

ENT from afar: opportunities for remote patient assessment, clinical management, teaching and learning

Abstract

Remote communication in ENT has been expanding, spurred by the COVID-19 pandemic. Conferences and teaching have moved online, enabling easier participation, and reducing financial and environmental costs. Online multi-disciplinary meetings have recently been instigated in Africa to discuss management of cases in head and neck cancer, or cochlear implantation, expanding access and enhancing patient care. Remote patient consultation has also seen an explosion, but existing literature suggests some caution, particularly because many patients in ENT need an examination to enable definitive diagnosis. Ongoing experience and more research is needed to better understand how remote communication will fit into our future working lives, both during and after the pandemic.

Key points

- Remote communication is increasingly being used in the workplace, as a result of the COVID-19 pandemic
- Most teaching and conferences have moved online, and are now seeing record numbers of attendees
- Recently instigated online multi-disciplinary meetings increase availability of services, can enhance standards of care, and offer platforms for learning
- Remote patient consultation has seen an explosion, but may not be appropriate for many ENT patients because they often need to be examined
- Future experience and research will better define how to best integrate remote communication into our working lives

The 14th Century Arab scholar Ibn Khaldun (considered by many to be the founding father of sociology) was the first to analyse the fundamental role of social cohesion to human existence. He drew on examples from the Berber and the Banu Hilal desert tribes of Arabia, and documented how such groups formed around shared values and ideology. In contemporary times we still include family and friends amongst our “tribes,” but now often also foster tribes formed of other social or functional groups - including our work colleagues, or local and international colleagues in ENT. Social distancing during the COVID-19 pandemic has forced us to link with these tribes through the internet, and made us realise potential (and previously under-recognised) advantages to remote communication, at least in our working lives.

Virtual meetings, teaching and conferences

Like many, we have increasingly used internet platforms to conduct meetings, deliver teaching, or participate in conferences. For example, in November 2020 the *Royal College of Surgeons of England* conference on *Future Surgery* had over 3500 registrants from over 80 countries, and in January 2021 the first virtual *British Academic Conference in Otolaryngology* over 1250 registrants from over 50 countries. Educational content delivered virtually carries several advantages: it facilitates inclusion of international speakers and delegates, may enable content to be watched asynchronously at a convenient time, and reduces time and financial costs. Perhaps it should not be surprising that many established conferences have moved online and now report record numbers of attendees. Give the pressing dangers of climate change we also should not forget the positive impacts to planetary health. The *American Thoracic Society* estimated that in 2019 the average delegate attending their annual conference generated 577 kg of carbon dioxide in aviation emissions, a quarter of the ceiling of 2300kg emissions per person we should be aiming for in an entire year(1).

In terms of teaching, we have also seen a huge expansion on the web. The *Association of Otolaryngologists in Training* website has (to date) collated over 100 teaching webinars from several sources: national ENT training days, the *British Association of Paediatric Otolaryngologists*, the *British Rhinological Society*, Guys & St Thomas’s hospitals (London), Barts Hospital (London) and the platform *ENT Grand Rounds*. In other examples, in October 2020 the London School of Hygiene and Tropical Medicine (in partnership with the University of Nairobi) ran the 46th course on *Public Health Planning for Hearing Impairment* for the first time on a virtual platform, and in January 2021 the *Virtual Reality in Medicine and Surgery* training platform enabled over 500 delegates to immerse themselves in live and pre-recorded simulated surgery in cadavers using headsets connected to personal smartphones.

This enthusiasm and opportunity should be balanced with some caveats. Reliable internet is not available in all countries or regions worldwide, and data can be expensive in many low- and middle-income countries, limiting universal and easy access to such educational resources. Acquisition of manual skills such as those required for surgery may be better practiced in-person rather than virtually. And of course, we should not underestimate the

social aspects of in-person courses and conferences, which often adds value that cannot be fully captured through online interaction.

Virtual case discussion

For several years, and across diverse contexts, telecommunications have also been exploited to discuss and support clinical care. That might include use of the *WhatsApp* platform by community health workers in Uganda to share cases of ear disease in their local village,(2) or the same platform used by geographically dispersed non-specialist surgeons in the Pacific islands to discuss management of ENT pathology. The internet can also be exploited to assist diagnosis: for instance, half of African head and neck surgeons reported that poorly developed histopathology services were an obstacle to providing care,(3) but now that histology slides can be transmitted online for diagnosis by experts in a remote location,(4) such barriers could be overcome.

This has been taken further, with an entire multi-disciplinary team (MDT) available online. For example, comprehensive head and neck cancer management may require oncological surgeons, reconstructive surgeons, oncologists, speech pathologists, psychologists, histopathologists, radiologists, anaesthetists, and nutritionists. Many centres in lower resourced regions do not have available the full range of such expertise. Last year the African Head and Neck Society (AfHNS) instituted a monthly virtual MDT for discussion of complex clinical cases, which is attended by up to 150 such specialists and trainees from across Africa, the Middle East, South Asia, Europe, and USA. Similarly, many centres wishing to establish and provide cochlear implant services may not have the required expertise in audiology, speech pathology, radiology, or otolaryngology, and last year an African Cochlear Implant MDT was established by the University of Cape Town to include international experts facilitating discussion on candidacy or other clinical issues. These inter-institutional and international MDTs support clinical and academic collaboration, enhance availability of services, help deliver high standards of patient care, and provide opportunities for teaching.

Remote patient assessment

Of course, during the pandemic many of us have also seen an explosion in the use of remote consultation for patient care. And there are potential huge advantages to patients in terms of costs to their time, purse, and carbon footprint. But it's been a mixed bag. The British wartime Prime Minister Winston Churchill stated that "True genius resides in the capacity for evaluation of uncertain, hazardous, and conflicting information." With remote consultation often the question is how little information we as clinicians feel comfortable with to make a decision. Guidance from NHS England suggests remote consultation is most suitable for people who do not need a physical examination,(5) which conflicts with the reality that many patients in ENT having a first consultation do need to be examined. Is that discharging ear from otitis externa, a tympanic perforation, or a cholesteatoma? Is that blocked nose due to allergic rhinitis, septal deviation, or nasal polyposis? Is the dysphonia because of vocal cord nodules, Reinke's oedema, or a squamous cell carcinoma?

In this issue, Gupta et al report a systematic review of remote consultation in ENT(6) where they found that up to 72% of patients required a follow-up appointment. We really need to better investigate and define where remote consultation is appropriate and effective, such that it provides definitive care rather than kicking the can down the road. Key to that success will be our ability to capture and send more high-quality information to the person making the diagnosis.

That opportunity has already been explored and developed, particularly for disorders of the ear and hearing, and applied in regions like sub-Saharan Africa where there are very few ENT surgeons or audiologists, and task shifting to community health workers supported by mHealth technologies has proven to improve access and affordability. Remote diagnosis of ear disease from captured images or video has been validated in a number of studies,(7)(8)(9) but nevertheless human resource scarcity remains a barrier because specialists' time is still required to interpret the data transmitted. In an attempt to circumnavigate that problem, in this issue Schuster-Bruce et al report a study exploring performance of non-specialist diagnosis or of a prediction model based on patient history, compared to expert onsite or tele-diagnosis.(10) Models not utilising an expert were found to be inaccurate, and so we do need to further improve data capture and analysis. Recent advances in artificial intelligence (AI) diagnosis of images of the tympanic membrane are showing promise,(11)(12) with the first clinically available AI classification system released last year as a beta version.(13) Pure tone audiometry conducted from a mobile phone using automated protocols and calibrated headphones has also demonstrated accurate results, and in combination these technologies are paving the way for decentralised ear and hearing care through simple user-interfaces that enable digital inclusion, and incorporate quality control and remote support.(14)

But again, although promising, we must remember these technological developments come with caveats. Patients and community members from the most remote or socio-economically disadvantaged circumstances may not have easy access to technological platforms(15), and so we need to be cognisant that we keep use of remote consultation equitable. And we will all be aware of the difficulties our patients with hearing loss may have with communication that is not face-to-face, or indeed our laryngectomees.

Doing things remotely has been forced upon us, and found to have many advantages but also disadvantages. Going forward, we need to exploit our growing experience, and relevant research, to understand how this is best integrated into our working lives both during the pandemic and beyond.

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