BAPD RETURN TO PRACTICE POSITION PAPER

MAY 2020

BRITISH ASSOCIATION OF PRIVATE DENTISTRY

INTRODUCTION

This paper has been commissioned by the British Association of Private Dentistry (BAPD) and is designed to be a useful reference for Dental Professionals and Key Stakeholder Groups, both in the United Kingdom and abroad, to help understand the current position of the UK dental industry during the COVID19 crisis. The information within the paper is designed to help the industry in its return to normal clinical working practices. It should be read with a clear understanding that it outlines our starting point as we begin discussions with other stakeholders to plot the way back. It addresses key issues such as our current situation, the current legal and economic position alongside an analysis of the response of comparable countries overseas, and most importantly the BAPD position on PPE and infection control measures since this seems to be a point of considerable confusion within the industry. The reader should note that whilst this paper provides a strongly evidence-based overview of our current status, the topics discussed are broad and further research is needed in many areas. It is evident that data is changing by the hour and that revisions may be made in the coming days, weeks and months as we consult with others.

COVID- OUR CURRENT UNDERSTANDING FROM A DENTAL PERSPECTIVE

In the space of four months, what started as reports of a small series of atypically presenting pneumonia cases within Wuhan, the capital of Hubei province, Central China, evolved into a catastrophic worldwide scourge. (J. Zhang, 2020). The situation is redolent of the 1918 Spanish Flu Pandemic in scope, but unique as a coronavirus (SARS-CoV-2), that has finally combined the infectivity of the common cold with the complex, multi-system clinical destruction seen with the 2003 Severe Acute Respiratory Syndrome (SARS) (Y. Guan, 2003) and 2012 Middle East Respiratory Syndrome (MERS) infections. (Z.A. Memish, 2014).

As dental professionals, we have existing expertise at implementing universal precautions and a consistently high level of cross infection control. (R. Shah, 2009) and there is currently no evidence anywhere in the world of excess SARS-CoV-2 infections within dentist and dental care professional (DCP) populations. (T. Cook, 2020) (C. Heneghan, 2020) (Chustecka, 2020). Additionally, there are no reports of Super Spreader Events (SSEs) or "hotspots" for patient or dental non-clinical staff member infections with SARS-CoV-2 anywhere, worldwide. (Kay, 2020)

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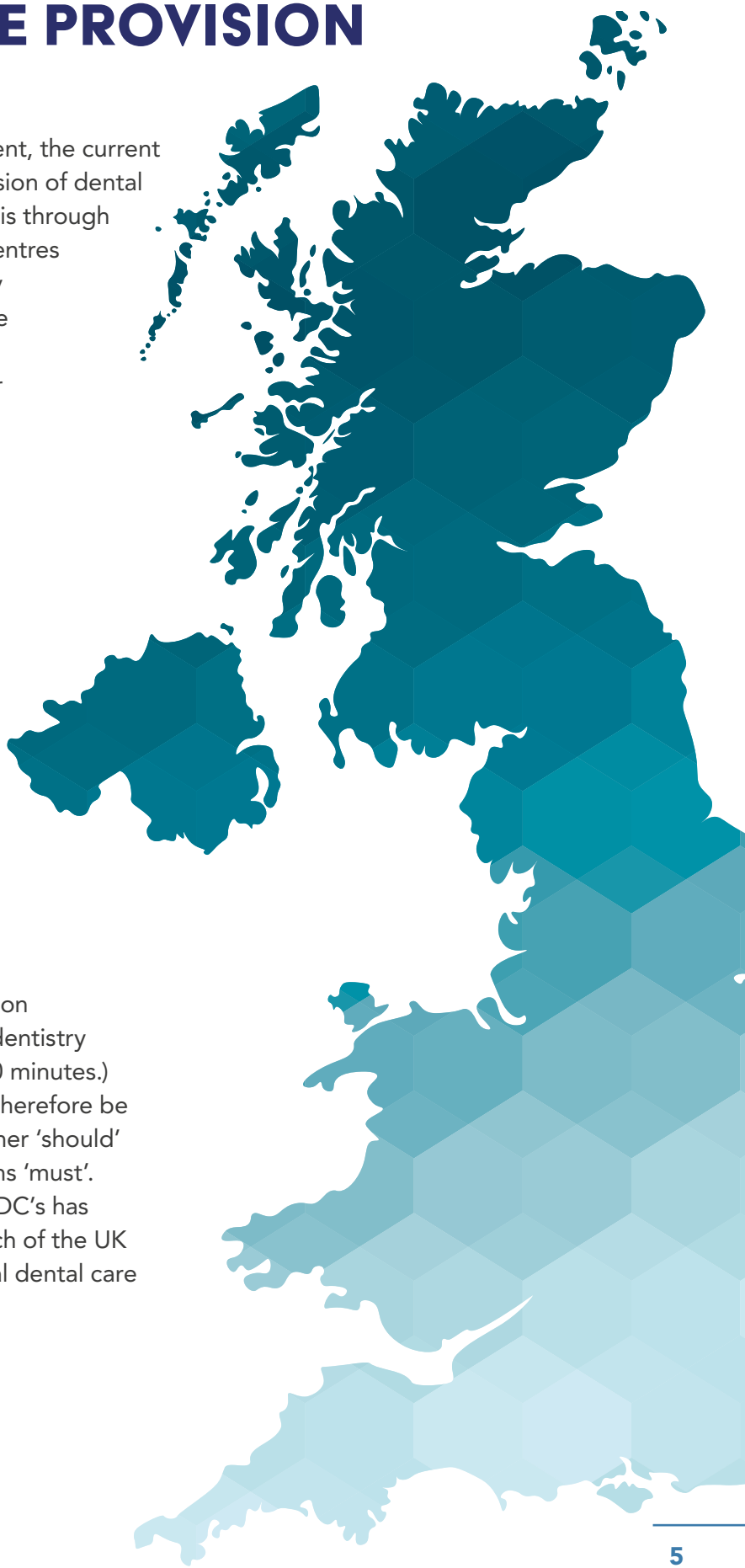
CURRENT STATUS OF UK DENTAL CARE PROVISION

At the time of writing this document, the current position with regards to the provision of dental treatment in the United Kingdom is through the utilization of Urgent Dental Centres (UDC). These are set up regionally via the Local Area Teams. They are generally provided by larger NHS Contract Holders, and it is unclear if any tendering process has been undertaken, or whether there is some form of 'favoured provider' scheme in operation.

With the exception of the UDC's, all other Dental Practices are currently closed to face to face patient contact and therefore routine dentistry. This is as a direct consequence of instruction from the Office of the Chief Dental Officer (OCDO) on the 25th March 2020. (CDO 3rd Letter March 2020). This communique indicated that it was a requirement for all routine dentistry to cease on this date. A subsequent Webinar by the CDO on 24/4/2020 indicated that routine dentistry should cease on that date. (at 7.00 minutes.) (CDO 2nd Webinar 2020). It may therefore be open to interpretation as to whether 'should' in this case actually in reality means 'must'. The provision and set up of the UDC's has been somewhat slow, leaving much of the UK populus without any interventional dental care in the meantime.



As a result of the closure of practices to 'Face to Face' (f2f) patient contact, remote consultation and triage has been implemented by all dental practices. The requirement is for practices to provide AAA (advice, analgesia, and antimicrobials where appropriate) services to their regular patients, both NHS and Private. Irregular attenders currently appear to only have the NHS111 service to rely on. It has become apparent that many of these patients have been unable to access the NHS111 service effectively and therefore have been forced to ring multiple practices in order to gain advice. In order to aid with the new form of remote prescription, antimicrobial prescribing guidance was issued, as was analgesia advice. (FDGP 2020, SCDEP 2020).

With the move to 'AAA' treatment, it was expected that the UDC's would quickly open to provide a hub to refer those patients who needed active treatment and for whom the 'AAA' protocol was not sufficient or was inappropriate. Referral to a local UDC was therefore indicated when necessary for face to face consultation and treatment where possible. It was decided generally that aerosol generating procedures (AGP) were to be limited unless absolutely necessary. There has however been no definition of 'absolutely necessary' so many teeth are extracted rather than accessed for future root canal treatment. Indeed, the 1st webinar given by the Chief Dental Officer appeared to deliver a confused and at times contradictory message of this point. (CDO 1st Webinar 2020).

The provision of UDC's would be in addition to the continued access for 2 Week Wait referrals for suspected suspicious lesions using the normal mechanisms of referral. There would be different UDC sites for shielded and non-shielded patients in order to reduce the risk burden on those members of the public who were at the highest risk and already likely to be self-isolating. Specific sites were also put in place for symptomatic Covid-19 patients, named 'hot' sites. All other sites were classified as 'cold' sites.

There exist Standard Operating Procedures (SOPs) for the provision of care within the UDC's. The latest version was published on 15/4/2020. (NHSE SOP 2020). These documents were not available at the instigation of the cessation of routine dental treatment, so there was a hiatus between the instruction of the OCDO to cease routine dentistry, and the rolling out of an active service in the UDC's. This resulted in delays to the active treatment of some patients who were no longer able to be adequately provided for by the 'AAA' protocols, yet unable to access f2f treatment. There are likely to be slight differences in the details of SOP in different regions depending on local needs, requirements and commissioning differences, but fundamentally the protocols used in the service seems consistent. Strict adherence to the SOP is a requirement of the continued operation of the UDC.

There are different SOP's for use in the devolved administrations (Health Protection Scotland 2020, Health and Social Care Board 2020, Welsh Government 2020), with dental practices in Wales still being allowed to see their own 'cold' emergency patients if it is necessary to do so; the caveat being that AGP's should not be used. There is still the facility to refer into the UDC's. The situation in Northern Ireland is similar to that in Wales, where patients who meet the urgent criteria can still be seen in practice if they are fully risk assessed as to their Covid Status. The treatment to be provided again must not include AGP. The logistics of any of this treatment in general practice will depend on whether any of the practices in these devolved administrations have the manpower to see their patients. Given that many practices may have fully or partially furloughed their staff depending on their NHS commitments this may be one of the problems encountered. In addition, there remain issues with sourcing the appropriate PPE for use in the dental setting.

The Number of Hubs currently open as at 24/4/2020 stood at 264 sites. This is thought to have increased slightly. A further expansion of the UDC concept was announced with the 4th CDO Letter 1/5/2020, (CDO 4th Letter May 2020) with regions being asked to provide greater coverage of the service. This coverage however is still restricted to NHS practices. There were no further details at the time of writing as to exactly what this further expansion entails.

Patient referral into the hubs can be problematic in some areas without NHS.net email addresses. As a result, some private practices have limited or no access to the UDC's for their patients. It has been suggested as one alternative that private practices 'buddy up' with local NHS practices in order to access the UDC in their region. There still appear to be issues with obtaining an NHS.net email account despite the CDO's assurances that it is now far easier to obtain this type of email address. (CDO 2nd Webinar 2020).

Other Problems also continue to exist within the UDC's including the continued supply of PPE in some areas. Some regions were resorting to purchasing their own PPE and sourcing fit testing, (Derbyshire LDC 2020), through LDC support because it was felt that a higher level of PPE than that recommended by PHE was prudent for the safety of all the staff deployed in the UDC's, and the lack of clarity as to the Employers' liability and Death in Service aspects of team members working within the UDC's. This has now had to cease due to the PPE not being sourced through the NHS Supply chain. Some practices were also reporting having higher numbers of patients than agreed in the SOP without sufficient wait time for aerosol to settle between patients. (Derbyshire LDC 2020).

It has been reported that funding issues have resulted in 3 out of 4 hubs in Hertfordshire closing down. (Dentistry Magazine 2020).

Hubs normally operate on central triage (2nd level) then referral on to treatment to the UDC. This means that the referring practice will already have triaged using the 'AAA' protocol before then referring for this second level triage. In some cases, the patient is still rejected at this stage and appeals then have to be made by the referring practitioner. Delays are therefore often inevitable and, in some cases, unnecessary, before treatment is provided.

Concerns with the 'AAA' protocol exist within the profession because the treatment of inflammatory pain using antibiotics is not recommended in the normal dental treatment for pulpitis. Antimicrobial stewardship is a significant clinical responsibility of all dental practitioners. (Antimicrobial Toolkit 2019, FGDP 2020). However, if antibiotics have not been provided by the dental practitioner following the 'AAA' protocol and a subsequent referral is made, it is common for the UDC's to reject the patient for treatment until these have been prescribed, despite them not necessarily being the appropriate treatment modality for the type of problem the patient presents with. An extirpation of the pulp would often be a more appropriate treatment modality, but it appears these are not necessarily the treatments being provided as they are AGPs, and therefore appear to have been significantly curtailed. This flies in the face of the normally accepted treatment that would be provided. Many teeth can be saved with the appropriate provision of minimal AGP procedures to open and dress teeth rather than provide antibiotics or wait until extraction is the only option.

In addition, there remain problems with the administration and dispensation of remote prescriptions to patients in general dental practice. (CDO 2nd Webinar 2020).

Data was present for Scotland showing that just over 50 COVID-19 Positive or isolating patients have been treated in the 'hot' UGC's. (BDA Data 2020). There have been almost 2700 Non-COVID-19 patient attendances in the same period. There appears to be no published data available yet regarding the treatments provided in the hubs in the other UK nations at the time of press.

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UK DENTAL PRACTICE: CURRENT REGULATORY POSITION

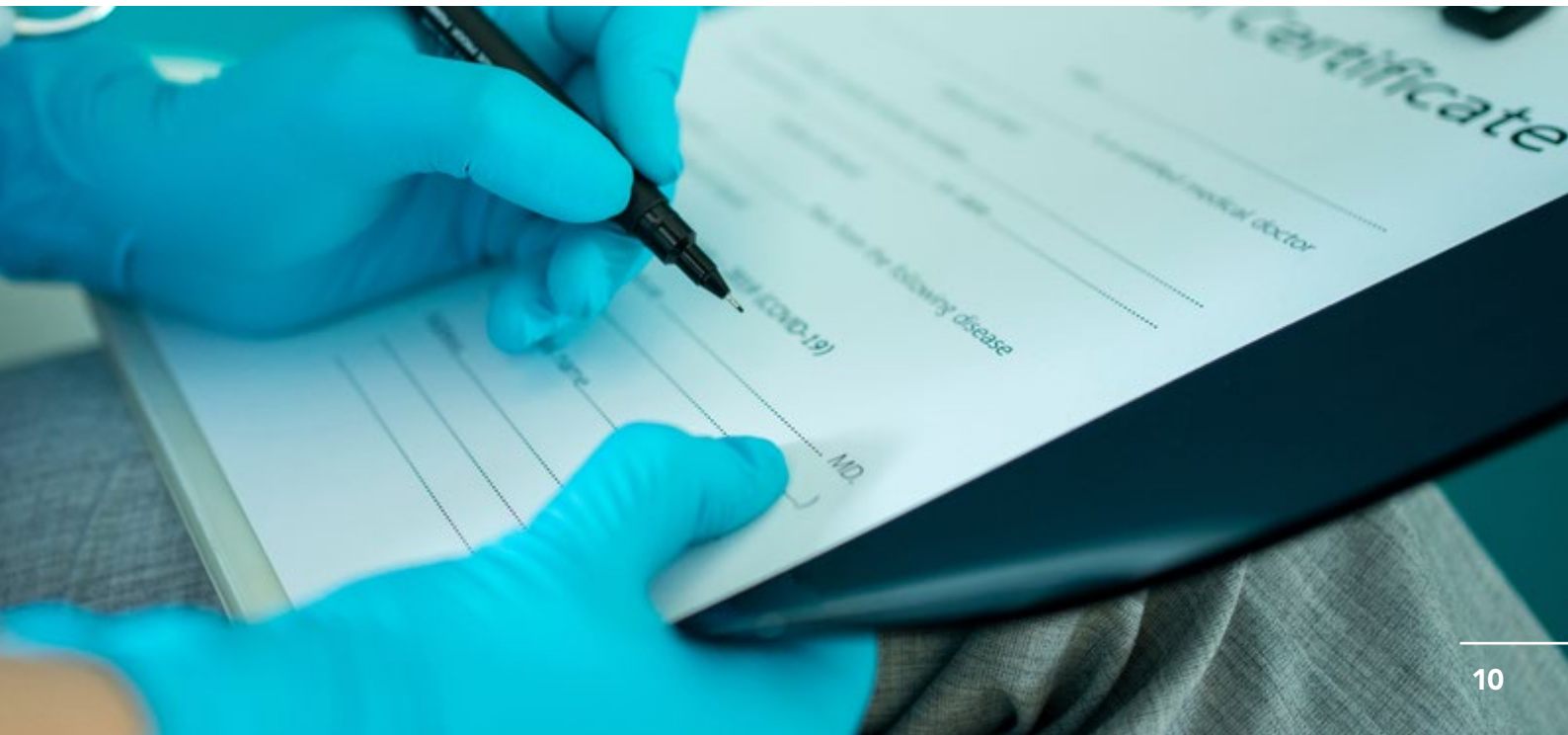
This is a summary of the most recent guidance and positions of the relevant authorities for private dental care in the UK: some aspects of advice vary throughout The United Kingdom; specific advice for England, Scotland, Wales and Northern Ireland is included where relevant.

The Care Quality Commission (CQC)

On 3rd April, the CQC emailed Providers and said:

'The number of operational urgent dental care centres are now increasing and your local NHS England (NHSE) contacts will be able to provide you with details of referral pathways for patients who need active treatment.
The Chief Dental Officer (CDO) has also released further information on a number of issues, including on the operation of urgent dental care centres and personal protective equipment. NHSE have also released a Standard Operating Procedure on urgent dental care centres.

The advice and guidance given by the CDO has a clear aim in supporting the government agenda of reducing the risks of COVID19 transmission within the general population. We would encourage dental providers to give proper consideration to the letter from the Chief Dental Officer whether your practice is NHS, private, or mixed.'



Office of the Chief Dental Officer of England

It is clear that the CQC strongly supports the view expressed by the Chief Dental Officer by referencing and referring to the following letter from the Chief Dental Officer for England in their on-going communications with Providers.

This letter said:

'We recognise that since our letter of 25 March, as regions have been developing their UDC systems, it has been necessary for some practices and clinicians to see an urgent patient face to face with appropriate PPE when other (AAA) measures have failed or are not appropriate. In the absence of an NHS-designated UDC service, a dental practice may undertake non-AGP face-to-face dental assessment and care with Level 2 PPE. This has been recognised by the CQC and GDC as an appropriate response in the best interests of the patient. ***As UDC systems become operational, individual practices, unless they are identified by regions as part of the system in a region, should not see patients face to face unless there is no UDC system provision available****. Any face-to-face treatment must be delivered in line with the guidance set out in the SOP.'*

Health Protection Scotland

Guidance issued on 2 May 2020 contained the following entry in respect of primary care dental services:

'Individuals should not attend for routine dental treatment whilst the stay at home advice is in place. ***Delivery of dental services has been restructured under the direction of the Chief Dental Officer and Scottish Government.***

Practices should ensure that patients are advised in advance of their appointments not to attend and defer their treatment. Dental practices should triage calls by telephone and offer clinical advice. Where face to face assessment is required, ***dental practitioners should follow locally agreed protocols which may include assessing people in a local dental hub****. Where patients are being seen for a face to face assessment, follow the COVID-19: Infection Prevention and Control PPE guidance in Table 1 or Table 2 as appropriate. Additional Standard Operating procedure for dentistry can be found in Annex 1: Infection Prevention and Control in Urgent Dental Care Settings during the period of COVID-19.'*

Office of the Chief Dental Officer of Wales

The latest guidance from Wales dated 3rd April 2020 contains information on what can and cannot be done in Wales during the Red Alert Phase Escalation and states the following:

*'The aim of escalation of this phase is to ensure delivery of core urgent/emergency dental services by **centralising sites for service delivery** and minimising the risks of transmission associated with dental procedures.'*

Role of General Dental Practice Teams (not U/EDDCs)

Practices are required to ensure that their patients can continue to have telephone access to the practice for advice - during normal surgery opening hours - practices can collaborate and participate in local rotas to provide:

- *remote/telephone consultations and patient triage;*
- *advice;*
- *antibiotics/ other urgent prescriptions as required;*
- *analgesia;*
- *a brief clinical assessment of urgent problems for non-covid patients (where deemed necessary following telephone/remote consultation);*
- *Simple non-aerosol generating procedures (non-AGP) for urgent/ emergency dental problems following risk assessment;*
- *Onward referral to designated urgent/emergency centres for severe cases where referral is absolutely necessary (suspected/confirmed COVID19 and for high risk of aerosol generation non-COVID patients).'*

Northern Ireland

The most recent position for Northern Ireland was published on 27 April 2020 and contained the following entries within a FAQs document:

'Q: *Which patients can I see in my practice?*

A: *Non-COVID patients but only if urgent or emergency care is required.*

Q: *Are the guidelines different from those in the UK and Ireland in regards to treatment being provided in the practice?*

A: *The Wales "Primary Care Dental Services COVID-19 Toolkit" was published on 22 April 2020 indicates that non-AGPs may be provided within dentists own practices if urgent or emergency care is required.*

Health Protection Scotland issued their "Guidance for Primary Care" on 16 April 2020 with section 9 indicating that face-to-face care and treatment is permissible within dentists in own practices if urgent or emergency care is required although ***arrangements at local health board level may vary.'***

Please note that the latest information from Health Protection Scotland is more recent so takes precedence over this last statement.

The General Dental Council position

The GDC has issued the following statement on their guidance for dental professionals webpage:

'We've received some questions from professionals in private dental practice about whether they're able to continue to see their patients who have urgent dental treatment needs, and whether this might put their registration at risk. We have no powers to direct a professional either to offer treatment or to refuse to offer treatment. That decision can only be taken by the professional responsible. As always, all professionals should work in a way which ensures the health, safety and wellbeing of their patients and colleagues and should only provide treatment where it is safe for them to do so. The process of determining whether it is safe will involve carrying out the necessary risk assessments and having regard to relevant guidance issued by professional bodies, the government, other statutory bodies and ***the NHS****.*

The GDC's statement hyperlinks back to the CDO documents from each jurisdiction. Accordingly, it is clear that the GDC strongly supports the positions set out by the CDOs.

Summary

Although there appears to be the scope and even expectation for low risk (non-COVID non-AGP) emergency patients to be seen by their usual practice in Wales and Northern Ireland there is a clear directive to centralise dental services across the UK for a (currently unknown) period of time.

Anyone who intends to see a patient face to face for provision of dental care in England and Scotland will need to be able to robustly justify the reason for doing so and similarly justify why that patient was unable to be referred to a UDC or unable to access a UDC. Whilst it may have taken longer in respect of England, the UDC system has developed and has become more operational: It will therefore be increasingly difficult for private practices in England to justify seeing patients for emergency care.

If a private dentist wishes to act against the direction of the CDO in their region of the UK, the dentist will need to ensure they have appropriate indemnity cover in place. The issue is not simply if a complaint arises from a patient who was given face to face treatment outside of the UDC system, but for example whether the CQC will decide to instigate enforcement action against the Provider operating the dental practice. In the event that the CQC did take enforcement action the issue could lead to fitness to practise proceedings which could negatively impact on the registration of the dentist.

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CURRENT AND POST COVID ECONOMIC STATUS OF UK DENTAL PRACTICE

It is estimated that private dentistry accounts for at least 50% of all dental expenditure in the UK as indicated in the LaingBuisson report into UK dentistry. The market value of dentistry in 2017/18 was £7.1 billion, made up of £3.6bn of private sector spend and £3.5bn of NHS spend. Other commentators (Clearwater) have provided slightly more bullish figures. Private dentistry increases patient choice by providing a broader, more comprehensive range of treatments than what is available within NHS scope of practice (e.g. Implants and Facial Aesthetics) in addition to supporting the NHS by increasing dental access in communities where there are capacity issues within NHS practices.

The Government continues to pay contracted revenue to NHS practices during the COVID Crisis; however, private practices receive little to no revenue at all, with only limited support in terms of loans, meaning the impact of Covid-19 on private dentistry is significant. When dental practices return to business, there is a concern that patients may be slow to return to private dentistry, given that it is a discretionary spend within a potential economic downturn, and may move back to NHS care, further increasing pressure on the NHS..

Private practices will be affected through increased spend on PPE, potential capital expenditure, a likely reduction in the number of general hygiene appointments and the limited procedures that can be done without performing AGP's for a period of time, a reduced throughput of patients and/or longer opening hours due to additional decontamination procedures between patients and thus potential longer hours for the dental team.

The financial concern for the dental industry is illustrated by the rating agency, Moody's Investor Services, changing its investor rating of IDH (Mydentist) to negative on 30 April 2020. IDH is the largest Dental Corporate in the UK: 601 practices (at the time of writing) with a revenue split of 26% private and 74% NHS. The reason for this is the expectation of a significant reduction of dental patient volumes of up to 50% for the fiscal year ending 31 March 2021 as a result of the closure of all practices to routine treatments in accordance with government and NHS guidelines in addition to the uncertainty as to how dentistry will be practiced and delivered following our return to work.

It is anticipated that the break-even level of earnings before interest, tax and depreciation and amortisation for most private practices occurs where the revenue is 62% of pre-Covid-19 revenue and even achieving 75% of normal revenue, the overall profitability of a practice will be reduced by 66%. If the drop is as severe as 50% as the expectation of Moody's Investor Services, every private practice would be loss making.

The example below illustrates the impact on profitability with a drop in revenue at various levels and is based on a typical private practice built up from the financial information of over 150 private practices, where BAU is business as usual in the pre- Covid 19 world. The financial metrics are also consistent with data contained in industry reports published by Christie & Co and Dental Elite; both organisations work extensively in selling and valuing dental practices.

		BAU	62% of BAU Break-Even	50% of BAU	75% of BAU
Revenue		850,000	524,468	425,000	637,500
Cost of sales	53%	(450,500)	(277,968)	(225,250)	(337,875)
Gross profit	47%	399,500	246,500	199,750	299,625
Overheads	29%	(246,500)	(246,500)	(246,500)	(246,500)
EBITDA	18%	153,000	0	(46,750)	53,125
		18%	0%	-11%	8%

The example above assumes the overheads are largely fixed (e.g. rent, staff salaries) and that the revenues are for a full 12 month period, however the likelihood is that when practices re-open it will take a number of months to achieve even 50% of pre Covid-19 revenues and the financial implications for the 12 month period could in fact be significantly worse.

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PPE: CURRENT SCIENCE

Our recent survey of UK dental professionals adds to the emerging evidence base for the reassuring position, that our pre-existing universal precautions and cross-infection control standards, safeguarded our profession work-related excess risk of SARS-CoV-2 infection. (A. Haigh, 2020)

A meticulous review of the scientific literature pertinent to bio-aerosols, viral aerosols and dental aerosol generating procedures (DAGPs) has allowed our scientific subcommittee to distil the necessary back-ground research to an optimum starting-point for a detailed review of the primary infective modalities of SARS-CoV-2. (WHO, 2020)

The previous breadth of work on Coronavirus respiratory pathogens clearly shows droplet ballistic and surface fomite spread as primary infective vectors.

A recently published accelerated article preview in Nature Research has provided some early evidence of SARS-CoV-2 viral RNA from patient toilet and soiled PPE doffing facilities at two Wuhan hospitals. Acknowledged limitations of the study include the use of viral RNA, which can be from dead, denatured or live virus. In addition, faecal aerosolization from toilet flushing is an acknowledged confounder. (Y. Liu, 2020)

A recent opinion piece on dental aerosols by Dominic O'Hooley, provides his considered viewpoint on this. (O'Hooley, 2020) (See Appendix 1, Table 1)

This brings us to specific proposed modalities for risk mitigation as we move towards the reestablishment of full dental service provision in the UK.

Masks

Looking specifically at how much extra protection the FFP3 mask offers over the FFP2 or a standard fluid-resistant surgical facemask (Type IIR), when worn during aerosol generating procedures (AGPs) in dentistry. The short answer is very little. (Howe, How much extra protection does an FFP3 mask offer in the dental surgery?, 2020). This is backed up by the second paper cited here: (Richards, 2020)

Eye Protection

There is no direct evidence from randomised trials that eye protection equipment alone prevents transmission of COVID-19. Indirect evidence suggests that healthcare workers' (HCW) conjunctivae could be exposed to infective droplets during close contact. A risk assessment should be carried out and appropriate PPE should thus be worn. (Howe, What is the efficacy of eye protection equipment compared to no eye protection equipment in preventing transmission of COVID 19 type respiratory illnesses in primary and community care? (Khunti, 2020) , 2020)

Air Purifiers

Looking first at wall and ceiling mounted air purification systems with HEPA filtration and other adjuncts including UV light sources and plasma filters, the short answer is that there is no evidence to support their use within dental surgeries to reduce risk of infection from SARS-CoV-2. Reports from hospital facilities are broadly confounded by the laminar air flow nature of the reported facilities.

Now to look at free-standing air purification units for SARS-CoV-2 virus infection risk reduction in dental surgeries. These provide no evidence at all of any effect whatsoever. (Howe, How effective are free-standing clean air systems in dental practice?, 2020) (See Appendix 1, Table 2)

Mouthwashes

It is clear that evidence of virucidal activity is well established for three of four potential pre-operative mouthwash modalities; 0.1% povidone iodine (PI), 1.5% hydrogen peroxide (HP) and 0.05% hypochlorous acid (HOCL). For 0.2% chlorhexidine (CHX), it appears to have relatively poor virucidal activity.

All four have poor microbial substantivity, with the benefits being lost in a few minutes. A weak positive recommendation can be provided for the most palatable and easily available of the three with good virucidal activity, 0.5% hydrogen peroxide (HP). (Howe, Mouthwash; can it reduce levels of Covid-19 in the mouth?, 2020)

In conclusion, the efficacy of dental cross-infection control and universal precautions provide a sound basis for the return to timely full operation for UK dentistry. Use of pre-operative mouthwashes, rubber dam (procedure specific), high volume aspiration, surgical facemasks and face shields are all recommended.

Appendix 1, Table 1

Study	Subject Group	Confirmation of SARS-CoV-2	Number infected	Observation
Hunter E, Price DA, Murphy E, et al1	1,666 SARS-CoV-2 tests in 1,654 staff.	RT-PCR (RdRp assay; Public Health England)	14% (240)	• No evidence of a significant difference between the occupational roles [clinical or administrative] of staff that underwent testing. • Nosocomial transmission from patients to staff was not an important factor. • Personal protective equipment appear sufficient to prevent high levels of nosocomial transmission to frontline staff. • The data appears to reflect wider patterns of community transmission
Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)	>40,000 HCW 476 Hospitals	RT-PCR	<5.14% (2,055) HCW	• Investigations among HCW suggest that many may have been infected within the household rather than in a health care setting • Transmission within health care settings and amongst health care workers does not appear to be a major transmission feature of COVID-19 in China • HCW infections most were identified early in the outbreak in Wuhan when supplies and experience with the new disease was lower
Kluytmans M, Buiting A, Pas S, et al2	1,353 HCW	RT-PCR	6% (86)	• Probably caused by acquisition of the virus in the community during the early phase of local spread
Folgueira MD, Munoz-Ruiperez C, Alonso-Lopez MA, et al[3]	Hospital 6,800 staff 2,085 HCW tested	PCR	11.6% (791)	• No statistically significant differences in the proportion of SARS-CoV-2 positive PCR detection between HCW from high risk areas involved in close contact with COVID-19 patients in comparison with clerical, administrative or laboratory personnel without direct contact with patients. • The evolution of cases during the same time period (March 2020) between patients attending the ER and hospital staff suggests that both groups were driven by the same dynamics
Heneghan C, Oke J, Jefferson T[4]	COBR press release 16th April 2020	'NHS swab' & 'commercial swab'	30.5% (1,408/ 4,618) estimate	• To work out the HCW related infection rates overall is difficult. • Assume that 20% of the Pillar 1 'critical key workers' are HCW related • Reducing transmission in hospitals and amongst HCWs remains vital to resolving this outbreak.
Meng L, Hua F, Bian Z[5]	1,098 dental staff and 828 student	Not provided (symptoms?)	0.47% (9)	• Prior to additional SARS-CoV-2 precautions • 6 dental professionals • 2 administrative staff • 1 postgraduate student

Study	Subject Group	Confirmation of SARS-CoV-2	Number infected	Observation
Meng L, Hua F, Bian Z[5]	169 emergency dentists	Not provided (symptoms?)	0.0% (0)	• Treated >700 patients with emergency dental treatment 24 January 2020 – publication (12 March 2020)
Wang D, Hu B, Hu C, et al[6]	138 hospitalised patients	RT-PCR	100% 29% (40) HCW	• More than 25% (10) health care workers in this department were presumed to have been infected by a single super spreader patient.
FNOMCeO[7]	59,372 dentists (2015)[8]		15 deaths	• 72.1% Italian dentists >45 years[8] • 7.1% Italian dentists >65 years[8]
Haigh A, Vasant R, O'Hooley D[9]	2,888 dental professionals	Self-reported COVID-like symptoms	8.4% (242)	• Initial findings from this survey would suggest that dental professionals have not experienced disproportionately higher levels of COVID-like symptoms

Risk of transmitting disease between HCW and household.[10]

- No studies found that examined social distancing of asymptomatic healthcare workers from family members within the home.
- People should be cautious of this step given the increased risk of isolation and anxiety it may bring.
- Symptomatic healthcare workers should follow guidelines for self-isolating in the home.
- Healthcare workers can take other measures to protect family such as hand hygiene both at home and on return from work and using correct personal protective equipment at work, where available.

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Appendix 1, Table 2

Study	Subject Group	Observation
Dungi S, Ghia U, Mead K, Gressel M.[1] The National Institute for Occupational Safety and Health (NIOSH): Engineering Controls[2]	Engineering Controls To Reduce Airborne, Droplet and Contact Exposures During Epidemic/ Pandemic Response	• No evidence of a significant difference between the occupational roles [clinical or administrative] of staff that underwent testing. • Nosocomial transmission from patients to staff was not an important factor. • Personal protective equipment appear sufficient to prevent high levels of nosocomial transmission to frontline staff. • The data appears to reflect wider patterns of community transmission
Centre for Disease Control Mead KR, Feng A, Hammond D, Shulman S[3]	Expedient Methods for Surge Airborne Isolation within Healthcare Settings during Response to a Natural or Manmade Epidemic (In-Depth Report)	• Non-localised systems will fail to respond to cough • A single cough generated about the same number of droplets as thirty seconds of talking and the same number of airborne droplet nuclei as five minutes of talking. Perhaps even more important was the observation that almost half (49 percent) of the cough-generated droplet nuclei remained suspended more than thirty minutes following their generation, as opposed to only 6 percent of the talk-generated droplet nuclei over the same time period. • The expedient airborne isolation configurations discussed in this research were all constructed and evaluated within traditional hospital facilities [accept should have been tested in other settings] • Most provide better real-time source protection from infectious aerosol than that expected to result from an N95 respirator. In several cases, the protection is several times better. These findings are not intended to replace the respiratory protection guidance provided to healthcare workers; however; the additional reduction in contaminant concentrations will lessen the dependence upon the N95 as the last line of airborne defense. • Only contained negative ventilation system. Impractical for dentistry.
Memarzadeh F, Elsworth P, Jiang JY[4]	Model	• Comparison the use of ultraviolet germicidal irradiation (UVGI) with increased ventilation flow rate to minimize the risk from airborne bacteria in hospital isolation rooms. Results show that the number of particles deposited on surfaces and vented out is greater in magnitude than the number killed by UV light • The number of viable particles in the room is generally lower for high exhaust systems compared with low exhaust system cases for the low to medium ACH values considered • Impractical for dentistry - negative ventilation system
Li Y, Leung GM, Tang JW etal[6]	Systematic Review	• Ventilation plus recirculating air filtration could reduce droplet nuclei concentrations with 30%–90% effectiveness • Recirculating air through the UV radiation unit can be very effective to disinfect the air. Equipment within the ventilated space close to the ceiling, where human exposure is minimal. Ceiling mounted units do not exist in dentistry • The effect of occupancy on ventilation of health care functional spaces has not been researched in detail • Many models become probabilistic with simplifying assumptions (e.g., single hit model) to quantify risk. Any experimental infection test is valid only for the particular setup of the experiment and is di cult to generalize • Models are extremely sensitive to initial and boundary conditions. Some of this uncertainty is irreducible. For example, people cough or sneeze with unpredictable directions, strengths, and locations

Study	Subject Group	Observation
Li Y, Leung GM, Tang JW etal[6]	Systematic Review	• There is strong and sufficient evidence to demonstrate the association between ventilation, air movements in buildings and the transmission/spread of infectious diseases such as SARS-CoV-1. • There is insufficient data to specify and quantify the minimum ventilation requirements in hospitals, schools, offices, homes and isolation rooms in relation to spread of infectious diseases via the airborne route
Azimi P, Stephens B[7]	Model	• Modified Wells-Riley model • Higher-efficiency HVAC filters may yield lower risks of influenza infection. • Applicable to dentistry? Wells-Riley model assumes a uniform spatial distribution of the infected cases in an enclosed space.

Summary

- Demonstrated technology is not practical for dentistry
- Off the shelf commercial products will not manage a single explosive event like a cough or sneeze
- Models are theoretical and cannot be applied to dentistry

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DENTAL CARE PROVISION WORLDWIDE

Some countries were better placed geographically to contain the virus, Australia and Canada for instance. The population density is so low in these countries that social distancing is enforced naturally. Interestingly, these countries allowed regions and provinces to decide how to manage dental provision specific to their region.

It cannot be disputed that lockdown and social distancing were an essential component of the UKs fight to halt the spread of SARS-CoV-2. Undoubtedly, cessation of routine dental care was pivotal in promoting social distancing and preservation of PPE. What could be raised as a discussion point would be the speed and efficiency of the UDCs and supply of PPE to these institutions. The consequence of these failings has been a vastly reduced emergency service to patients throughout the country, and without doubt in some cases this has led to a deterioration in their oral and general health.

Many countries took the stance from the outset, that dentistry is an essential service, there to prevent patients from overburdening secondary care. The UK did not take this stance, and instead adopted a recommendation for AAA approach only, in primary care. This has been flawed and vastly insufficient in many cases.

One theme that resonated through my research was a clear synergy between government health departments and dental associations/councils in many countries. The government set the strategy and allowed dentistry to self-govern its approach, resulting in clear directives from the outset. This information was then disseminated on a single portal. Take Australia for example- all protocols, patient information posters and financial aid packages were all accessible from the same webpage. This is not the case in the UK. Information is presented on multiple platforms with variable accessibility, adding to the confusion felt amongst practitioners. In the UK, the response to SARS-CoV-2 was varied between Wales, Scotland and England, leading to a period of confusion, delay and heightened transmission risk.

There has been much confusion within England specifically, about the roles of Public health England, the CDO, CQC, GDC and indemnity organisations. It is still an area of confusion regarding under what circumstances a practitioner may be able to provide face to face emergency patient management.

The mixed messages and statements have created a scenario where all dental practices have been forced to offer telephone triage only, resulting in patients being left vastly under-resourced for emergency care. This is now the time to consider specific, defined SOPs and requirements to allow dental practices, particularly those in the private sector, to introduce a phased re-opening, as has been the case in many countries around the world.

There is no evidence of SARS-CoV-2 transmission between dental professionals and patients. The most up to date study from Wuhan (Meng at al 2020) suggest no reported deaths from the provision of dental care to COVID-19 positive patients. Studies such as those conducted by Richards (2020) highlight the role of rubber dam in prevention of micro-organism spread, and consequently need serious consideration. This has been adopted by many countries as a reason to keep the profession providing a much-needed service. The UK has created a situation where dental practices have closed, without any scientific evidence supporting these decisions, risking patient health in the process. The financial impact of this is beyond the scope of this article; the reality is, however, dire for many practices nationwide. Many of these practices have the required PPE in place to provide a non-AGP emergency service from tomorrow, instantly easing the workload of UDCs and reducing the need for patients to travel. The financial impacts upon practices acting as a UDC have not gone unnoticed in the national press in recent days, as well as reports of inadequate PPE provision.

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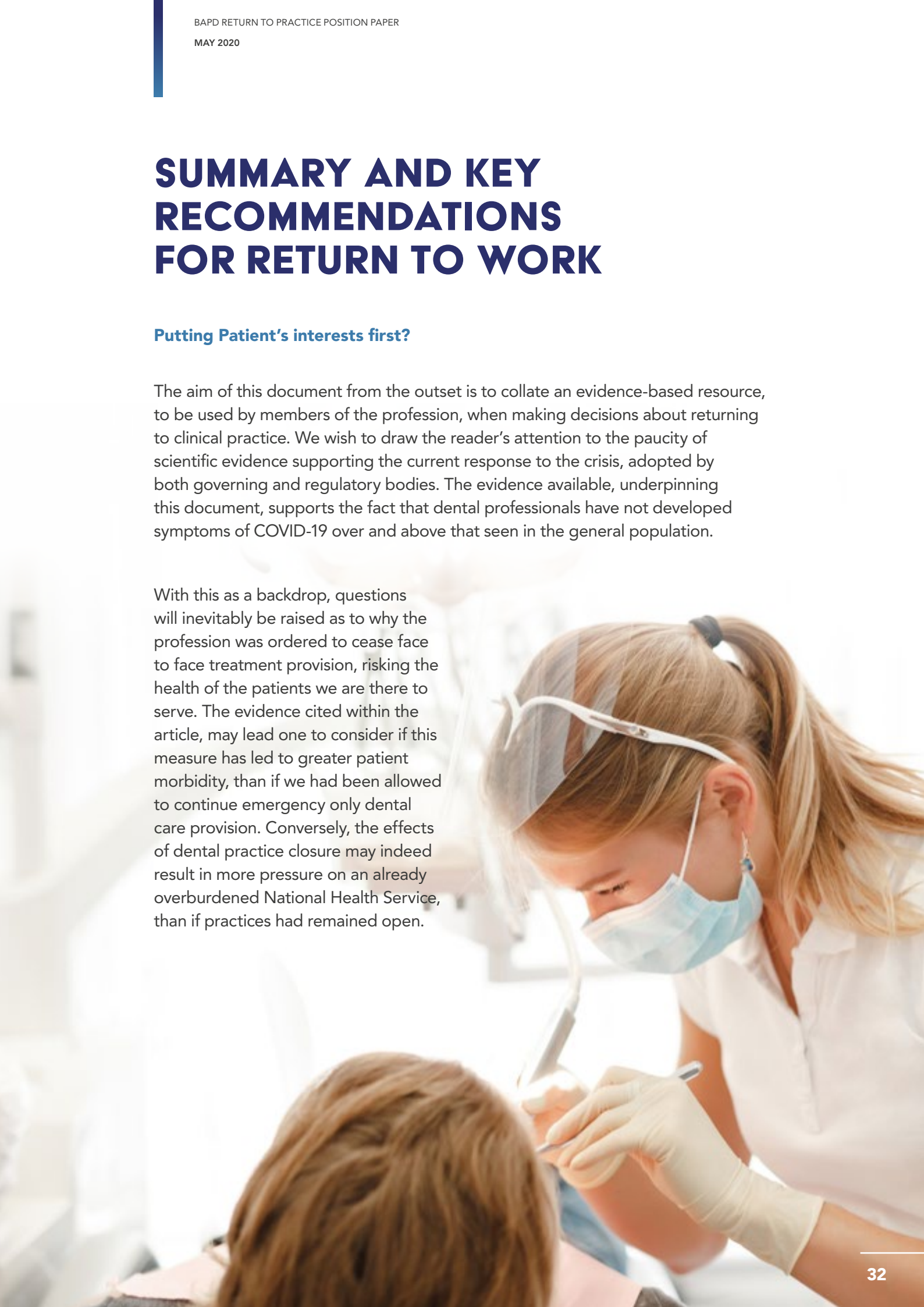
SUMMARY AND KEY RECOMMENDATIONS FOR RETURN TO WORK

Putting Patient's interests first?

The aim of this document from the outset is to collate an evidence-based resource, to be used by members of the profession, when making decisions about returning to clinical practice. We wish to draw the reader's attention to the paucity of scientific evidence supporting the current response to the crisis, adopted by both governing and regulatory bodies. The evidence available, underpinning this document, supports the fact that dental professionals have not developed symptoms of COVID-19 over and above that seen in the general population.

With this as a backdrop, questions will inevitably be raised as to why the profession was ordered to cease face to face treatment provision, risking the health of the patients we are there to serve. The evidence cited within the article, may lead one to consider if this measure has led to greater patient morbidity, than if we had been allowed to continue emergency only dental care provision. Conversely, the effects of dental practice closure may indeed result in more pressure on an already overburdened National Health Service, than if practices had remained open.



Scientifically, there is no evidence to suggest that dental aerosols are a primary vector for transmission. It is questionable then as to why certain PPE and equipment is being advised, distorting dental supply markets on a pricing and supply level and adding further unnecessary financial burden on dental practices.

Fiscally, the private dental sector, which accounts for over 50% of dental industry market value, has been left in limbo. The closure of practices has decimated balance sheets, leaving many in a precarious financial position and a doubtful future. This could realistically result in a situation of over-demand and under-supply, a retrograde step that risks oral health of the nation

Finally, although we cannot solely rely upon what other countries are doing to formalise our own response, we can use this as a guide. There seems to be a theme internationally that dentistry is recognised as an essential service and that dentistry is safe. It is a service that should and could have remained universally accessible throughout the crisis on an emergency basis.

Recommendations for the return to work?

We find ourselves at a critical juncture: we have to balance our desire to return to caring for our patients with making all the necessary arrangements to reassure our team, and our patients and the general public, that their safety is our highest priority. The seriousness of COVID-19 has been confounded by mixed messages in the dental profession which have left the public and our teams anxious, uncertain and confused. It is our hope that in the end the voice of scientifically backed reason will prevail.

Avoiding speculating on the 'how' and 'when' of the return to work, we have tried to answer the question that most dental professionals and team members want to know: "what do we have to do to keep our patients and ourselves safe?"

The recommendation of the BAPD at this time is:

- Look very carefully at what the science is saying and avoid being pressured into purchasing expensive equipment that has a poor evidence-base
- Ensure that you have sufficient stock of the PPE used pre-COVID-19,
- Start preparing your practice for social distancing and a minimal contact patient flow.

We have been paying close attention to both the current science in addition to what is happening in other countries and we are currently working with other organisations to produce a detailed, evidence-based SOP for return to work.