INTRODUCTION

The World Health Organisation declared the coronavirus disease (COVID-19) outbreak to be a public health emergency of international concern on 30 January 2020 and declared a global pandemic on 11 March 2020.1

The practice of clinical oral surgery necessitates the surgical team working in close proximity to the patient and often the use of a surgical drill.2,3 These aspects of care present risk of disease transmission as COVID-19 spreads primarily through droplets and fomites.4 Routine dentistry was suspended in China in January 2020 and in countries around the world as COVID-19 spread.5 The American Dental Association proposed on 16 March 2020 that dentists defer all elective dental care for 3 weeks. In Scotland, Wales and Northern Ireland, three nations of the UK, all aerosol-generating procedures (AGPs) were stopped on the 23 March and practitioners were told to stop all routine face-to-face dentistry on the 23 March.6 On the same day in New Zealand, all non-essential and elective dental treatment was suspended. England suspended routine dental care on 25 March 2020.
Whilst routine dental care was suspended, the need for continuing urgent care was recognised. In some countries, this was delivered by general dental practices whilst in the UK it was delivered by setting up designated Urgent Dental Care centres in hospitals but also in some primary care settings including general dental practices. Hospital-based oral surgery service was also transformed with the suspension of routine surgery and a focus on urgent care. Many general and specialist dentists and their teams were deployed to support medical care in critical care units, emergency departments, medical wards and even maternity services. Oral surgeons typically continued in their usual surgical roles because urgent care in dentistry commonly requires surgical expertise. Urgent care for many oral surgeons also includes the management of facial trauma with maxillofacial colleagues and contribute to the care of patients with oral cancer and these services were not suspended.

Whilst the pandemic was clearly spreading around the world from its origins in Wuhan, China, its arrival in Europe posed many questions for clinicians. This was a new disease with much unknown. The British Association of Oral Surgeons (BAOS) started to publish advice on 16 March 2020 to support their members based on the scientific literature from earlier pandemics, emerging COVID-19 literature, the behaviour of countries such as China including the Special Administrative Region of Hong Kong, Singapore, South Korea and our own national advice from the National Health Service (NHS) and Public Health England. There was a huge increase in guidance offered by international bodies and our own Royal Colleges and Specialist Dental Societies with regular updates in addition to the growing numbers of webinars and numerous social media sources. Oral surgeons much like other clinicians inevitably would feel overwhelmed and anxious, particularly as much of the advice was contradictory. Any change to oral surgery services would impact directly on the care usually offered to patients and the BAOS Council were anxious to understand this and the changes and anxieties being experienced by their members. The aim of this study was to survey the membership of 654 oral surgeons on a weekly basis at the start of the pandemic to explore the impact and response of UK oral surgeons.

Particular issues of concern to oral surgeons were around the changes to their practice and safety. Restriction on travel and safety of public transport were also relevant. As routine surgical care was suspended, we were keen to know what type of care was being provided and what procedures. The UK NHS provided guidance on what was to be defined as urgent care and focused predominantly on the management of pain and infection and was more limiting than in many other countries.9

Aware of the increased risk of disease transmission through close contact and AGPs, oral surgeons would be expected to be concerned for their patients, themselves and their teams and their respective households. Without a reliable testing system with the availability of rapid results it was impossible to know which patients were at high risk of transmission, particularly as it became apparent that asymptomatic patients could be carriers who could transmit the disease. Without a vaccine the use of Personal Protective Equipment (PPE) was clearly of paramount importance alongside other cross infection control strategies.10 There was much concern about what the appropriate level of PPE was for undertaking a clinical examination or surgical procedure that might be an AGP or a non-AGP. There were other factors to take into account such as the COVID-19 infectivity of the patient, their general health, age and newly emerging factors, such as race.

Alongside the type of PPE considered appropriate, there was early concern about the availability of PPE and that the government guidance and policy was being informed by availability and not based on scientific evidence.

Patient care would obviously be compromised if the oral surgical workforce was to be diminished because of COVID-19 infection or the need to self-isolate for 14 days. We, therefore, wanted to determine the impact of this on oral surgeons and their teams and whether or not this was an issue for patient care.

The economic impact of suspending routine dental and oral surgery care was of great concern to many and especially those undertaking independent private practice or with NHS short-term contracts in primary care.11,12 The cost of PPE, the additional steps in new patient pathways, and the much reduced, patient volume that could be managed safely due to the need to ‘donn and doff’ PPE, introduce additional cross infections measures including leaving the clinical space fallow between patient surgical treatments.

### CLINICAL RELEVANCE

**Scientific Rationale:** To investigate the impact of the covid pandemic on the oral surgery workforce in the UK.

**Principal Findings:** During the first phase of the pandemic, there was a significant reduction in the provision of oral surgery care for patients.

**Practical implications:** This significant reduction of provision of care is likely to impact on patient health and procedural waiting lists therefore creating further barriers to care for patients requiring treatment.

### 2 | STUDY METHODS

The BAOS membership was invited to participate in a survey constructed by the authors on behalf of the BAOS Council by email. The online ‘Survey Monkey’ tool was used for the questionnaire. All members were sent an email notification on a Monday when the survey opened and a reminder on Wednesday. The survey was open until Friday each week and respondents
were asked for information that covered a 7-day period ending Friday of each week. Week 1 ended on 3 April 2020.

2.1 | Demographics

We asked for information about the region of UK where they practiced, their professional role, setting (primary care or secondary care) and mode of transport to workplace.

2.2 | Care provision

We asked whether the oral surgeon had provided treatment for a known COVID-19 positive patient, the type of care provided and the approximate number of procedures.

2.3 | Personal Protective Equipment

We asked about the type of PPE being used, availability of appropriate PPE, any need to limit care provision because of the lack of available appropriate PPE, any need to deny care provision because of the lack of available appropriate PPE.

2.4 | Surgeon factors

We asked whether the surgeon had needed to self-isolate and the time period of isolation, and availability of testing if symptomatic.

2.5 | Work practice changes

We asked whether the surgeon had returned to work post-isolation, whether they were deployed to medical duties away from their usual oral surgery practice or to an urgent dental care role. If deployed to a new role was training provided, was there adequate support and clear line management in the new role, did they feel compromised in the new role, did they feel that they or others were in danger.

2.6 | Economic impact

We asked if the surgeon had suffered financial loss and the mechanism of any loss.

3 | RESULTS

A total of 400 responses were received over the 4-week period. Week 1 peaked with 201 responses, which then plateaued into week 4 at 78. The membership of BAOS was 654.

Table 1 shows the geographic location of respondents over the 4-week period. In week 1, London, the South West and North West had the highest number of respondents, with the West Midlands with the lowest number. Over the 4-week period the South West, North West and London remain the highest number of respondents.

Figure 1 reports the job title by the respondent, with the highest proportion being Staff and Associate Specialist (SAS) grades and Primary Care Oral Surgeons. This is consistent across the 4-week period of the survey. Another is a recorded category that some respondents completed, and open text included responses such as private, dental core trainee, dentist with special interest/level 2 provider and speciality doctor and one nurse.

4 | DISCUSSION

The BAOS members were invited to participate in an online 'Survey Monkey' questionnaire. The survey was open until Friday each week and respondents were asked for information that covered a 7-day period ending Friday of each week. Week 1 ended on 3 April 2020. Six hundred fifty-four members were emailed the link to the questionnaire. There were 201 responders for week 1 and then fewer for week 2 \( (n = 51) \), although an increase for week 3 \( (n = 70) \) and week 4 \( (n = 78) \). The poorer response rate may be explained by survey fatigue. This would not be unexpected given that the same questions were repeated weekly during a busy and anxious time that many would have been experiencing. The response rate needs to be considered when interpreting the data.

4.1 | Demographics

London, the South West and North West had the highest number of respondents, with the West Midlands having the
fewest. The response rate across the UK generally represents the population densities and therefore the density of oral surgeons. The highest proportion of respondents were SAS grade oral surgeons and oral surgeons in primary care (week 1 62%, week 3 78%, week 3 60% and week 4 71%) which is representative of the make up of the membership.

4.2 | Care provision

We asked about the type of care that the oral surgeon had provided for known COVID-19 positive patients (Figures 3

![Figure 1](https://example.com/figure1.png)

**Figure 1** Job title by respondent. Respondents roles are recorded in Figure 2 with the highest number of respondents each week from the secondary care National Health Service setting.

![Figure 2](https://example.com/figure2.png)

**Figure 2** Role of respondent

and 4). During the first week of the survey, the majority of respondents were providing emergency oral surgery procedures and prescriptions of analgesics and antibiotics. Telephone advice was also provided, and clinical examinations were undertaken, with some providing emergency restorative care. By the second week of the survey, the picture changed such that far fewer oral surgeons were providing emergency oral surgery procedures or clinical examinations or prescriptions, but they continued to provide a high level of phone advice. This pattern of care continued for weeks 3 and 4 of the survey. This was due to the shortage of PPE.

For those fewer Oral Surgeons that did have PPE, they undertook more examinations and provided more prescriptions with each than undertaking emergency oral surgery procedures initially; but, over the 5-week period, they were found to be undertaking more emergency oral surgery procedures per oral surgeon than providing prescriptions. Whilst oral surgeons also provided phone advice in far fewer numbers than examinations, emergency surgical procedures and prescriptions. This may reflect the timing of the setting up of urgent care and utilisation of general dental practitioners to deliver a telephone advice service. Also, as the availability of PPE and evidence on AGPs and infection control became more readily accessible surgeons became more confident to provide emergency surgical treatment rather than just phone consultations.

It is encouraging to observe oral surgeons continuing to deliver care including surgical procedures during the pandemic. Routine dental care was paused on 23 March, just ahead of the survey, and patients became increasingly concerned with the lack of access to dental care and the management of pain and infection.

4.3 | Personal Protective Equipment

The practice of dentistry is considered high risk during an infective pandemic such as COVID-19 because of the high volume of patients, the physical proximity of dental professionals to patients and each other and necessity for the use of AGPs. Inevitably at the start of a pandemic one might expect there to be a shortage of PPE so planning of services should ensure that this is available for the most urgent care.
There would therefore be an expectation that appropriate PPE would be available for oral surgeons. We asked about the type of PPE used, the availability of appropriate PPE, any need to limit care provision or deny care provision because of the lack of available appropriate PPE (Figures 5 and 6). This survey confirms the shortage of PPE available for Oral Surgeons as highlighted by the UK National press and media at the time.16

There was considerable debate about what type of PPE was appropriate for oral surgeons and the BAOS had an important role in presenting the known evidence and advice. Figure 5 shows the availability of PPE over the 4 weeks of the survey period. Items that were already part of the established pre-COVID-19 PPE such as gloves, surgical gowns, fluid-resistant surgical mask and aprons were readily available over the 4 weeks. Face visors were not always worn by surgical teams, with eyewear being preferred, but there was no issue with availability. There was however a significant problem with the availability of appropriate respirators. A Health and Safety Executive research report of 2008 described the need for future preparedness.17 The BAOS recommended the use of the FFP3 for AGPs at the height of the pandemic when the likelihood of treating a COVID-19 positive patient was high and we had little or no testing available.18,19 The use of an FFP3 respirator offers a filtration rate of 99% of all particles measuring up to 0.6 μm. Regular surgical facemasks used in dentistry, when correctly worn and frequently changed, offer around 80% filtration rate.17

As COVID-19 is highly contagious and dentistry is a high-risk profession for transmitting this disease because of the generation of aerosol through some procedures and the close proximity of the operator to the patient during treatment, oral surgeons would be expected to have been keen to use the protection of an FFP3. The shortage of these respirators was a national issue for all medical specialities and consequently, there was an initial approach by PHE to
encourage tooth removal without using this level of filtration. This is likely to have caused significant anxiety for oral surgeons. Several clinicians were forced to refuse treatment for their patients because of inadequate stocks of respirators as shown in Figure 8. This in itself would have generated further anxiety at having denied patients treatment.

4.4 | Surgeon factors

We asked whether the surgeon had needed to self-isolate and the time period of isolation, and availability of testing if symptomatic. Only a small proportion of oral surgeons were required to isolate as described in Figure 7. Clearly, a clinical service already disrupted will be reduced further if oral surgeons are required to isolate. This may be due to their being infected or of having been in close contact with someone infected. If testing of individuals had been available, then it would not have been necessary for all of those in close contact to isolate and be absent from care provision. At the time of writing, this problem has still not been adequately addressed. Currently, those developing symptoms are required to undergo testing and to self isolate for 10 days from the start of symptoms if found to be positive. This is very reasonable. However, those without symptoms found to be have been in contact with a positive individual are required to be in isolation for 14 days. If this individual is an oral surgeon, there is no NHS testing available and it may well be that the surgeon is not infective and would be more usefully employed treating patients. Testing clearly needs to be more readily available and prioritised for healthcare and other key workers. Figure 8 shows the very poor availability of testing for oral surgeons. In certain scientific institutions such as Cancer UK all staff are tested on a weekly basis thus creating a less anxious workforce that is not unnecessarily kept off for up to 14 days.
4.5 | Work practice changes

We asked whether the surgeon had returned to work post-isolation, whether they were deployed to medical duties away from their usual oral surgery practice or to an urgent dental care role. If deployed to a new role was training provided, was there adequate support and clear line management in the new role, did they feel compromised in the new role, did they feel that they or others were in danger (Figure 9).

In a pandemic, it can be very helpful for dental professionals to use their knowledge and skills in relation to medicine to contribute to medical care. In England when routine dentistry was suspended, there was an expectation that general dentists would offer urgent dental care or take up redeployment at one of the specially commissioned ‘Nightingale’ hospitals for COVID-19 patients.

In practice, the capacity created in the NHS and ‘Nightingale’ hospitals was not required in the volume expected. The ‘Nightingale’ hospital in London was built for an initial 2000 capacity with the capability of expanding to 4000 but received less than 100 patients. The number of general dentists that were redeployed to help with the medical effort was therefore very small. Oral surgeons would be expected to continue with their role of providing oral surgery care, but a small proportion was redeployed. Figure 10 shows the service of redeployment. Interestingly a number continued with oral surgery care but moved from primary care to secondary care.

4.6 | Economic

We asked if the surgeon had suffered financial loss and the mechanism of any loss (Figures 11 and 12). Oral surgeons employed by the NHS in secondary care had their income protected. The number of oral surgeons reporting financial loss reduced significantly over the 4-week period of the survey. Those offering hospital-based private practice care would have lost all income as private hospitals were required to take up NHS contracts and cases were assessed by NHS managers to ensure priority of patients with COVID-19 disease management.
FIGURE 10  Percentage of respondents redeployed in first month. It is quite surprising that this is a low number as the initial ‘call out’ from National Health Service England and DOH suggested there would be a lot of redeployment.

FIGURE 11  Redeployment location. Respondents who reported financial loss over 4-week period. As the weeks progress there is an increasing awareness of the impact of COVID 19 restrictions on practice economics.

FIGURE 12  Reasons for financial loss over first 4 weeks. Nearly 50% of respondents over all 4 weeks cite personal reasons for financial loss.
5 | CONCLUSIONS

Because of the infection risks associated with aerosol generated procedures and the need for fawl time, oral surgery services have been severely reduced since late March 2020. This survey described the early impact on BAOS membership and patients.

Telephone advice was rapidly introduced ahead of clinical examinations and by the second week of the survey, the picture changed such that far fewer oral surgeons were providing emergency oral surgery procedures or clinical examinations or prescriptions, but they continued to provide a high level of phone advice. This pattern of care continued for weeks 3 and 4 of the survey. This was due to the shortage of PPE. Several clinicians were forced to refuse any treatment for their patients because of the inadequate availability of respirators.

For those fewer Oral Surgeons that did have PPE, they undertook more examinations and provided more prescriptions with each than undertaking emergency oral surgery procedures initially; but, over the 4-week period they were found to be undertaking more emergency oral surgery procedures per oral surgeon than providing prescriptions.

Only a small proportion of oral surgeons were required themselves to isolate and only a small proportion were redeployed. Interestingly a number continued with oral surgery care but moved from primary care to secondary care.

The COVID-19 global pandemic continues to impact on the ability to provide the same level and intensity of oral surgery services in both primary and secondary care settings. This will undoubtably have huge negative effects on patients and providers of oral surgery services particularly those working in primary care settings.

As services gradually return to normality, there is considerable variation in the guidance being issued on the safety procedures required and no clear funding streams to implement changes such as safe ventilation. We, therefore, need to examine how new opportunities can be created from this crisis to rethink the future delivery of oral surgery services and address inherent system failures.

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How to cite this article: Moore R, Keshani D, Coulthard P. (2022). UK oral surgeons’ early response to the COVID-19 pandemic and impact on patient care. Oral Surg. 2022;15:315–323. https://doi.org/10.1111/ ors.12726