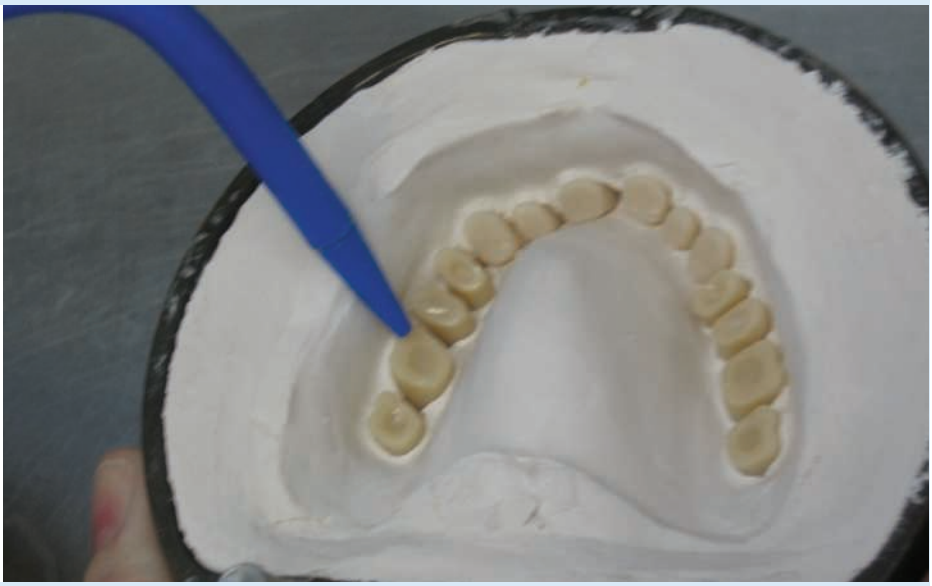


Fig. 2 Monomer being dripped on to the ridgelaps of the teeth

Fig. 3 Removing all traces of mould seal from the ridgelaps of the denture teeth

FACTORS MINIMISING BOND STRENGTH

Wax contamination from the ridgelaps of the denture teeth

Most studies agree that any contamination of the ridgelap surface will decrease the bond strength.[30-35] Wax elimination and ensuring that teeth are uncontaminated and free of any debris has been found to be more likely to achieve adequate bonding strength than any mechanical preparation, which could be applied to the ridgelap surfaces of the teeth. Wax contamination of the tooth ridgelap surface has been found to be a cause of significantly reduced bond strength.[35] To obtain optimal wax elimination a minimum of 90 °C water temperature should be used at the 'boiling out stage'. At a lower temperature an eliminating agent should be used.[36,37]

Recommendation: remove all traces of wax.

Sodium alginate mould seal elimination from the ridgelaps of the teeth

No consensus appears to have been reached regarding contamination with sodium alginate mould seal.[33] Some studies[33,35] have concluded that contamination by sodium alginate mould seal had no significant effect on the bond strength. However, others have concluded that sodium alginate mould seal did reduce the bond strength. Common sense would perhaps suggest that anything other than an organic solvent might form a barrier.

Recommendation: avoid sodium alginate mould seal contact with the ridgelaps and remove all traces of mould seal from the ridgelaps (Fig. 3).

DISCUSSION

Importance has been attributed to many factors involved in forming a bond between denture teeth and base acrylic resin and in each case there is evidence that each factor plays a part but in some cases the evidence may not seem to be strong. However, there is general consensus that failure of the bond between the denture teeth and the base acrylic resin may have many causes, which may act separately or together to cause failure. It would seem sensible therefore to adopt a technique which eliminates as many possible causes of failure as possible. It follows that the dental technician's attention to detail is fundamental to achieving a good bond. With the increasing use of implant supported overdentures, the higher forces both in occlusal and lateral directions that patients apply to prostheses, and often the reduced intermaxillary space, this issue which has been identified and researched over a period of 60 years is still relevant in the clinic-laboratory interface.

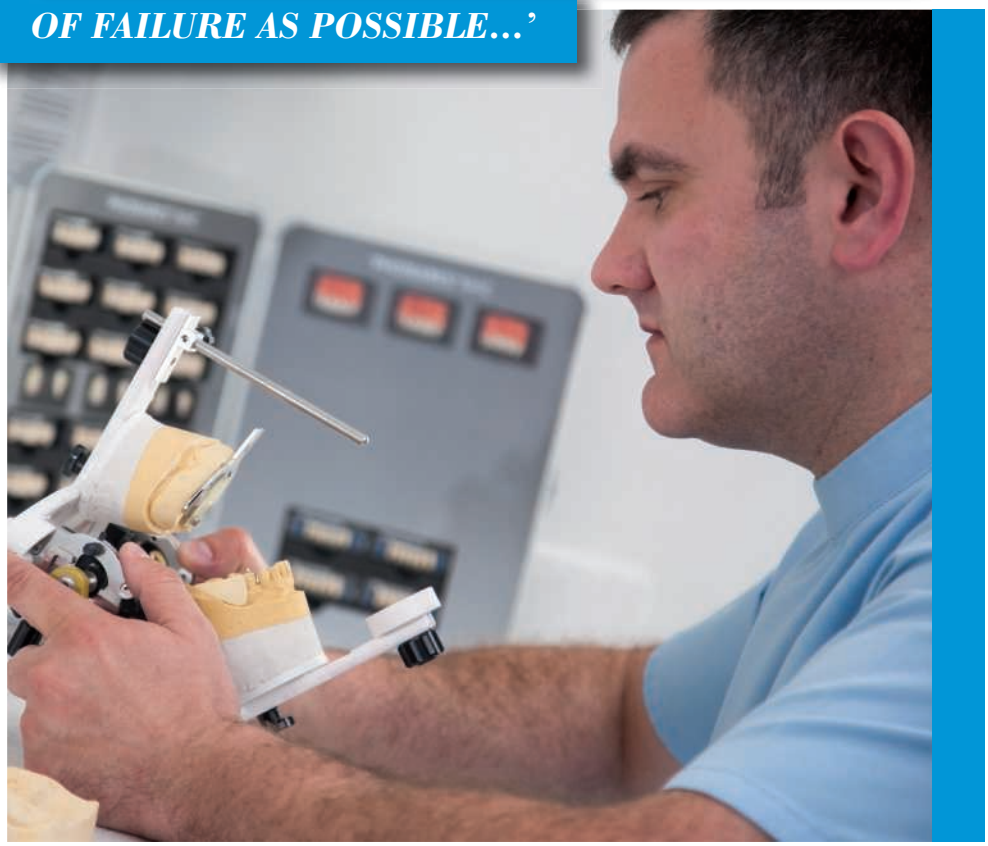
CONCLUSION

The following suggestions for best practice are recommended:

1. Select appropriate denture teeth
2. Select base acrylic from same manufacturer as the denture teeth
3. Remove the glaze from ridgelaps of the denture teeth
4. Remove all traces of wax from the ridge laps of the denture teeth
5. Remove all traces of mould seal from the ridgelaps of the denture teeth
6. Apply monomer to the ridgelaps of the denture teeth before packing the base acrylic dough
7. Use the manufacturers' recommended liquid/powder ratio
8. Follow the manufacturers' recommended curing cycle
9. Allow the flask to cool slowly before deflasking.

1. Cunningham J L. Bond strength of denture teeth to acrylic bases. *J Dent* 1993; **21:** 274–280.
2. Darbar U R, Huggett R, Harrison A. Denture fracture a survey. *Br Dent J* 1994; **176:** 342–345.
3. Zuckerman G R. A reliable method for securing anterior denture teeth in denture bases. *J Prosthet Dent* 2003; **89:** 603–607.
4. Schneider R L, Curtis E R, Clancy J M. Tensile bond strength of acrylic resin denture teeth to a microwave or heat-processed denture base. *J Prosthet Dent* 2002; **88:** 145–150.
5. Cunningham J L, Benington I C. A survey of the pre-bonding preparation of denture teeth and the efficiency of dewaxing methods. *J Dent* 1997; **25:** 125–128.
6. Carter D C, Clark R K F, Sherriff M. *Diffusion of methylmethacrylate into poly(methylmethacrylate).* p 8. Proc. BSSD, 1996.
7. Carter D C. *The effect of surface preparation on the bond developed between acrylic resin denture base materials.* London: MSc, 1996.
8. Anderson J N. The strength of the joint between plain and copolymer acrylic teeth and denture base resins. *Br Dent J* 1958; **104:** 317–320.
9. Huggett R, John G, Jagger R G, Bates J F. Strength of the acrylic denture base tooth bond. *Br Dent J* 1982; **153:** 187–190.
10. Suzuki S, Sakoh M. Shiba A. Adhesive bonding of denture base resins to plastic denture teeth. *J Biomed Mater Res* 1990; **24:** 1091–1103.
11. Kawara M, Carter J M, Ogle R E, Johnson R R. Bonding of plastic teeth to denture base resins. *J Prosthet Dent* 1991; **66:** 566–571.
12. Albarghouty H, Juszczyk A S, Radford D R, Clark R K F. Tensile bond strength of heat and self-cured acrylic denture base resins to the inner and outer layers of two-layered acrylic resin denture teeth. *Eur J Prosthodont Restor Dent* 2007; **15:** 81–83.
13. Polyzois G L, Dahl J E. Bonding of synthetic resin teeth to microwave or heat activated denture base resin. *Eur J Prosthodont Restor Dent* 1993; **2:** 41–44.
14. Takahashi Y, Chai J, Takahashi T, Habu T. Bond strength of denture teeth to denture base resins. *Int J Prosthodont* 2000; **13:** 59–65.
15. Amin W M. Durability of acrylic tooth bond to polymeric denture base resins. *Eur J Prosthodont Restor Dent* 2002; **10:** 57–61.
16. Dalal A, Juszczyk A S, Radford D R, Clark R K F. Effect of curing cycle on the tensile strength of the bond between heat cured denture base acrylic resin and acrylic resin denture teeth. *Eur J Prosthodont Restor Dent* 2009; **17:** 146–149.
17. Patil R, Juszczyk A S, Radford D R, Clark R K F. Is the bond between acrylic resin denture teeth and denture base resin stronger if they are both made by the same manufacturer? *Eur J Prosthodont Restor Dent* 2010; **18:** 39–41.
18. Civjan S, Hugett E F, de Simon L B. Modifications of the fluid resin technique. *J Am Dent Assoc* 1972; **85:** 109–112.
19. Cardash H S, Liberman R, Helft M. The effect of retention grooves in acrylic resin teeth on tooth denture-base bond. *J Prosthet Dent* 1986; **55:** 526–528.
20. Cardash H S, Applebaum B, Baharav H, Liberman R. Effect of retention grooves on tooth-denture base bond. *J Prosthet Dent* 1990; **64:** 492–496.
21. Vallittu P K. Bonding of resin teeth to the polymethyl methacrylate denture base material. *Acta Odontol Scand* 1995; **53:** 99–104.
22. Kaur P, Sandhu N, Gupta G, Sandhu S S. Influence of retention grooves in acrylic resin teeth on tooth-base bond strength. *Indian J Dent Sci* 2013; **5:** 32–35.
23. Sørensen S E, Fjeldstad E. Bonding of plastic teeth to acrylic-resin denture-base material. *J Dent Res* 1961; **40:** 776.
24. Rupp N W, Bowen R L, Paffenbarger G C. Bonding cold-curing denture base acrylic resin to acrylic resin teeth. *J Am Dent Assoc* 1971; **83:** 601–606.
25. Chung W C, Clark R K F, Darvell B W. The bonding of cold-cure acrylic resin to acrylic denture teeth. *Aust Dent J* 1995; **40:** 241–245.
26. Alshahrani A M, Spithourakis S, Juszczyk A S, Radford D R, Clark R K F. The effect of monomer/polymer ratio and time between mixing and packing of heat cured acrylic resin denture base material and bond assisting agents on the bond strength to acrylic resin denture teeth. *Eur J Prosthodont Restor Dent* 2012; **20:** 131–134.
27. Komiyama O, Kawara M. Stress relaxation of heat activated acrylic denture base resin in the mould after processing. *J Prosthet Dent* 1998; **79:** 175–181.
28. Moturi B, Juszczyk A S, Radford D R, Clark R K F. Dimensional change of heat cured acrylic resin dentures with three different cooling regimes following a standard curing cycle. *Eur J Prosthodont Restor Dent* 2005; **13:** 159–163.
29. Aslam K. *Effect of curing regime on bond between acrylic resin and acrylic resin denture teeth.* London: MSc, 2007.
30. Schoonver I C, Fisher T E, Serio A F, Sweeney W T. Bonding of plastic teeth to heat-cured denture base resins. *J Am Dent Assoc* 1952; **44:** 285–287.
31. Spratley M H. An investigation of the adhesion of acrylic resin teeth to dentures. *J Prosthet Dent* 1987; **58:** 389–392.
32. Catterlin R K, Plummer K D, Gulley M E. Effect of tinfoil substitute contamination on adhesion of resin denture tooth to its denture base. *J Prosthet Dent* 1993; **69:** 57–59.
33. Cunningham J L. Bond strength of denture teeth to acrylic bases. *J Dent* 1993; **21:** 274–280.
34. Cunningham J L, Benington I C. A new technique for determining the denture tooth bond. *J Oral Rehabil* 1996; **23:** 202–209.
35. Thean H P, Chew C L, Goh K I. Shear bond strength of denture teeth to base: a comparative study. *Quintessence Int* 1996; **27:** 425–428.
36. Cunningham J L, Benington I C. A survey of the pre-bonding preparation of denture teeth and the efficiency of dewaxing methods. *J Dent* 1997; **25:** 125–128.
37. Cunningham J L, Benington I C. An investigation of the variables which may affect the bond between plastic teeth and denture base resin. *J Dent* 1999; **27:** 129–135.

'IT WOULD SEEM SENSIBLE TO ADOPT A TECHNIQUE WHICH ELIMINATES AS MANY POSSIBLE CAUSES OF FAILURE AS POSSIBLE…'



The full version of this article was originally published in the BDJ *on 21 February 2014 (**216:** 165-167) as* The bond between acrylic resin denture teeth and the denture base: recommendations for best practice.

VERIFIABLE CPD

There is one hour of verifiable CPD associated with this article. To take part, go to www.nature.com/bdjteamcpd.

bdjteam201461

Medical emergencies in dental practice: *the five P's*

By Vipul Patel[1]

Medical emergencies in dental practice are an uncommon event, especially when you consider the amount of dental visits/consultations that are delivered by the profession throughout the world on a daily basis. However, when they do occur they often create enormous anxiety amongst dental professionals despite these individuals being more than capable and professionally trained to deal with such eventualities. As patient and professional expectations increase, we need to ensure we manage any medical emergency occurring in dental practice - often under great stress -effectively and efficiently.

Who ate all the pies?

The phrase 'who ate all the pies?' reflects a comment made by a professional colleague when asked about patients at risk of medical emergencies in dental practice. His reply to the question about who our high risk patients are was … 'the fat ones'. Not very sensitive. Anyone who has seen me lecturing will know that I am one of these 'fat ones' … although 'big boned' is what I would like to think. The point to make is please do not judge someone only by the way they look and wrongly assume all patients who are obese or overweight will have a medical emergency, as often it will be the patients you least expect. Although body mass index is a risk factor for heart disease your truly vulnerable patients for emergencies are those at the extremes of the age range, patients with concurrent diseases or poly-pharmacy and those recovering from major surgery or illnesses.

This article is not meant to be a detailed presentation of all medical emergencies in dental practice and their management, but to provide some simple hints and tips to

[1]*GDP, Kent and Medical Emergency Trainer*

managing medical emergencies by using the five P's: **P**lan, **P**repare, **P**redict, **P**rofessional, **P**ray.

Plan

As a healthcare professional and as a dental practice team you need to ruthlessly plan for medical emergencies as they will occur, however uncommon, and often when you least expect them and are least prepared for them. By having *written protocols* for the management of common emergencies and resuscitation, and undertaking periodic in-house team *simulations* and role play, you will practise this essential skill.

One positive way to continually manage our risk is to identify weaknesses in our systems and our processes. This is best done through *reflective learning* and a critical appraisal of previous emergencies. This will allow us to be optimally prepared for any emergency.

Prepare

We must have a robust *medical history questionnaire*, which specifically asks the questions we want the answers to. Remember patients will often only answer the questions asked and with the shortest of answers. Also, note that the default answer is often 'no' whenever we come across a question we don't understand.

After completion you must go through the questionnaire with the patient with prompts to extract further relevant details ... akin to a detective probing his main suspect – although please don't be too ruthless! Ensure signed medical history questionnaires are updated at least annually and the patient is asked about changes to their medical status at each visit. However, be careful not to believe everything that you are told as people are known to lie and not everything is always as it seems.

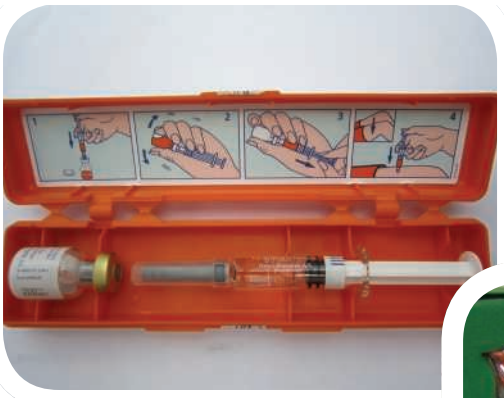
Apple or orange... You decide!

There is no statutory list of *medical emergency equipment* for dental practice but guides to best practice. Each practice is different in its skill mix and its level of service provision to its patients. However, you must ensure you have the correct quantity and quality of medical emergency equipment for your patients' needs, which is accessible, functional and within its use-by date. Do check all *medical emergency drugs* carefully for use-by dates and check they are stored correctly. Ensure the team has the knowledge and skills to deliver the correct dose/quantity of drug quickly by the most appropriate route. However, most importantly make sure everyone knows where the medical emergency equipment is kept, how to use the equipment and who is named responsible to replenish the stock. *Audit* this inventory to ensure compliance.

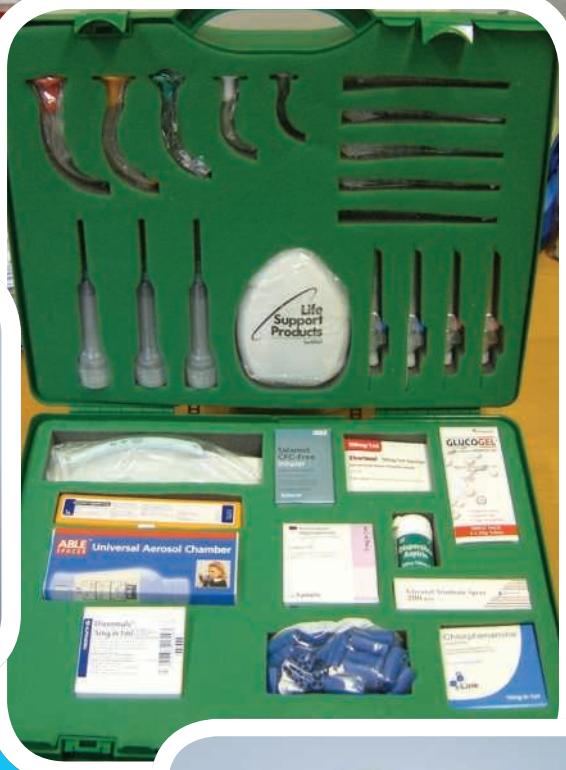
Figure 1 shows an example of a medical emergency kit and Figure 2 shows a glucagon injection kit. Figure 3 is a bag-valve-mask (BVM) apparatus.

For patients with a certain condition it may be advisable to ask the patient to bring their *own medication* in at each visit so if it is needed the patient is familiar with its use and correct delivery and it is more likely to be in-date. This could be relevant to patients with asthma who use an inhaler (Fig. 4) or angina patients using glyceryl trinitrate (GTN) spray under their tongue (Fig. 5).

Fig. 3 Bag-valve-mask (BVM) apparatus



Above
Fig. 2 Glucagon injection kit



Right
Fig. 1 Medical emergency kit

Fig. 4 Asthma inhaler

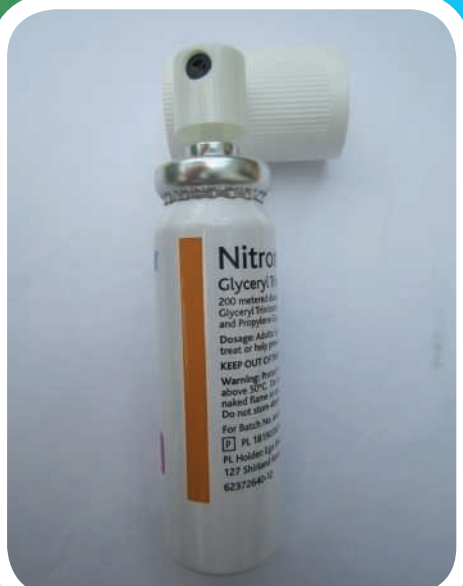


Fig. 5 Glyceryl trinitate (GTN) spray

'AS A DENTAL PRACTICE TEAM YOU NEED TO RUTHLESSLY PLAN FOR MEDICAL EMERGENCIES AS THEY WILL OCCUR, HOWEVER UNCOMMON, AND OFTEN WHEN YOU LEAST EXPECT THEM AND ARE LEAST PREPARED FOR THEM.'

Dr's ABC:

D Danger (check for danger or potential risks)
R Response (assess patient consciousness)
S Shout for help
A Airway (open the airway with manoeuvres like head tilt/chin lift)
B Breathing (look, listen and feel for normal breathing for ten seconds – if not breathing start cardiopulmonary resuscitation)
C Circulation (look for signs of bleeding and shock, check pulse)

Professional

As dental healthcare professionals you have a *duty of care* to your patients and this should be your ultimate responsibility. Maintain your professional status with pride. Ensure you meet your *core CPD* requirements for this essential subject, which must include training in resuscitation and basic life support. Become confident in diagnosing a medical emergency and managing them with the professional expertise you possess and the skills that you have developed. You can use the protocols that you have written up and practised repeatedly as a team. Be *confident* in yourself and give the patient the confidence in you and your team … this is more likely to result in a positive outcome.

Pray

For those who are not religious, I'm sorry, but you're left with only 4 P's. For the rest of us it's never a bad thing to have some *divine help*. God bless.

Good luck and remember the quote by Oscar Wilde: 'you know more than you think you know, just as you know less than you want to know'.

Include reading this article in your non-verifiable (general) CPD - just make a note of it in your personal development plan or record.

Predict

Look at your patients: not a glance but a good look, often easier when greeting them at arrival. Look for *subtle signs or salient symptoms*, which may suggest the early stages of a medical emergency. The patient who is flushed or sweating, and the patient who is anxious and in pain, could easily be masking some deeper medical problems. Ask questions now or potentially delay diagnosing a medical emergency.

Be confident to quickly and accurately assess the *basic parameters of health*, namely pulse rate/rhythm and breathing rate/pattern, to ensure vital clinical signs are not overlooked and management delayed. If you are not happy with the patient's medical state delay dental treatment, unless absolutely necessary, and use the time to help the patient, which may mean calling emergency services or the patient's general medical practitioner.

If you are faced with an ensuing medical emergency recall the simple acronym that you have learned many times to help you remember what to do and in which order:

'BE CONFIDENT IN YOURSELF AND GIVE THE PATIENT CONFIDENCE IN YOU AND YOUR TEAM…'

Vipul will be delivering the BDA Training Essentials course *Management of medical emergencies for the whole dental team* in London on Friday 12 September. This course offers five hours of verifiable core CPD. Call 020 7563 4590 to book your place.

bdjteam201462

Is CAD/CAM the end for dental labs?

John Battersby examines a topic covered extensively at the Dental Technician Forum at IDEM Singapore 2014.

Buzz words like digital dentistry, CAD/CAM, intraoral scanning, extraoral scanning, 3D milling and 3D printing are reverberating through the dental industry these days. It seems whenever two or more dental professionals get together it's not long before one or all are being discussed.

So it's hardly surprising that when nearly 8,000 dental professionals from every aspect of the industry got together in Singapore at the beginning of April for the premier dental event of Asia-Pacific, IDEM Singapore 2014, the exhibition halls also rang with them. They were also to be heard in many of the lectures presented as part of the scientific conference but perhaps where they were most frequently heard was in the lecture halls and coffee break rooms of the Dental Technician Forum.

While everyone seems to agree that 'the future is now', as the theme and tagline for this year's IDEM Singapore so aptly put it, there was also some ambivalence and even trepidation toward the future that seems to be knocking on the doors of Asia's dental labs and surgeries.

The question worrying some, especially the older and more established labs and technicians, is whether 'the future's' arrival is sounding the death knell of the traditional, craftsmen-based prosthetics and restoration business. Or, is it heralding a boom that will see more demand in Asia's developing economies than could ever have been dreamed of 20 or even ten years ago?

The doomsday scenario in the back of many technicians' minds is that one day the advances in scanning technologies, coupled

with ever more powerful and capable software, feeding virtual 3D models to ever cheaper and more accurate 3D printers, will mean dentists will be able to handle their own manufacturing needs.

According to the manufacturers and purveyors of the various digital dental technologies, that day is already here. The technology is available to allow dentists to scan patients' teeth and create crowns for them while they wait. A process that traditionally took weeks can now in theory be done in an hour or two.

Instead of making a mould and sending it to a lab for scanning, a well-equipped dentist could use a variety of technologies from intraoral cameras to CBT to scan the teeth directly. The digitised scan could then be sent to an on-site milling or 3D printing machine to carve the crown from a block of porcelain or print it from resin while the patient relaxes in the waiting room and catches up on back issues of their favourite magazines. Then, after a little finishing and preparation work, the crown is ready for fitting and a satisfied patient is heading back to work.

It is a scenario that would definitely appeal to patients: a single visit with no need to wander around with a temporary crown for a couple of weeks offers them savings in both time and money. In theory it appeals to quite a few dentists too as they see an opportunity to cut out the mould and the middleman, the poor technician. But is it yet reality?

The short answer is no. Any lab owners or technicians that have been losing sleep over the prospect of the imminent loss of their livelihoods can relax. It is not that CAD/CAM is not going to revolutionise the industry - it certainly already is doing that and will continue to do so - but it is unlikely that it will do so in the hands of dentists.

'DENTISTS HAVE HAD ACCESS TO THE SCANNING TECHNOLOGY, COMPUTER POWER, AND EVEN DESKTOP MILLING MACHINES FOR 20 YEARS OR MORE BUT HAVE NOT ADOPTED IT EN MASSE.'

While 3D printing is still new, CAD/CAM isn't. In Europe, the UK and the US, dentists have had access to the scanning technology, computer power, and even desktop milling machines for 20 years or more but have not adopted it *en masse*. Even in the United States, the world's largest and most technically advanced dental market, only something like 8-10% of dental surgeries have in-house CAD/CAM facilities. Roughly one in ten of those don't use the equipment despite having made significant financial investments, usually because they found the learning curve too steep or were put off by early mishaps or clinical issues. The majority of those that do use the equipment only do so for single posterior crowns and still send the more complex posterior and all their anterior jobs to external labs. Or, they have hired their own in-house technicians to use the equipment to its full potential.

It is unlikely that the majority of the older dentists practising today, those with only 10-20 years before retirement, will be willing to change to these new technologies. While they might be at the stage of their careers where they are well established enough to afford it they are usually put off by the daunting learning curve required to master it. As two of the world's leading experts on the use of CAD/CAM technologies in dentistry, the Italian dentist brothers Andrea and Alessandro Agnini, pointed out during one of their lectures to technicians at IDEM Singapore, in their experience even when it came to intraoral scanning most dentists with 20 or more years' experience working with moulds found it hard to switch and usually prefer to stick with what they know, moulds.

The latest generation of recently graduated dentists and current students will be more comfortable with digital technology, as the Agninis have found at their training facility in Emilia Romagna, Italy. Student dentists, who had no experience of either moulds or 3D scanning technologies, preferred the latest high-tech methods for data acquisition and the ability it gave them to work more closely and interactively with technicians. However, while fresh graduates are comfortable with the latest scanning technology at the start of their careers, they are unlikely to have the capital to invest in in-house production facilities.

The Agninis can't imagine a future without highly skilled, artist technicians helping them to create the cutting-edge prosthodontics they are famous for. In summing up their last lecture on the final day of IDEM Singapore they assured the audience of technicians that as technology and materials advance and make more elaborate and complex restorations possible the role of the expert artisan technician will become increasingly important in delivering the best possible outcome for patients.

Dr Dobrina Mollova of the Centre for Advanced Professional Practices (CAPP) certainly does not think technology can replace skilled technicians: 'There will always be a need for technicians, for highly skilled professionals who are experts in the use of the machines that make the prosthodontics that modern dental practices rely on to stay in business. The machines and technologies they use may change from generation to generation but the need for experts to operate them will always remain. So, as long as technicians keep their skills and knowledge up to date they will always be a vital part of the dental team. 3D printing is already with us in dentistry and I am sure that as new materials and technologies develop, to exploit it, it will become more common place but like all the other new manufacturing technologies it will still need expert technicians to run it.'

Rather than being the death of the traditional dental lab, digital technologies and especially the latest materials and manufacturing technologies are likely to see a growing demand for prosthetics and restoration work as they bring them within reach of more people, especially the growing middle classes of the world's developing economies.

So it seems IDEM Singapore 2014 was correct to say 'The future is now' and dental labs and technicians need to embrace that future and make it their own.

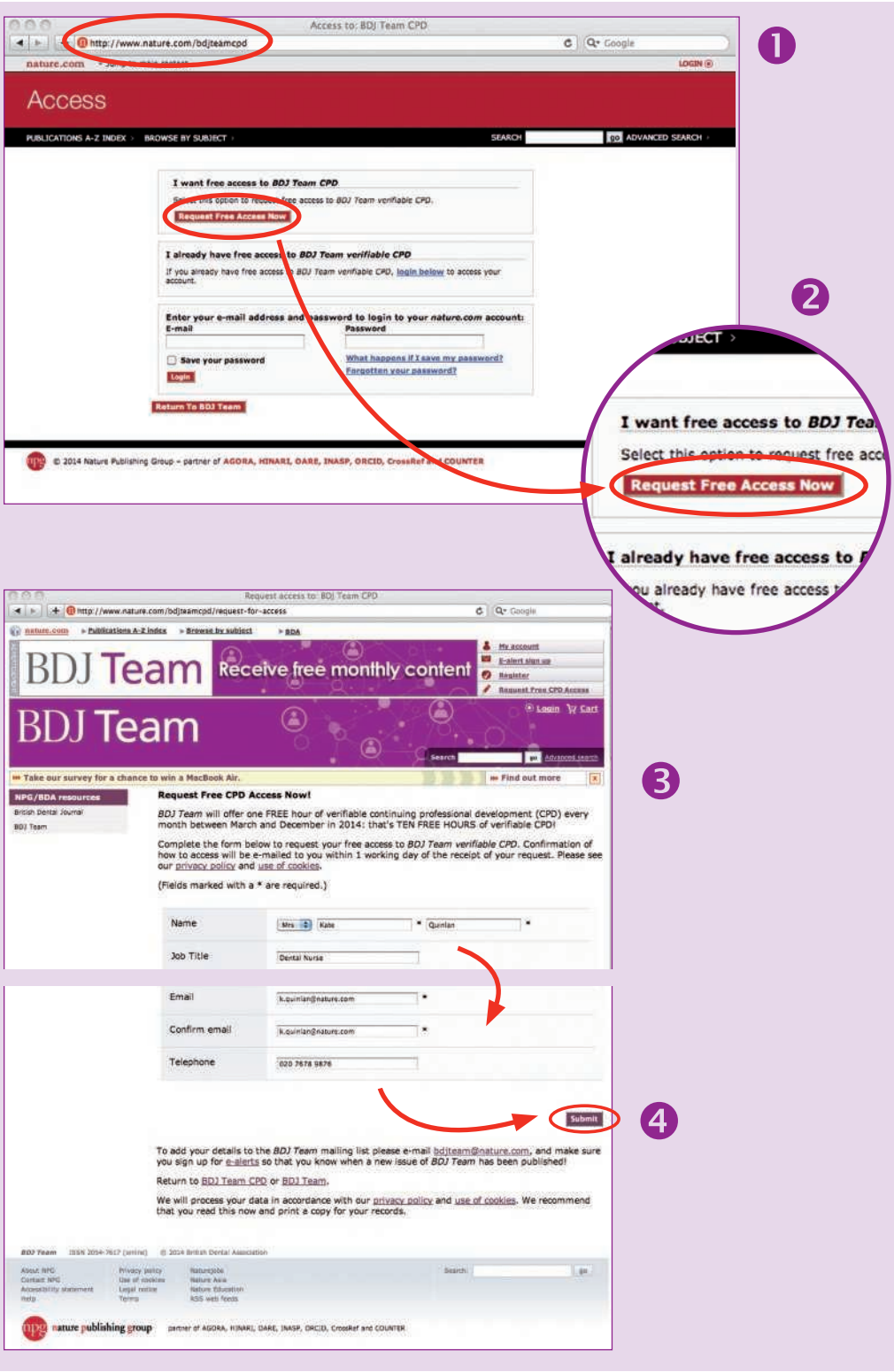
What do you think? Do you think digital dentistry is a new beginning for dental technicians? Send a letter to the editor of BDJ Team *or visit the BDJ Team Facebook page to comment: www.facebook.com/bdjteam.*

bdjteam201463

Tutorial: How to access *BDJ Team CPD*

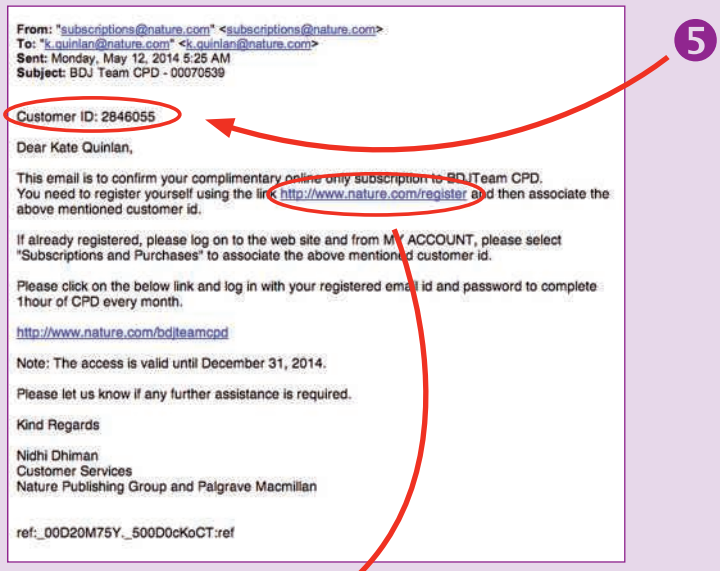
CPD: ONE HOUR

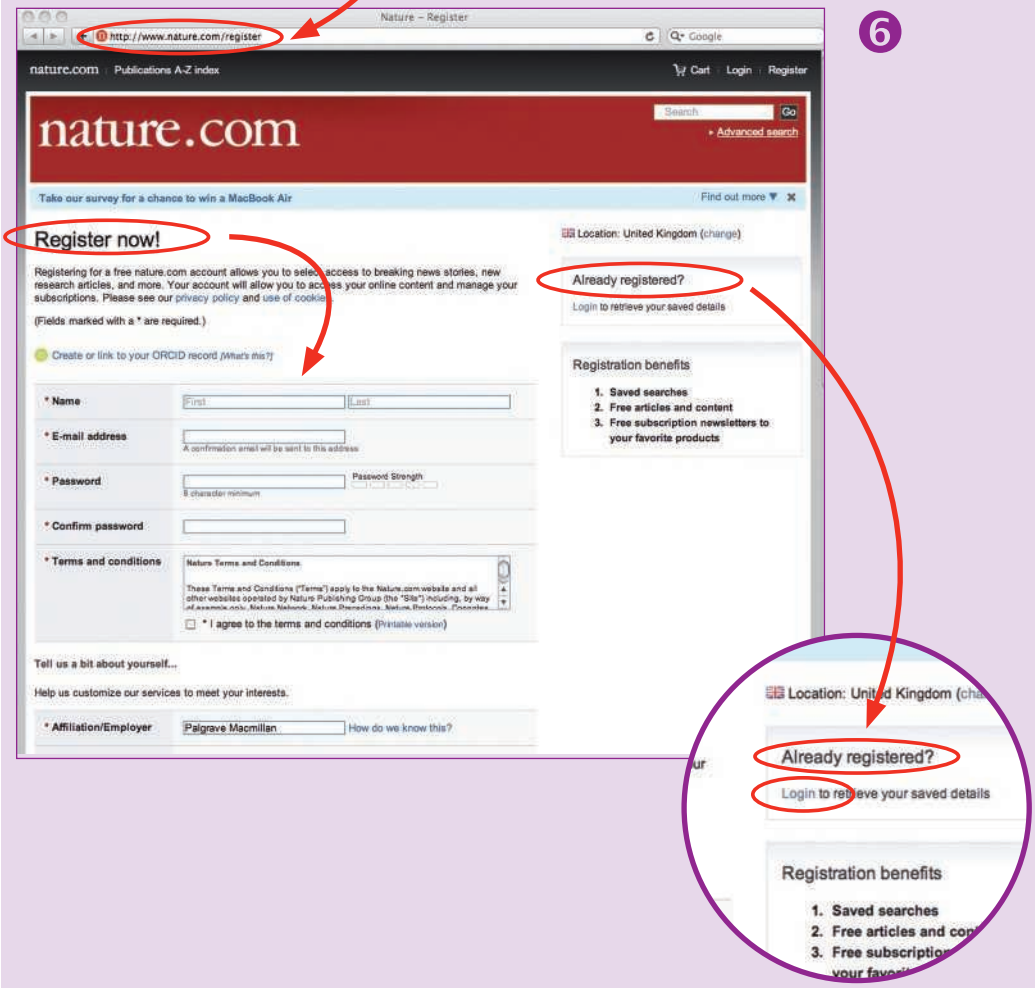
BDJ TEAM CPD INSTRUCTIONS



1. Step 1: Go to www.nature.com/bdjteamcpd
2. Step 2: Click on 'Request Free Access Now'
3. Step 3: Fill in the form
4. Step 4: When you have filled in the form, click on 'submit'

BDJ TEAM CPD INSTRUCTIONS





5 Step 5: You will receive a customer ID number by email, for example Customer ID: 2846055.

- This number indicates that you have a free subscription to *BDJ Team* CPD.
- Go to www.nature.com/register

6 Step 6: Nature is the publishing company that publishes BDJ Team.

- Follow the steps to 'Register now!'
- Have you already registered with Nature? Then click 'Login' here.

BDJ TEAM CPD INSTRUCTIONS

7. Step 7: Log-in to Nature with your email address and password

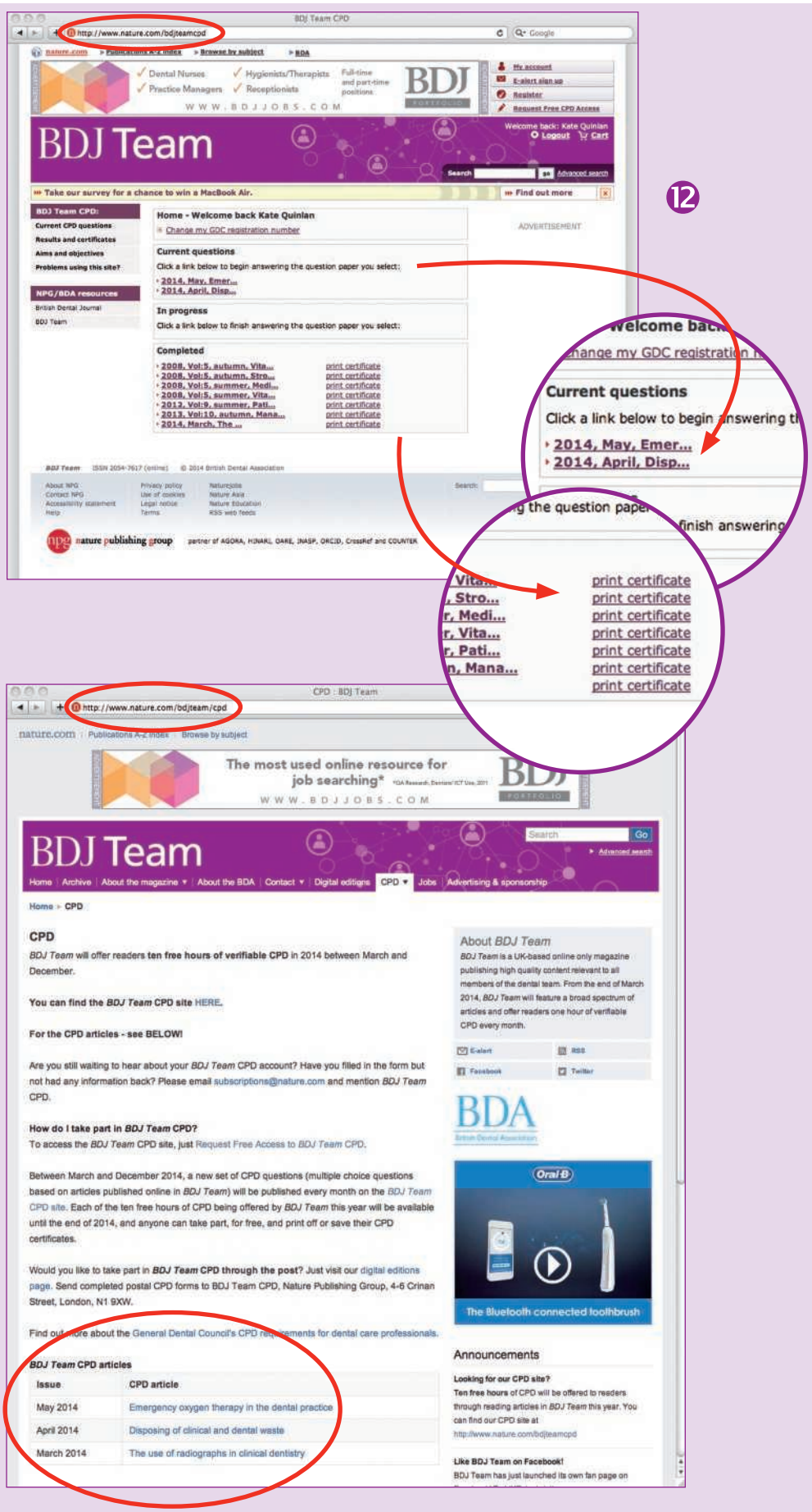
8. Step 8: When you are logged in, click on 'My account' (top right)

9. Step 9: Click on 'Subscriptions and purchases'

10. Step 10: Click on 'Want to manage a subscription not shown above?'

11. Step 11: You will see a box that says 'Customer ID'. Enter your customer ID in this box and click 'Submit'

BDJ TEAM CPD INSTRUCTIONS



⑫ Step 12: Your *BDJ Team* CPD free subscription is now set up. Go to www.nature.com/bdjteamcpd to answer the CPD questions and to save or download your CPD certificates!

FOR FUTURE REFERENCE

You can find *BDJ Team* CPD **articles** here: www.nature.com/bdjteam/cpd

You can find *BDJ Team* CPD **questions** here: www.nature.com/bdjteamcpd

bdjteam201464

BDJ Team continuing professional development

CPD: ONE HOUR

CPD questions – June 2014

CPD ARTICLE: Achieving a good bond in acrylic resin denture teeth – Pages 9-12

1. To reduce costs your laboratory takes a number of time saving steps. Which of the following can be considered good practice?

A. the technician packs a number of cases together at the end of the day

B. the technician tries to save time setting up the teeth by not removing the glaze from the ridgelap areas of the denture teeth

C. the technician uses a quick short curing cycle

D. the technician leaves the dentures overnight in the flask to let them cool slowly prior to deflasking

D. improve the bonding of the teeth by not reducing the ridgelap excessively at the risk of providing a reduced or no freeway space

3. Your laboratory routinely uses a short curing cycle and drips monomer onto the ridgelap region of the denture teeth. To obtain an optimal bond would you advise:

A. a short cure cycle and dripping monomer on ridgelap area of the denture teeth prior to processing to help improve cross linking at this important interface is good practice

B. that dripping of monomer on the ridgelap area of the denture teeth to help improve cross linking at this important interface is good practice but you advise the laboratory also to use a long cycle

C. ask the laboratory to stop dripping monomer on the teeth prior to packing

D. advise the laboratory to change to an autopolymerising resin as this is common practice in Europe

4. Several of the clinicians with whom you work have complained that a series of patients with new dentures have returned because teeth have debonded. What advice will you offer as to the possible cause of the problem?

A. the laboratory has recently changed to an injection packing system to reduce finishing time

B. the laboratory has started using a more expensive multilayer make of denture tooth

C. the laboratory has started to leave the dentures overnight after processing prior to deflasking

D. the laboratory is just going through a bad run of luck and things will improve and not to worry

2. A clinician instructs you to do the technical work for a patient who requires a replacement mandibular implant supported overdenture. There is reduced inter-maxillary space and a history of teeth debonding from the denture. What instructions would you expect from the responsible clinician?

A. use a layered tooth when the ridgelap region has to be reduced significantly

B. use a homogenous denture tooth

C. use self cured acrylic resin for the denture base

How do I take part in *BDJ Team* CPD?

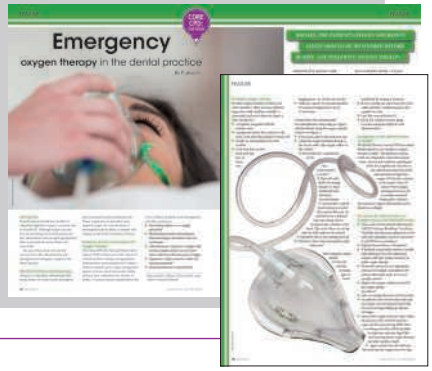
BDJ Team is offering all readers **TEN hours of free CPD** in 2014 through our website.

Just go to www.nature.com/bdjteam/cpd to take part!

Missed May's CPD?

You can complete *BDJ Team* CPD on **Emergency oxygen therapy in the dental practice** through our website, any time in 2014.

Just go to www.nature.com/bdjteam/cpd to find out how!



BDJ Team CPD – through the post

Can I take part in *BDJ Team* CPD through the post?

YES! Just print off this page, complete the form and send it with your payment of £6, to cover administrative costs. **Send to: BDJ Team CPD, Nature Publishing Group, 4-6 Crinan Street, London, N1 9XW.** We will check your answers to the CPD questions, process your payment and send you a certificate through the post.

You can participate in this *BDJ Team* CPD through the post until the end of December 2014.

BDJ TEAM POSTAL CPD FORM

1. Please PRINT your details below:

First name: _____ Last name: _____ Title: _____

Address: _____

_____ Postcode: _____

Job title: _____

GDC registration no.: _____

2. Payment details – SUBMISSIONS SENT IN WITHOUT PAYMENT WILL NOT BE PROCESSED

I enclose a cheque for £6 made payable to Nature Publishing Group for **ONE** hour of CPD ☐

I would like to pay for more than one person and enclose a cheque for £_____ made payable to Nature Publishing Group (£6 per person for an hour of verifiable CPD).

Or

Please debit the sum of £6 or £_____ from the following credit/debit card (tick box):

Visa ☐ Mastercard ☐ Switch/Maestro ☐ Visa Debit ☐

Card number: _____

Expiry date: _____ Issue no. (Switch/Maestro): _____

Name of cardholder: _____

Address of cardholder (if different to above): _____

3. I am answering the CPD questions in the _____ issue (PLEASE ENTER MONTH):

	A	B	C	D
Q1	☐	☐	☐	☐
Q2	☐	☐	☐	☐
Q3	☐	☐	☐	☐
Q4	☐	☐	☐	☐

4. Please add any comments or feedback that you might have below or email bdjteam@nature.com.

Top ten legal tips for dental practices

By Chris Davies[1]

The legalities of owning and running a dental practice can be complicated. Ensuring that your practice is compliant with UK laws is critical to running a successful business and safeguarding not only your level of patient care, but your reputation too.

When asked what would be my advice for dental practices who are keen to make sure that they are on top of all legal and HR issues and the daily management of their practices I say to remember the acronym **NO. 1 DENTIST**.

This acronym should help you to remember the most important tips for ensuring your practice is covered legally in a range of aspects.

'WRITING "PIN" ["PAIN IN THE NECK"] COULD BE READ BY THE PATIENT AND COULD LEAD TO ERASURE!'

N for Necessary Experience

Try to ensure that your advisors, such as your accountant and lawyer, have the necessary experience and credentials to be able to fully advise you on a range of potential issues. In such a complicated industry, it really does pay to have experts on hand as it will inevitably save you money and hassle in the long run.

O for Obtain Licence

It can be a temptation not to pay as much consideration to the non-dental parts of the business but for instance if you play music in your dental surgery, you may need to obtain a licence to do this otherwise it could be a breach of copyright. My top tip would be to always check!

1 for Section 1

Under Section 1 of the Employment Rights Act 1996, as an employer you are obliged to provide your employees whose employment is to continue for more than one month with a written statement of certain terms of their employment. This written statement or contract, containing the required statutory particulars, is often referred to as the section 1 statement.

D for Data

If not already registered, check whether your business should be registered with the Information Commissioner's Office – the Data Protection Act requires certain businesses to register. If in doubt check - ironing this out early on will save headaches later on.

E for Employees

Your employees are your most important assets and it's imperative to ensure they are fully trained for the job they are doing. Ensure qualifications and training standards are kept up to date. Employees who feel invested in will always do better than those that feel like a commodity to your business.

N for Naming

Ensure that all of your contracts (including the NHS contract) are in the name of the correct trading body of the practice. Failure to do so could result in difficulties when you come to sell your business and could potentially cause accounting and tax problems.

T for Trademark

Before spending too much time and effort on branding or re-branding your business, make sure there is not already a registered trade mark out there that will prevent you from using your desired branding. It might also be worth considering registering a trademark yourself. When doing this, consult legal professionals early on, and again the process will be far more straightforward and cost effective than you may expect.

I for Include Provisions

Include confidentiality provisions in employment contracts. Should the worst happen and an employee 'steals' your business' confidential information, it will be a lot easier to take the relevant action with a confidentiality provision in the employment contract than without one.

S for Software

Ensure all your computer software is properly licensed and that you are not over-deploying your software licences by using the software on more computers than the licence permits.

T for Timing

When buying or incorporating a practice, make sure that you deal fully with the requirements of the CQC, NHS England/Wales and the bank. Make sure that each application is finalised in a timely manner so that you do not experience delays on completion.

The BDA is running a Law, ethics and record keeping course on 4 July 2014 at the BDA, 64 Wimpole Street, London, W1G 8YS. Please visit ***www.bda.org/training*** *or call 020 7563 4590 to book.*

bdjteam201465

[1] *Partner and head of the dental practice legal team at law firm JCP Solicitors. www.jcp-healthcare.co.uk*