COMMENT

Letters to the editor

Send your letters to the Editor, *British Dental Journal*, 64 Wimpole Street, London, W1G 8YS. Email bdj@bda.org.
Priority will be given to letters less than 500 words long. Authors must sign the letter, which may be edited for reasons of space.

The future of dentistry

Dental education in the metaverse

Sir, the use of artificial intelligence (AI) is now a reality in dentistry. A significant advancement is the use of haptic gloves that would let dental students feel virtual objects while practising suturing or giving a nerve block – this can significantly improve the students' technique over time and give them, for example, immediate feedback with respect to needle point insertion.[1,2] While initial costs for such systems might seem high now, the hardware is proven to be cost-effective in the long term.

The metaverse is an extension of the internet that allows users to interact with each other and the environment around them. This is achieved using various types of technologies including virtual reality (VR) and augmented reality (AR). These scenarios may seem far from our daily teaching activity or segregated to research labs only. While virtual education spaces such as Zoom, Teams and Google Meet are the new norm, the creation of digital laboratories is also a reality: real online players are challenged to solve difficult scientific problems.[3,4]

A PubMed search in January 2022 with the keyword 'metaverse' showed only 12 articles and none referenced dentistry. Currently, some medical schools have been trying out VR goggle setups or using anatomical models controlled via tablet; however, both have significant limitations compared to working directly within VR using haptic technology. Presence (the student's sense of being there) has always been considered necessary for successful learning and for appropriate patient care. In light of the last two years of forced social distancing, should we perhaps upgrade the 'old' telemedicine to a more immersive experience?

L. L. Locurcio, London, UK

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Dentistry in the metaverse

Sir, it is predicted that within two to three years, most virtual meetings will move from 2D camera image grids to the metaverse, a 3D space with digital avatars. The metaverse is a virtual world wherein people will be virtually represented through avatars in their online interactions.[1] The health industry has now started using components like augmented reality (AR), virtual reality (VR) and artificial intelligence (AI). The Johns Hopkins neurosurgeons have performed the institution's first AR surgeries in living patients this year. This consisted of a headset with a see-through eye display that projects images of the patient's internal anatomy such as bones and other tissue based on CT scans – essentially giving the surgeons an x-ray vision.[2]

Dentistry too will evolve in the near future, taking a cue from medical health practices in their exploration of the metaverse. Soon, we might have dental telehealth conversations in a virtual metaverse with our avatars indulging in dental health consultation with patients. Imagine doing a root canal with x-ray or 3D images of canal morphology in your live view, placing an implant, seeing the exact position of implant and bone at the time of surgery, or removing a tumour growth with a live feed of anatomical tumour extension in your vision.

With more accessibility, no travel cost and the benefit of moving from different sessions or booths being possible from anywhere in the world, there are endless possibilities – from dental health access for underprivileged people to using technological innovations to upgrade training models.[3] Although technology is marching relentlessly forward, some things remain fundamental, and people-to-people communication will continue to be one of them.

N. Kurian, J. M. Cherian, K. G. Varghese, Ludhiana, India

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Pharmaceuticals

A bruising suggestion

Sir, the recent letter by Z. Mehmood *et al.* entitled 'Bruising' raises the important issue of dental practitioners being aware of adverse drug interactions.[1]

The authors pointed out such a case of miconazole and warfarin interaction to this effect.[1]

While it is imperative to be aware of adverse drug interactions, it is perhaps equally important to be aware of what to prescribe alternatively.

While systemic azole therapy along with miconazole in an oral gel form have been documented to entail a significant rise in the international normalised ratio (INR) in warfarin users, there is evidence in the literature to support the use of nystatin as an oral solution.[2,3]