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# Paediatric dental pain and infection during the COVID period

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## ABSTRACT

**Background:** During the coronavirus pandemic, paediatric patients will still likely present with dental pain and infection.

In order to streamline care at King's College Hospital (KCH), Paediatric Dentistry and Oral and Maxillofacial Surgery (OMFS) have developed a collaborative working approach allowing patients to be treated effectively and to streamline patient care in the absence of easy access to general anaesthetic facilities.

**Method:** Presenting complaints, treatment need and the treatment received were recorded for all paediatric patients presenting with dental pain and infection in the “lockdown” period (23rd March- 14th June) during “normal” working hours and “out of hours” to either paediatric dentistry or OMFS.

**Results:** 420 calls were triaged which converted to 67 patients seen face-to-face for oro-facial pain and infection. 41% of children were treated successfully under Local anaesthetic alone, only 13% required a general anaesthetic (GA) in the “lockdown” period. The vast majority of patients had antibiotics prescribed prior to attendance (80%).

**Conclusion:** We have demonstrated the demographic, presenting complaints and treatment need of patients who presented to KCH during the lockdown period with dental pain and infection. The majority were able to be treated without needing for GA facilities. This paper highlights how a collaborative approach between paediatric dentistry and OMFS can help streamline patient care and is a model which can be adopted by other units in the event of further “lockdowns”.

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## Introduction

As the impact of the Coronavirus pandemic hit the United Kingdom (UK), forcing primary care dental practices to close<sup>1</sup> and the UK to go into “lockdown” on the 23rd March, many patients and practitioners faced a difficult predicament as dental pain and infection continued to occur.

Patients may still present in the current pandemic and require urgent dental treatment to avoid progression of dental decay to severe dento-facial infection. The most recent Child Oral Healthy survey of 5 year olds in 2019 highlighted how children in more deprived areas had a higher prevalence of dental caries (34.3%) than those from less deprived areas.

Those from “other ethnic groups” had a decay prevalence of 44.3%, almost double the national figure. Children in London are also more likely to suffer from dental caries compared to the national average.<sup>2</sup> Lambeth, where King's College Hospital is situated is 44th most deprived local authority in England. Three out of 5 patients describe their ethnicity as something other than white British and 1 in 3 families are in receipt of benefits.<sup>3</sup> Previous studies have highlighted that those from an ethnic background or living in deprived areas are less likely to have a positive dental attitude.<sup>4</sup> This group of patients are more likely to be irregular attenders and present only when in dental need and therefore will require access to emergency services.

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The UK has the 12th highest number of cases and 4th highest number of reported deaths globally from COVID-19.<sup>5</sup> This has complicated treatment as many secondary care facilities have been overwhelmed by coronavirus cases and have had to prioritise the most urgent areas of need, with staff members being redeployed.<sup>6</sup> This has led to a cessation in patients being seen for routine care, as well as different treatment modalities being required to treat acute emergencies.

To manage the ongoing dental need, King's College Hospital, having been selected as an urgent care provider for paediatric patients,<sup>7</sup> is running a phone triage service in order to maximise the number of patients who can seek care. This phone triage service is running 6 days a week during normal working hours. Out of hours patients can still present to the Oral and Maxillofacial service (OMFS) via the general paediatric emergency department.

The Oral and maxillofacial team and the paediatric dental team have created an integrated working pathway to effectively manage paediatric emergencies during this period. This has involved the oral and maxillofacial team managing acute dento-facial infection under general anaesthetic (GA) and the paediatric dental team triaging emergency dental cases which may have otherwise presented to accident and emergency. This has helped to reduce the burden on both services, especially with a lack of GA services and staff redeployment.

A service evaluation was completed prospectively on the paediatric dental emergencies presenting to King's College Hospital, both during normal working hours and out of hours, with pain, infection or swelling of a dental aetiology. Our aim was to determine the prevalence of dental facial infection in the paediatric population during the COVID-19 pandemic that was not able to be managed by the patient's General Dental Practitioner (GDP). A data collection sheet was designed to record the presenting signs and symptoms, the treatment required, how treatment was performed (Local anaesthetic (LA), Inhalation sedation (IHS), GA) as well as prior antibiotic use.

## Method

The aim of this service evaluation was to assess how many patients with dental pain and infection:

- Attended face-to-face appointments
- Required treatment
- What treatment was received.

This was registered with the trust audit team.

Data was collected prospectively from the beginning of "lockdown" (23rd March 2020) to the easing of lockdown restrictions (14th June 2020). During this time period, any child patient presenting to King's College Hospital with pain or infection of a dental origin was recorded.

Patients were identified from their clinical notes in the dental institute if presenting in normal "9–5" working hours to the paediatric dental team. Those presenting "out of hours" to the oral and maxillofacial team were identified using "Symphony", the emergency department electronic database. All patients presenting during normal working hours had

been phone triaged by a member of the paediatric dental team, which patients accessed through calling the NHS 111 service. Those who met the locally agreed acceptance criteria of: orofacial swelling, pain not amenable to be managed by their GDP with analgesia ± antibiotics or medically compromised children with pain, were accepted for urgent treatment. These are all cases unable to be managed by GDP's or urgent care dental hubs.

Data was recorded prospectively using a data collection sheet to highlight the ages of patients attending, their main complaint and clinical diagnosis, treatment which was completed and previous antibiotic use.

Patients who presented with dental trauma were excluded as this was analysed in a separate service evaluation.

## Analysis

Data was analysed for descriptive statistics using Microsoft Excel (2020).

## Results

### Presentation and demographics

Over the "lockdown" period over 420 phone calls were triaged for paediatric dental emergencies. This converted to 171 (40%) face-to-face appointments of which 67 patients presented with pain and infection of a dental aetiology during this period, the remaining 104 attended with dento-alveolar trauma. A number of patients (305) were managed with advice over the telephone and did not require face to face appointments (Fig. 1). One patient was seen both in the emergency department and the paediatric dental clinic as they required intra-venous antibiotics for dento-facial infection prior to extirpation of a maxillary central incisor. Five patients (7.5%) were seen "out of hours" in the Paediatric emergency department with most patients (92.5%) (n = 62) seen on the paediatric dental clinic.

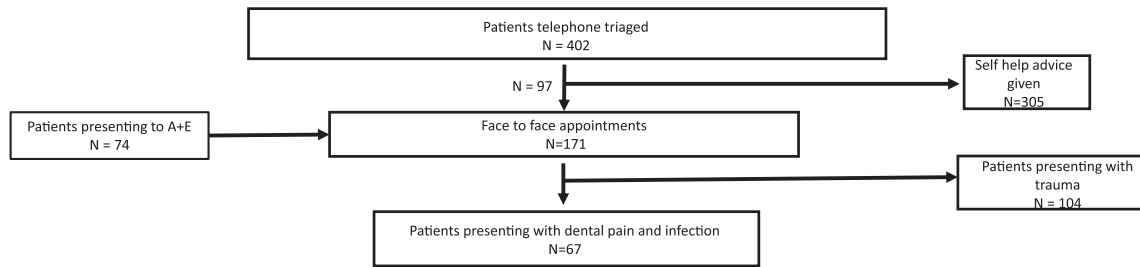
The demographics included 27 female patients and 40 male patients. The females presented with an average age of 8.2 (range from 3 to 16 years old). The males had an average age of 6.95 (range from 3 to 12 years old).

### Medical history

In terms of past medical history, the majority of patients (61.2%) were fit and well (n = 41). Other common presentations included: autistic spectrum disorders (13.4%) (n = 9), epilepsy (8.9%) (n = 6), asthma (5.9%) (n = 4) and a history of cardiac disease (2.9%) (n = 2).

### Presenting complaints

The majority of patients presented with "pain" from at least one tooth (42.2%) (n = 31), with the remainder presenting with gingival swelling adjacent to a tooth (37.3%) (n = 25) and facial swelling (14.9%) (n = 10). One patient who was triaged by a non-paediatric dentist presented with mobile exfoliating primary teeth.



**Fig. 1 – Number of patients presenting.**

**Diagnostic tests**

Forty patients (59.7%) had an OPG radiograph exposed. Twelve patients (17.9%) had lateral oblique radiographs taken, with four patients having anterior views (either upper standard occlusal or periapicals). The remaining ten patients had no diagnostic tests, either due to a lack of compliance, or an obvious unrestorable primary tooth.

**Clinical diagnosis**

The majority of patients (52.2%) (n = 35) were diagnosed with an intra-oral abscess from at least one tooth. Twenty-two patients (32.8%) were diagnosed with irreversible pulpitis, six patients (8.9%) with facial swellings and two (2.9%) with reversible pulpitis.

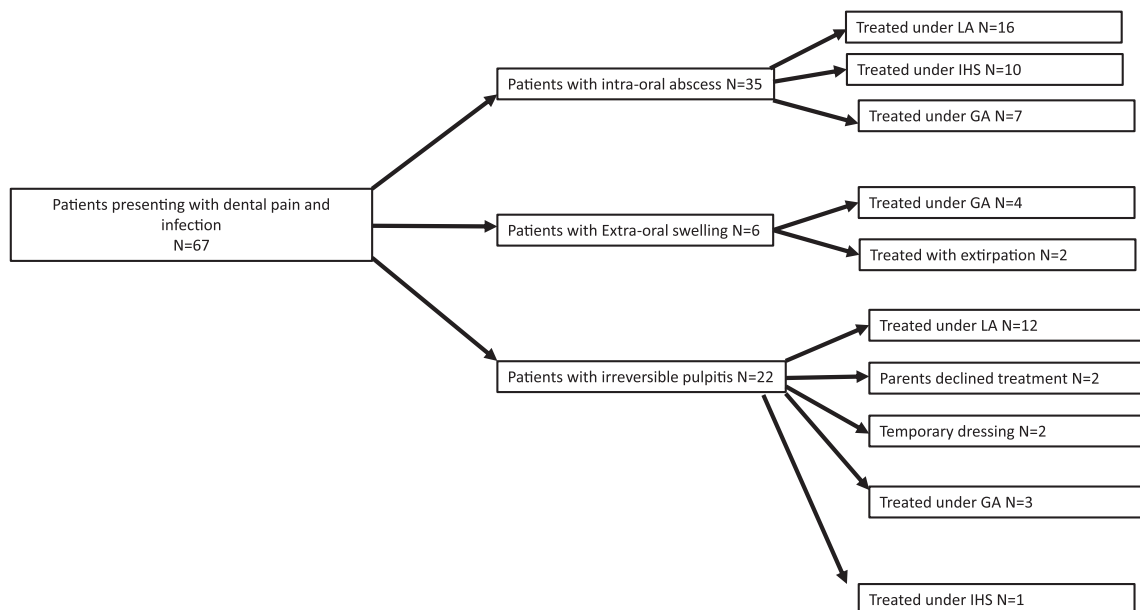
Fifty patients (74.6%) dental complaints were associated with at least one primary tooth, 16 (23.8%) had pain from the permanent dentition, mainly from permanent molars (n = 12 (17.9%)) with the remainder from previously traumatised incisors (5.9%) (n = 4). One patient was diagnosed with pain from both a primary and permanent molar.

**Treatment**

The majority of the children (41.7%) (n = 28) were treated under local anaesthetic (LA) alone. Eleven patients (16.4%) required inhalation sedation (IHS) and local anaesthetic. Over half of children presenting (64.2%) (n = 43) received dental treatment on the same day as presenting to the clinic (Fig. 2).

Fourteen children (20.8%) required GA for treatment. Nine patients (13.4%) received a GA in the “lockdown” period. Five of these patients were autistic, two required emergency incision and drainage due to spreading dento-facial infection, and the majority of the remaining patients were below the age of five.

Two patients had dressings placed without local anaesthetic. Seven patients received no treatment. Of these, three patients were non compliant and prescribed antibiotics and two parents declined treatment. Two patients did not fit the criteria for paediatric dental emergencies in the COVID period, both were assessed by non-paediatric dentists. Of these; one patient was complaining of exfoliating primary teeth, which was deemed none urgent, and one was complaining of bleeding gingivae.



**Fig. 2 – The Main patient presenting complaints and treatment.**

### Antibiotic use

The overwhelming majority of patients (80.5%) (n = 54) had already had at least one course of antibiotics upon presentation, either from their GDP, General Medical Practitioner or another secondary care site. Only thirteen patients (19.4%) had not been prescribed any antibiotics prior to attendance (Fig. 3).

### Discussion

This service evaluation highlights the patient attendance during the “lockdown” period to paediatric dentistry and OMFS. A total of 171 patients were seen, of which 67 presented with dental pain, infection and swelling. Of these (92.5%) presented to paediatric dentistry through the NHS 111 service during “normal” working hours. Only five presented “out of hours”. This is a trend which is visible throughout the UK, with many paediatric emergency departments reporting that attendance throughout the COVID-19 pandemic is significantly lower when compared to the usual levels (Isba, Edge et al., 2020). This could be due to parental anxiety in attending face-to-face appointments without first seeking telephone advice (as has been advised by NHS England). Parents may have also been heeding the government advice of “stay at home, protect the NHS, save lives”. Furthermore, 2.2million people were classed as “extremely vulnerable” by the NHS and advised to “shield” (Foster June 2020). This may have further contributed to patients being less willing to attend out of hours appointment.

### Antibiotic usage

The cessation of all routine dental appointments in England as lockdown began has likely contributed to the antibiotic prescribing observed in our patient group. Primary care clinicians were instructed to adhere to “Advice, Analgesia and Antibiotics” in the absence of definitive treatment.<sup>1</sup> The vast majority of patients (80%) (n = 54) had already had at least one course of antibiotics from a healthcare provider. This is much higher than has been previously reported in the literature where 40% of patients had received antibiotics prior to hospital attendance.<sup>8</sup> This highlights the emergency nature of the patients attending during this period.

The majority of patients were managed for a significant time period with antibiotic therapy. This helped to ensure that the NHS was not overwhelmed with patients at a crucial time during the peak of the pandemic, allowing most patients to manage for the short-term. These patients are now beginning to attend appointments as “lockdown” eases and the majority are presenting with infections which can no longer be managed with systemic measures alone. This is likely to be the case as primary care providers begin to restart services; they are likely to be faced with a greater number of children requiring treatment of infected teeth. The ongoing challenges facing secondary care providers include a likely increase in the number of children presenting once “lockdown” is eased with antimicrobials no longer being effective at delaying symptoms. This may see secondary care resources stretched even further.

Further to this, the impact of increased prescribing during COVID-19 may lead to an increase in antimicrobial resistance.<sup>9</sup> This may lead to further difficulties for both primary and secondary care providers in the future, especially when treating a challenging group of patients who may be anxious and not always amenable for treatment under LA only.

This change in antibiotic prescribing has been highlighted in different Scottish Dental Clinical Effectiveness Programme (SDCEP) guidelines pre<sup>10</sup> and during<sup>11</sup> the COVID-19 pandemic, whereby it may no longer be appropriate to conduct local measures in the first instance.

### Treatment

Treatment was mainly completed under LA alone (41.7%) (n = 28), and inhalational sedation (16.4%) (n = 11). This was driven by a lack of access to GA facilities throughout the pandemic, as elective operating lists were cancelled and resources diverted elsewhere.<sup>12</sup> This is a decrease from nearly 30 regular general anaesthetic slots for the paediatric dental department a week to “ad hoc” emergency general anaesthetic lists. GA lists have been increasing year on year, with one busy London hospital completing over 760 paediatric dental GAs a year.<sup>13</sup> Given this lack of access to GA and the urgent nature of patients attending for treatment during the current pandemic it is likely that many of the parents, children and clinicians were more willing to attempt treatment under LA and IHS than would normally be the case. Parents were also more likely to be aware of a lack of access to GA facilities and understanding of this current limitation.

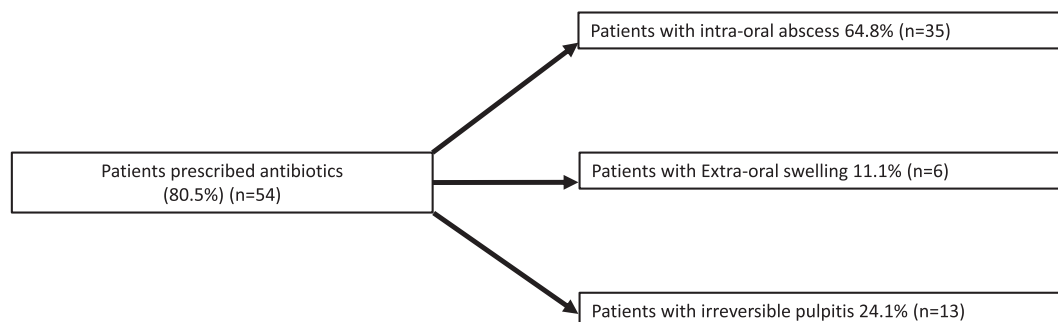


Fig. 3 – Number of patients previously prescribed antibiotics.

Paediatric dental general anaesthetics have increased 18 per cent in the past six years, with over 180 operations performed a day on children, every year. This is a bill of our £205million per annum for the NHS.<sup>14</sup> There are currently over 700 paediatric patients awaiting a dental GA at KCH alone. Inevitably the nationwide back-log of patients awaiting general anaesthetic<sup>15</sup> may mean that the profession, parents and children alike have to adapt to having treatment completed under different treatment modalities, and general anaesthetic treatment is reserved for those in the most vulnerable groups. In the medium term whilst the healthcare system is continuing to recover from the current “wave”, different centres may have to adapt to treatment under different treatment modalities, as we have demonstrated in our treatment of children in the current pandemic.

### **Multi-disciplinary team working and consideration to future waves**

With respect to dental pain and infection alone, two patients required immediate referral from the paediatric dental department to the Oral and Maxillofacial team for acute management of spreading dento-facial infection. Other patients have been triaged by the oral and maxillofacial team and advised to attend the paediatric dental department for treatment in normal hours. This multi-disciplinary team management of acute cases has allowed for the most urgent cases to be treated in the most effective manner.

There are 18 dental schools in the UK which have dedicated paediatric dental departments. The majority of these units have oral and maxillofacial teams with inpatient facilities. We have demonstrated an effective collaborative working approach. Paediatric dental emergencies who presented in hours to accident and emergency were triaged by the paediatric dental team and those out of hours were stabilized by OMFS and scheduled dedicated appointments in paediatric dentistry in normal hours. Those with spreading dento-facial infection were managed acutely by the OMFS team. This approach has helped to reduce the burden on the NHS and both working teams. Further to this, the OMFS team have arranged urgent paediatric dental general anaesthetics at a time when capacity for day surgery has been reduced. Those who may have normally had treatment under general anaesthetic have been treated successfully under inhalation sedation. In the event of a likely second peak, this collaborative approach can be considered for all paediatric dental departments twinned with oral and maxillofacial units.

There is a large area of the population which is not served by dental schools. In these areas many urgent dental care centres opened up. A total of 627 opened across the UK.<sup>16</sup> In preparation for further waves of coronavirus it is important to consider further collaborative working. Urgent dental hubs could give consideration to collaborate with paediatric dentists/those with special interest in paediatric dentistry to help ease the burden on secondary care and limited general anaesthetic lists. The provision of inhalation sedation, as we have demonstrated, may help with this.

### **Clinical holding**

The British society of Disability and Oral health has previously released guidelines pertaining to the use of clinical holding in dentistry in 2009.<sup>17</sup> Given the young demographic of patients presenting to the department, a lack of access to GA facilities and the emergency nature of treatment, appropriate clinical holding/“parental restraint” had to be implemented for several patients. Consent has been explicitly sought for this beforehand and treatment only completed in this manner if parents agreed.

### **Safeguarding**

Finally, it is worth considering safeguarding of patients in this current pandemic. Whilst there may inevitably be a delay in patients presenting; clinicians should still be mindful of dental neglect and the need to safeguard children. One previous study has highlighted that 40% of children with dento-facial infection admitted for acute management were known to social services.<sup>18</sup> The NSPCC has highlighted how calls regarding domestic abuse have increased by 32% following the start of “lockdown”.<sup>19</sup> Children are in a vulnerable position and a lengthy delay in presentation without justifiable reason may be a cause for concern.

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### **Conclusion**

We have highlighted the number, demographic and treatment need of the 67 patients who presented to King’s College Hospital during the lockdown period with dental pain, infection and swelling.

The overwhelming majority (80%) of these patients had had a prior course of antibiotics during “lockdown”. This highlights the nature of dental management being carried out and shows how the majority of patients were managed at the very least for a period with antibiotics during COVID-19. This is not normal dental management of acute dental pain and infection.

Due to a lack of GA facilities our service had to be adapted to continue to manage this group of paediatric patients effectively. The majority of children were treated under LA and IHS (57%). This is unusually high compared to our non-Covid workload. Some patients, mainly with a pre-existing medical need, still require access to GA facilities. This data can be used to highlight how services may change in order to adapt to local situations during a pandemic. We have demonstrated how an enhanced collaborative working approach between paediatric dentistry and OMFS, purely to manage acute dental pain and orofacial infection can help to streamline patient care during a national “lockdown”. This is a useful collaboration in the event of likely further virus waves and “lockdowns”.

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