



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

# Following COVID-19 clinicians now overwhelmingly accept virtual clinics in Oral and Maxillofacial Surgery

T. Al-Izzi\*, J. Breeze, R. Elledge

Queen Elizabeth Hospital Birmingham, B15 2TH, UK

Available online 3 August 2020

## Abstract

Virtual consultations and telemedicine have been an emerging trend in modern medicine, which has seen acceleration in uptake across a wide range of specialties as a result of the COVID-19 pandemic. Following on from previous work by the authors in 2019 examining clinician and patient appetite for virtual consultations in maxillofacial surgery, we sought to evaluate whether there had been a change in attitudes as a result of the pandemic. A clinician survey of the consultants at a large teaching hospital and prospective data collection of virtual consultation outcomes was carried out from the inception of UK government lockdown measures to tackle the pandemic. From 151 consultations, 149 (98.7%) successfully established a working diagnosis and treatment plan and/or concluded an episode of patient care, without the need to convert to a face-to-face encounter between clinician and patient. The total number of consultations (virtual or otherwise) was significantly lower than the same time period the preceding year however (1,223 compared with 465 consultations). All consultants surveyed felt the pandemic had altered their opinion of virtual clinics and their place in maxillofacial surgery but cited a number of issues. Further work is required to understand the driving forces behind staff attitudes and the long-term adoption of telemedicine within the specialty as services return to some sense of normalcy.

Crown Copyright © 2020 Published by Elsevier Ltd on behalf of The British Association of Oral and Maxillofacial Surgeons. All rights reserved.

**Keywords:** virtual clinic; Oral Maxillofacial Surgery; virtual consulting; teleconference; COVID-19

## Introduction

Virtual consultation clinics are a growing part of our national healthcare service (NHS) with the potential to alleviate pressures in clinic availability and reduce costs. With the advent of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and the COVID-19 pandemic, an addition benefit of virtual consultations has been reinforced: the ability to continue healthcare services where health-related circumstances preclude face-to-face consultations. This has accelerated an already existent trend towards telemedicine in some specialties and introduced it as a concept in others, where the idea was yet to take root. Whilst oral and max-

illofacial surgery could be categorised in the latter group, a clear interest is emerging in collaborative virtual planning, an enhanced role for surgical simulation, virtual multi-disciplinary team (MDT) meetings and virtual consultations, as well as telemedicine for triaging referrals.<sup>1</sup>

The authors previously carried out a prospective survey among clinicians and patients in a large teaching hospital to assess attitudes towards virtual clinics.<sup>2</sup> This was carried out in late 2019, just before the emergence of the COVID-19 pandemic in the United Kingdom in early 2020. Whilst perception of the concept amongst clinicians and patients were largely positive, clinicians in particular raised concerns about applicability within the specialty and the possibility of missing diagnoses as a result of not being able to physically examine patients. We sought to evaluate whether there had been a significant shift in attitudes as a result of the pandemic.

\* Corresponding author at: 75 Arosa Drive, B17 OSD.  
E-mail address: [taha.al-izzil@nhs.net](mailto:taha.al-izzil@nhs.net) (T. Al-Izzi).

## Material and methods

Data was prospectively collected from virtual clinic patient notes at the hub unit of a large teaching hospital between 23rd March and 24th April 2020, in a similar time frame to our previous paper.<sup>2</sup> A data collection sheet was designed which included patient demographics, subspecialty, consultation type and outcome of consultation. Favourable outcome was defined as a virtual consultation concluded without the need to convert to a further face-to-face review to establish a working diagnosis and treatment plan and/or conclude the episode of care to the satisfaction of the clinician, and with no further concerns raised by the patient.

The clinician survey assessed opinion of virtual consultations, suggestions for improvement and willingness to continue using virtual consultations assuming the hypothetical situation that a return to pre-COVID-19 clinical practice was possible. The clinician survey was carried out using the online survey tool SurveyMonkey<sup>®</sup> and restricted to the Consultant body.

Analysis was carried out using Minitab<sup>®</sup> 2017 and Microsoft<sup>®</sup> Excel<sup>®</sup> 2010. Formal ethics approval was not required as our survey was restricted to staff members and a prospective audit of the patient records, but the project was registered with the Trust Clinical Audit and Registries Management Service (CARMS) 15146 and given approval by the Clinical Governance and Staff Experience teams.

## Results

In total, 151 virtual clinic consultations were conducted between March and May 2020. This represented 32.4% (151/315) of all consultations undertaken in this time frame. Of the virtual clinic cases, 84 (55.6%) were male and 67 (44.4%) were female. The age range for the whole cohort was between 17 and 90 with a mean (SD) age of 52.5 (20.3) years. Favourable outcome was defined as a virtual consultation concluded without the need to convert to a further face-to-face review to establish a working diagnosis and treatment plan and/or conclude the episode of care to the satisfaction of the clinician, and with no further concerns raised by the patient. Over the entire cohort only two virtual consultations had to be converted to a face-to-face consultation, equating to a favourable outcome of 149/151 (98.7%).

A bar graph of virtual clinic breakdown by subspecialty and outcome is shown in Fig. 1.

The clinician survey was disseminated via SurveyMonkey<sup>®</sup> in May 2020, out of the 13 surveys that were sent 9 were completed by the consultants. The questions included in the survey are shown in Table 1. Most notably, all clinicians surveyed felt that the pandemic had altered their opinion of virtual clinics and that virtual clinics should persist as a permanent fixture following resolution of normal clinical activity. Comments on this area highlighted the convenience of virtual consulting but also the need to

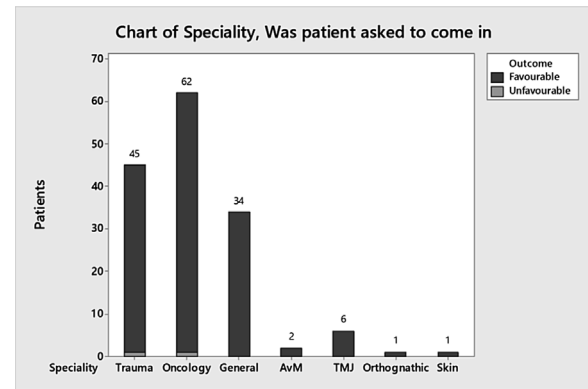


Fig. 1. Bar chart showing total virtual clinic appointments by subspecialty: trauma, oncology, general, arteriovenous (AvM), temporomandibular joint (TMJ), orthognathic and skin clinics. Oncology had the highest overall number of virtual clinic appointments with 62/151 (41%) followed by trauma with 45/151 (29.8%) and general with 34/151 (22.5%). The remaining 10 patients (6.7%) were spread over TMJ, AvM, orthognathic and skin clinics. Of the two appointments converted to face-to-face consultations to achieve a resolution for the clinical episode of care, one was a trauma case and the other an oncology case.

improve the service by use of guidelines for triage. One respondent felt that the preparation required meant that virtual consulting was more taxing.

Some issues were noted with the system in the comments, in particular that patients often failed to answer the phone at agreed appointment time, issues with language barriers and an identified need for the system to be more “streamlined”. The total clinical workload in the department during this initial period of the COVID-19 pandemic is shown against the clinic footfall during the same period in the preceding year in Fig. 2. Line graphs in Figs. 3 and 4 demonstrate numbers of face-to-face consultations and virtual consultations by subspecialty as the weeks progressed from the COVID-19 UK government lockdown starting point of 23rd March 2020.

Figs. 3 and 4 below show respectively the number of face-to-face and virtual consultations conducted over the trial period by subspecialty. Fig. 3 shows an overall week-to-week decrease in the number of consultations with fluctuations evident. In the case of trauma, activity appears to begin to pick up between weeks 4 and 5 although it is unclear whether this is another fluctuation as week 5 ends of the timeline. Fig. 4 demonstrates more stability week-to-week with a slight downwards trend in the oncology subspecialty to week 3 and a slight lift in cases through weeks 4 and 5.

## Discussion

Despite our previous analysis of clinician and patient perception of virtual clinics being published only months before, the potential impacts of a global pandemic could not have been anticipated in terms of accelerating the reliance on telemedicine. Early guidance from groups such as the British Association of Oral and Maxillofacial Surgeons (BAOMS)

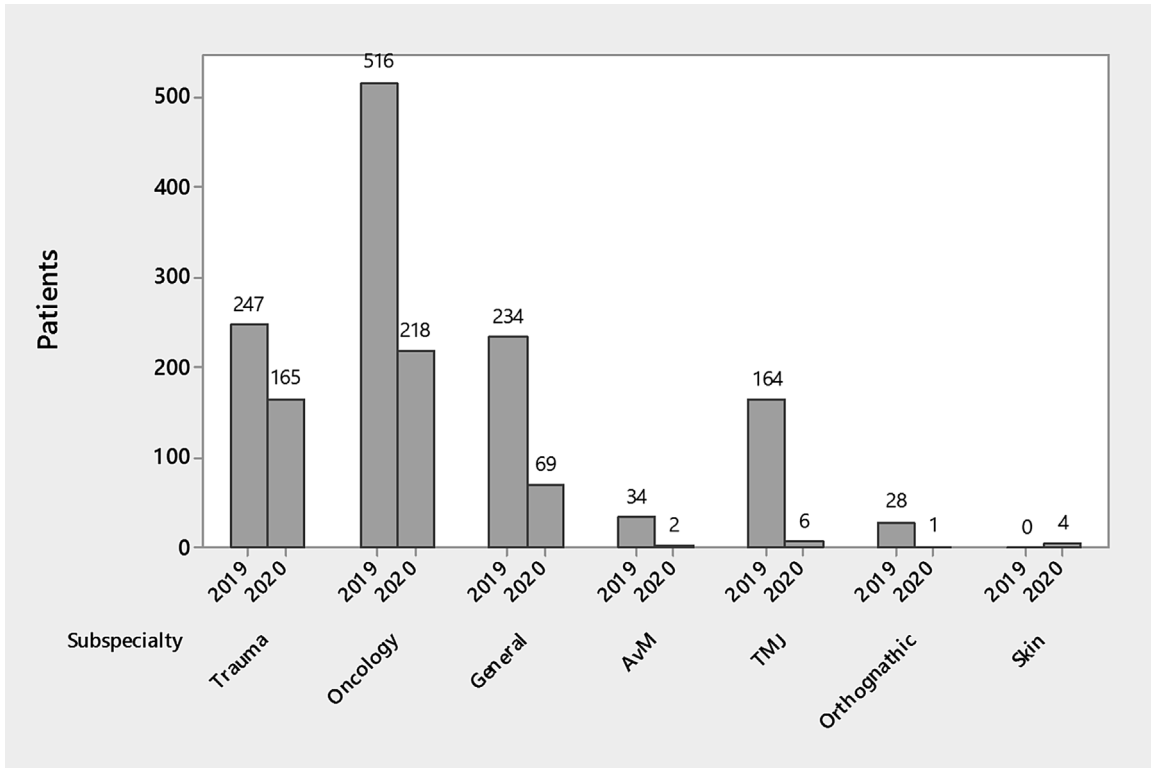


Fig. 2. Bar chart showing patients attending subspecialty outpatient clinics over the same time period (March – May) in 2019 and 2020. All appointments in 2019 (n = 1,223) were conventional face-to-face appointments compared to mixed virtual and face-to-face consultations held in 2020 (n = 465).

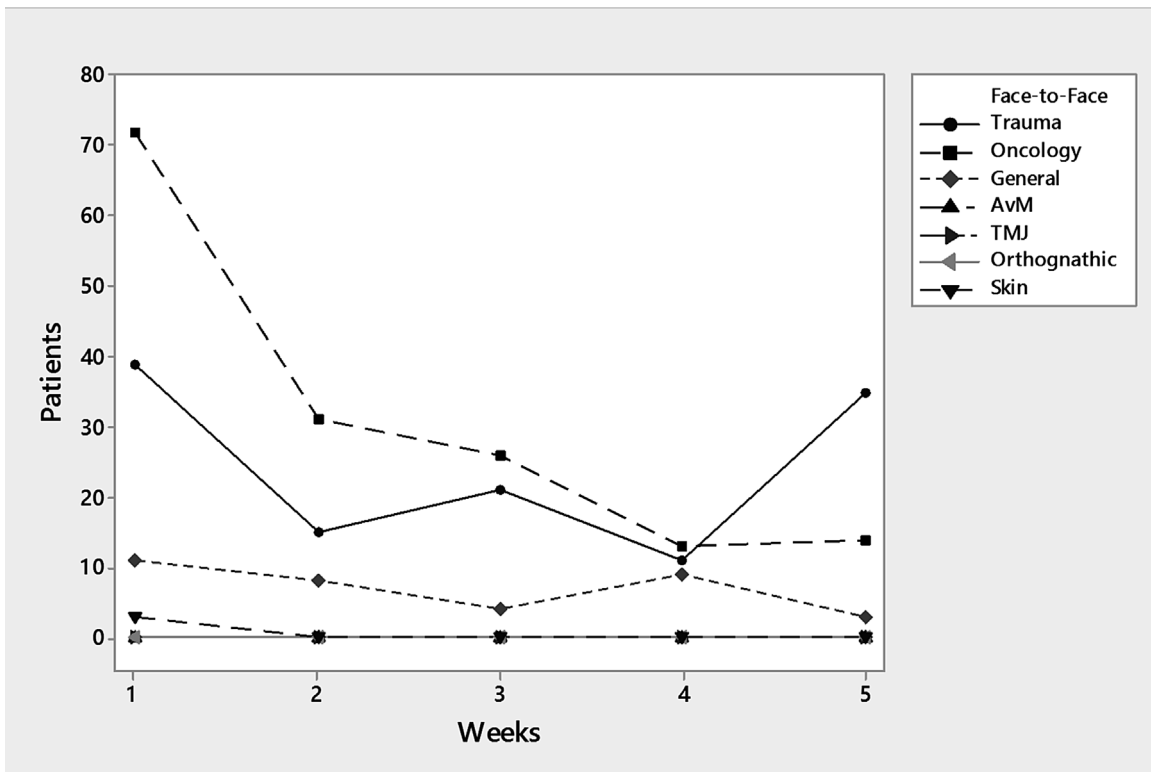


Fig. 3. Total number of face-to-face consultations tracked from the beginning of the UK government lockdown on 23rd March 2020 until 24th April 2020 by subspecialty. In total 315 consultations were carried out face-to-face over this period.

Table 1  
Questions included in the clinician survey distributed with SurveyMonkey®.

Question		Respondents	Question response rate
		Total: 9	
1. Has your opinion on the applicability of virtual clinics for Maxillofacial Surgery changed in the wake of the COVID-19 pandemic?	Yes	9	9/9
	No	0	
2. In what way?	Comments	9	9/9
3. What methods of virtual consultations have you used in the COVID-19 pandemic?	Telephone	4	4/9
	Virtual	0	
4. Had you used any of these methods pre COVID-19?	Yes	0	9/9
	No	9	
5. Do you think that you would continue to incorporate virtual clinic technology in your clinical practice post-COVID-19, assuming face to face consultations could return to pre-COVID-19 levels?	Yes	9	9/9
	No	0	
7. Do you see this being a standalone virtual clinic or as slots within an existing clinic?	Standalone	4	9/9
	Existing	5	
8. What issues with virtual clinics have you encountered?	Comments	9	9/9
9. What positive attributes or advantages have you experienced with virtual clinics during the COVID-19 pandemic (if any)?	Comments	7	7/9

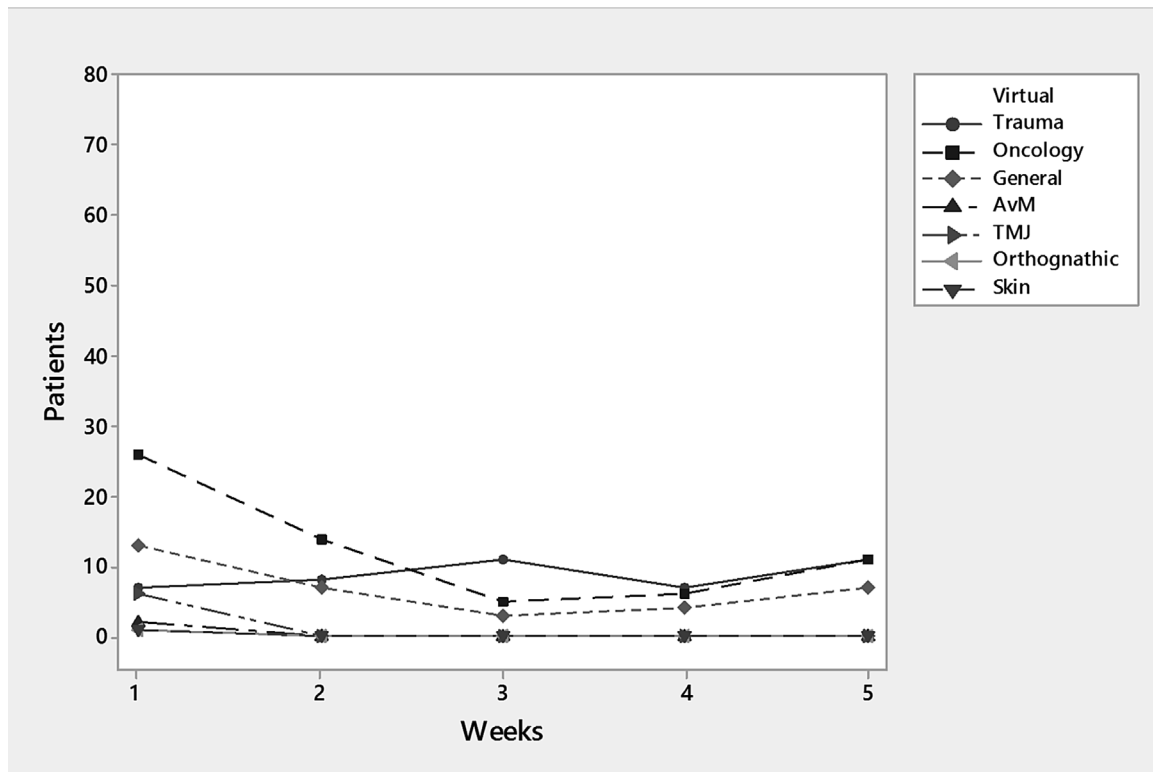


Fig. 4. Total number of virtual consultations tracked from the beginning of the UK government lockdown on 23rd March 2020 until 24th April 2020 by subspecialty. In total 151 consultations were carried out virtually over this period.

and ENT UK supported the use of telephone and video consultation triage as part of a “PARA” approach (PPE, Avoid, Restrict, Abbreviate).<sup>3</sup>

Virtual clinics are still a very new method of consultation in our specialty, but the concept has already gained increasing acceptability in specialties as diverse as urology,<sup>4</sup> otolaryngology,<sup>5</sup> orthopaedics,<sup>6</sup> dermatology,<sup>7,8</sup> neurosurgery<sup>9</sup> and psychiatry<sup>10</sup> among others. Primary care in particular already demonstrated a conversion of telehealth from under 5% of visits to almost 93% of visits whilst simul-

taneously maintaining high levels of patient satisfaction in one study.<sup>11</sup>

The need to recourse to face-to-face consultations and abandon the virtual consultation appeared to be very low indeed in the present work. These results may be tempered by the reality that patients are willing to tolerate service issues (which may not be the case post lockdown) and clinicians may have been reticent to recall patients due to the present situation, weighing up risks and benefits differently to the pre-COVID-19 era. Indeed this is supported by the

observation that whilst face-to-face consultations fell, virtual clinic consultation remained relatively static from the starting point of 23rd March 2020, as clinical activity as a whole in the department fell quiet when compared with a similar time period in the preceding year. Clearly further work is required to clarify these uncertainties; however the low failure rate of virtual consultations in our study would seem to echo the findings by a recent collaborative data collection project published by Blackhall et al<sup>12</sup> that demonstrated 97% of virtual consultations being deemed as fit for purpose by clinicians. The conversion rate in their study was also low, with 14.2% of patient interactions done virtually requiring a face-to-face consultation to conclude the episode of care or reach a definitive decision.

In our last report, clinician opinion was split with only 7/13 senior clinicians surveyed happy to trial virtual clinics.<sup>1</sup> This follow up survey was disseminated to the same cohort of senior clinicians and resulted in 9 responses. All clinicians surveyed felt there was a place for virtual clinics long term after lockdown. From our small clinician sample there appears to be positive opinion on virtual consultations. During the COVID-19 pandemic, particularly in the early phases, care was delivered by senior staff in the interests of expediency and accuracy.

Clinicians raised some logistical issues with call scheduling, patients not answering and system faults. The unprecedented impact of COVID-19 meant unplanned roll out of virtual clinics on a large scale. Circumstances may have meant clinicians were forced to appreciate a medium they were previously unfamiliar with, but it is also likely that planned implementation of a virtual clinic system would operate more smoothly. We chose not to follow-up the patient survey from our previous study as patients were largely amenable to trialling the system in our previous study, and we were able to quantify favourable outcomes of virtual consultations in this follow-up. In addition, research at our Trust was geared towards clinical research in COVID-19 for NIHR portfolio adopted studies through the COVID-19 Research Facilitation Group (RFG). As such, for the sake of simplicity we felt it would be prudent to restrict responses to clinicians. Our other consideration was generating responses from patients at a time when footfall and time spent in hospital was minimised in line with PARA guidance from BAOMS.

For virtual clinics to persist after SARS-CoV-2 lockdown there is a need for guidance. Certain situations that may have previously been deemed as inappropriate for virtual clinics (e.g. breaking bad news) may actually now be considered.<sup>13</sup> Although a virtual consultation format is not suitable in all cases the present situation has shown that it can be used more broadly than previously thought. Lack of awareness, implementation costs, the inability to physically examine patients, regulatory restrictions and concern for medicolegal liability have all been identified as barriers to the widespread adoption of telemedicine and virtual clinics by surgical specialties in particular, but like many things during the COVID-19 pan-

dem, forced by necessity the pace of change may be outside of our control.<sup>9,14</sup>

Our study was carried out under unique circumstances and therefore it is unclear how translatable our results are to routine care. A longitudinal approach would be beneficial to understanding patient and clinician reception and efficacy of service. In addition, many non-urgent cases were discontinued under lockdown and further review is required to assess the breadth of oral and maxillofacial care.

## Conclusions

The increasing use of virtual consultations at our institution has been perceived by clinicians to be a predominantly successful evolution of healthcare and will continue to increase. In particular, a clear attitude change among senior staff in the department in the wake of the COVID-19 pandemic was shown, as well as demonstrably low conversion rates to face-to-face consultations as a result of shortcomings in the telemedicine approach. Further work is required to understand the driving forces behind staff attitudes and the long-term adoption of telemedicine within the specialty of oral and maxillofacial surgery as restrictions ease.

## Conflict of interest

We have no conflicts of interest.

## Ethics statement/confirmation of patient permission

Approval was sought and granted by Clinical Governance and Staff Experience teams at the host organization. Patient permission not required

## References

- Chigurupati R, Panchal N, Henry AM, et al. Considerations for oral and maxillofacial surgeons in COVID-19 era: can we sustain the solutions to keep our patients and healthcare personnel safe? *J Oral Maxillofac Surg* 2020;**78**(8):1241–56.
- Al-Izzi T, Breeze J, Elledge R. Clinicians' and patients' acceptance of the virtual clinic concept in maxillofacial surgery: departmental survey. *Br J Oral Maxillofac Surg* 2020;**58**(4):458–61.
- Magennis P, Kumar N. Updated COVID Advice from BAOMS and ENT UK for our surgical teams. [Published online 13th April 2020 and accessible at [https://www.baoms.org.uk/\\_userfiles/pages/files/professionals/covid\\_19/omfs\\_ent\\_advice\\_13\\_april\\_2020\\_0021.pdf](https://www.baoms.org.uk/_userfiles/pages/files/professionals/covid_19/omfs_ent_advice_13_april_2020_0021.pdf)].
- Connor MJ, et al. COVID-19 pandemic – is virtual urology clinic the answer to keeping the cancer pathway moving? *BJU Int* 2020 [Epub ahead of print].
- Pollock K, et al. Embracing telemedicine into your otolaryngology practice amid the COVID-19 crisis: an invited commentary. *Am J Otolaryngol* [Epub ahead of print].

6. Tanaka MJ, et al. Telemedicine in the era of COVID-19: the virtual orthopaedic examination. *J Bone Joint Surg Am* 2020 [Epub ahead of print].
7. Kumar S, et al. Changing paradigms of dermatology practice in developing nations in the shadow of COVID-19: lessons learnt from the pandemic. *Dermatol Ther* 2020 [Epub ahead of print].
8. Sharma A, et al. Will teledermatology be the silver lining during and after COVID-19? *Dermatol Ther* 2020 [Epub ahead of print].
9. Blue R, et al. Telemedicine in the era of COVID-19: a neurosurgical perspective. *World Neurosurg* 2020 [Epub ahead of print].
10. Yellowlees P, et al. Rapid conversion of an outpatient psychiatric clinic to a 100% virtual telepsychiatry clinic in response to COVID-19. *Psychiatr Serv* 2020 [Epub ahead of print].
11. Olayiwola JN, Magana C, Harmon A, et al. Telehealth as a bright spot in the COVID-19 pandemic: recommendations for the “frontweb”. *JMIR Public Health Surveill* 2020 [Epub ahead of print].
12. Blackhall KK, Downie IP, Ramchandani P, et al. Provision of emergency maxillofacial service during the COVID-19 pandemic: a collaborative five centre UK study. *Br J Oral Maxillofac Surg* 2020 [Epub ahead of print].
13. Rimmer A. How can I break bad news remotely? *BMJ* 2020;**369**, m1876.
14. Makhni MC, Riew GJ, Sumathipala MG. Telemedicine in orthopaedic surgery: challenges and opportunities. *J Bone Joint Surg Am* 2020 [Epub ahead of print].