and researchers, or even conducting studies. For example, a researcher can sit in their office and interview a participant at their home, using augmented reality (eg hologram) with a 4D experience. Another example is when assessing healthcare services, different scenarios could be created virtually and participants can be immersed in this virtual environment using VR goggles. The potential advantages include reducing the costs of running a study; ensuring the consistency of interventions for different participants; and minimising the risks that may be associated with different interventions in real world. Potential disadvantages may include: the cost of setting up the virtual environment and resources; the need for training of participants and researchers; and generalisability of the results to the real world.

It seems that a blended approach that combines reality and virtual environments can be employed in different aspects of healthcare research. Besides its challenges, it could also enable us to implement studies which may have not been ethically possible in the real world.

M. Dorri, by email

1. Milgram, P, Takemura, H, Utsumi, A, Kishino, F. Augmented reality: a class of displays on the reality-virtuality continuum. *Telemanipulator and Telepresence Technologies* 1994; **2351:** 282–292.
2. Fox6News. Pokemon Go breaks Apple download records, overloads servers. 23 July 2016. Available at: http://fox6now.com/2016/07/23/pokemon-go-breaks-apple-download-records-overloads-servers/ (accessed 5 December 2016).
3 Levono Health. Practical applications for virtual reality in healthcare. Available at: http://lenovohealth.com/practical-applications-virtual-reality-healthcare/ (accessed 5 December 2016).

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Patient safety

Cardiac devices

Sir, following a review of the literature and previous correspondence of Balfrey,[1] Firth[2] and Alexander,[3] it seems clear that there is still confusion within the general dental community of the management of patients with implantable cardiac devices/pacemakers. A 2012 narrative review[4] attempted to provide guidance on the matter. The article references that some common ultrasonic scalers and ultrasonic baths do produce electromagnetic interference and may pose a risk to patients. This is supported by the British National Formulary (BNF)[5] recommending that 'some ultrasonic scalers, electronic apex locators, electro-analgesic devices, and electrocautery devices interfere with the normal function of pacemakers (including shielded pacemakers) and should not be used.' However in opposition, a review conducted by Trenter and Walmsley[6] states that piezoelectric ultrasonic scalers are safe for use in patients with pacemakers.

Due to conflicting evidence on this topic it is the view of the authors that a review of the literature with cardiology specialist input is much needed in order to provide some clarity on the safe management of such patients.

D. Raindi, Sutton Coldfield
J. S. Chandan, Birmingham

1. Balfry G. Pacemakers and ultrasonic scalers. *Br Dent J* 2005; **199,** 625–625.
2. Firth R. Practising with pacemakers. *Br Dent J* 2006; **200:** 124.
3. Alexander M. Scalers: review advice. *Br Dent J* 2006; **200:** 183.
4. Conteh D D. Patients with pacemakers. *Vital* 2012; **9:** 22–23.
5. Joint Formulary Committee. Pacemakers : British National Formulary. British National Formulary (online) London: BMJ Group and Pharmaceutical Press. Available at: https://www.evidence.nhs.uk/formulary/bnf/current/guidance-on-prescribing/prescribing-in-dental-practice/medical-problems-in-dental-practice/pacemakers (accessed 1 December 2016).
6. Trenter S C, Walmsley A D. Ultrasonic dental scaler: associated hazards. *J Clin Periodontol* 2003; **30:** 95–101.

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Anticoagulants

Lack of research

Sir, I work in the oral surgery department of a London Hospital and regularly treat patients with significant co-morbidities many of which take an anticoagulant medication, primarily warfarin. Within the last year I have come across an increasing number of patients taking the newer range of novel oral anti-coagulants (NOACs), which do not require routine blood test monitoring.[1] I am, however, concerned at the lack of research (no clinical trials) and experience using these medicines along with dental extractions.

A recent case of a 78-year old-lady who had started taking dabigatran for atrial fibrillation approximately three months earlier, having previously taken warfarin for a number of years, highlighted this for me. She suffered considerable post-operative bleeding and bruising over a two-week period following extraction of the upper left wisdom tooth, which was completed under local anaesthetic via an atraumatic forceps technique with Surgicel and 3-0 Vicryl absorbable sutures placed as precautionary local haemostatic measures.

Despite being introduced in 2008 the NOACs are only just starting to be used more frequently for conditions such as atrial fibrillation and prevention of stroke as an alternative to aspirin. Recommendation from the Scottish Dental Clinical Effectiveness Programme states that if patients are undergoing a low bleeding risk procedure no interruption in their medication should occur; an atraumatic extraction is considered to be low risk. For higher risk procedures, the medication should be missed on the day of their procedure; however, the evidence supporting these suggestions is of low quality.[2]

The case above was very distressing for the patient and her family; as a result I have concerns as to how dental procedures can be safely carried out on this new population. The decision to stop a medication can be of concern to both the dentist and patient if not fully considered with their physician.

F. McDonnell, by email

1. National Institute for Health and Care Excellence. Novel oral anticoagulants an option for patients with atrial fibrillation. June 2014.
2. Scottish Dental Clinical Effectiveness Programme. Management of dental patients taking anticoagulants or antiplatelet drugs. August 2015.

DOI: 10.1038/sj.bdj.2017.147

Advertising

Longstanding dislike

Sir, as an admirer of Damien Walmsley, I have found that my longstanding dislike of the *BDJ*'s practice of sticking advertising material to the front cover has been heightened since his series of images started to appear (Volume 221, 2016). Tell me please, what is the point of giving any thought to the design of the cover when it is covered every time?

R. Bettles, by email

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Antimicrobial resistance

Setting the record straight

Sir, we are delighted one reader thought the new antimicrobial prescribing toolkit was 'excellent' (*The toolkit blah*, *BDJ* 2017; **222:** 141). However, there did seem to be a few misconceptions, and I wanted to set the record straight.

Working in the NHS and facing the same decisions week in, week out I well understand the writer's frustrations. We do not set out to place any new obligations on this profession. Nor do we seek to fudge any of the issues around the UDA, and the constraints it has placed on our members' time.