

# Using telehealth for oral medicine patient management during the COVID-19 lockdown

Ajith Polonowita<sup>1</sup> | Guangzhao Guan<sup>1</sup> | W. Murray Thomson<sup>2</sup> | Reuben Martin-Hendrie<sup>3</sup>

<sup>1</sup>Department of Oral Diagnostic and Surgical Sciences, Faculty of Dentistry, University of Otago, Dunedin, New Zealand

<sup>2</sup>Department of Oral Sciences, Faculty of Dentistry, University of Otago, Dunedin, New Zealand

<sup>3</sup>Dental and Oral Health Services, Capital and Coast District Health Board, Wellington, New Zealand

## Correspondence

Ajith Polonowita, Department of Oral Diagnostic and Surgical Sciences, Faculty of Dentistry, University of Otago, 310 Great King Street, Dunedin, 9016, New Zealand.  
Email: [ajithpolonowita@gmail.com](mailto:ajithpolonowita@gmail.com)

## Abstract

**Aim:** To investigate patient and clinician feedback on remote telehealth consultations to determine their feasibility for use as an adjunct service.

**Methods:** A cross-sectional investigation of satisfaction with telehealth consultations. In total, one oral medicine specialist, four dentists and 88 patients were surveyed.

**Results:** A total of 88 video consultations were completed with patients in Christchurch and Wellington hospitals. There was always a dentist present with the patient during the consultation. Overall, 95.5% of patients found the experience to be comfortable, with no systematic differences by sex, age, ethnicity or reason for the visit. Most patients were satisfied with the treatment received during the video consultations. Fewer patients who presented with pain were satisfied with the treatment received than were those who presented with oral mucosal disorders or other issues (61.8%, 75.0% and 76.9%, respectively). Both the oral medicine specialist and clinicians involved found the process comfortable and did not find diagnostic capabilities to be compromised.

**Conclusion:** Video telehealth might be a valid alternative or adjunct to face-to-face consultations. This may open the way for remote video consultations to improve the availability of oral medicine services in rural areas.

## KEYWORDS

telehealth, oral medicine, video consultation

## 1 | INTRODUCTION

Telehealth can provide an adjunct to services and potentially increase their availability in regions where such services are not available. The novel coronavirus disease 2019 (COVID-19) and the associated national lockdowns gave an opportunity to explore the feasibility of telehealth as an adjunct service. COVID-19 caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) became a global pandemic threat, as reported by the World Health Organization (WHO), on 31 December 2019.<sup>1</sup> Generally, coronaviruses are common in animals such as cattle,

camels and bats, with some affecting humans and causing mild respiratory illness. However, coronaviruses such as severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle-East respiratory syndrome coronavirus (MERS-CoV) have caused outbreaks in the past two decades. The symptoms of SARS-CoV-2 infection can range from dry cough, breathing difficulty, fever and fatigue to severe pneumonia and cardiorespiratory failure.<sup>2</sup> Although the route of COVID-19 transmission is not yet fully understood, the rate of transmission is very high,<sup>3</sup> with its reproductive number higher than that of the SARS coronavirus.<sup>4</sup> As a result, several countries (including New Zealand) have

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implemented the world's largest and most restrictive mass quarantines.

Dental and oral and maxillofacial surgery procedures using drills or ultrasonic devices can cause aerosol release, and so non-essential dental care was suspended in most countries.<sup>5,6</sup> However, urgent dental care and advice were still being delivered by emergency or on-call dental teams, mainly by telephone.

Oral medicine specialists generally manage chronic oral mucosal diseases and orofacial pain. Oral medicine also involves the diagnosis and management of oral potentially malignant disorders (OPMD). These may present as ulcers, white, red or mixed patches of the oral mucosa or swellings. The prognosis for the patient can be improved by an earlier diagnosis, but a delay may lead to a poorer prognosis.<sup>7</sup> Given that most patients are managed non-surgically, treatment does not routinely involve aerosol-generating procedures and could be considered low risk for transmission of infection.<sup>8</sup> Fundamental aspects of breaking the chain of infection in dental practice are patient screening (via questionnaires), hand hygiene, correct use of the personal protective equipment, mouth rinses before dental procedures, rubber dam isolation, anti-retraction handpiece, disinfection of clinical settings and correctly managing medical waste.<sup>5,6</sup> The nature of clinical oral medicine practice makes it more amenable to video consultations.

Telehealth can involve telephone conversation between patients and clinicians, a video consultation between patients and clinicians or a video consultation between patients and clinicians in one clinic and other clinicians in another location. Video conferencing has been considered to be a useful and efficient modality for care when the in-person discussion is not possible because of geographic and schedule constraints, and it has been shown to be feasible and effective in chronic disease management.<sup>9-11</sup> There are many types of video conferencing software in the market, with Zoom (Zoom Video Communications, Inc.) as an example. It is supplied by an American remote conferencing services company headquartered in San Jose (California), providing a remote conferencing service that combines video conferencing, online meetings, chat and mobile collaboration. Its use has greatly increased due to the COVID-19 pandemic as teaching and meetings have shifted to online platforms. Zoom has also been used in many healthcare settings, including multidisciplinary hospital meetings and mental health.<sup>9,11</sup> COVID lockdowns gave an opportunity to investigate the use of telehealth as an adjunct to face-to-face consultations.

The aim of this study was to investigate patient and clinician responses to telehealth consultation to determine its feasibility for remotely delivering healthcare.

## 2 | METHODS

The study was approved by the Human Research Ethics Committee of the University of Otago, New Zealand

### Clinical relevance

#### Scientific rationale for the study

Oral Medicine services are not available in remote centres in New Zealand. This became more apparent during the recent COVID-19 lockdowns. The lockdowns provided a good opportunity to investigate the use of telehealth in the oral medicine setting.

#### Principal finding

This study showed that the telehealth patient consultations with a specialist being remote from the patient provided an accurate and valid service to patients.

#### Practical implications

This form of consultation for patients can enhance and improve the services for areas lacking such a service. It provides an adjunct to the services already available.

(D20/196). It involved a survey of patients by oral medicine specialists and dentists. A formal sample size calculation was not possible because of the lack of similar data, and so we undertook to collect data from all consultations conducted on patients ( $N = 88$ ) who presented during the lockdown. Zoom video conferencing was used with the clinician in a secure location remote from the patient. There was always a dentist present with the patient during the consultation. The Zoom consultations were carried out using a laptop computer (Dell Latitude E7450, 14") at each end.

Patient hospital record systems allowed secure access to hospital records via remote login, so record-keeping was secure and records were available only during the consultation. Patient-clinician communication was via the video conferencing application Zoom, with password access for security. The patient and a qualified dentist were in a hospital clinic remote from the oral medicine specialist (because the specialist was in another city). All communication was conducted in a secure and confidential manner. A standard proforma was used for oral medicine consultations, and physical examinations were carried out by the clinician who was with the patient. For temporomandibular disorder (TMD) cases, the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) criteria were used. For mucosal disorders, photographs were taken as required. At the start of the consultation, the patient was correctly identified, the consultation process was explained verbally, and consent was again obtained from the patient. Prior to the consultation, the patient completed a medical history questionnaire (including COVID-19 screening questions) and read (and signed) a telehealth consent form. After the consultation, the patient was asked to complete an evaluation form, with 18 questions to

be **rated** (Appendix 1). The questionnaires were developed by the authors. These forms were scanned into the patient file. The oral medicine specialist (lead author) and the dentist also completed an evaluation **form** (Appendix 2). The data were collected over a 2-month period and entered into an Excel file. Apart from the oral medicine specialist, the dentists present with the patient during video conferencing appointments were all recent graduates with between 6 months and 2 years of experience.

## 2.1 | Data analysis

Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 23 (SPSS Inc.). The questions on various aspects of the consultation experience each used five ordinal response categories, with anchors at each end. For the question ‘How convenient was the encounter?’ for example, the response ‘Not convenient’ scored 1, while the ‘Very convenient’ response scored 5. At the analysis stage, all such responses were dichotomised so that the two highest ones were scored 1 and the remainder scored 0. After the computation of descriptive statistics, cross-tabulations and chi-squared tests were used to examine the statistical significance ( $p < 0.05$ ) of differences observed amongst groups.

## 3 | RESULTS

All the 88 patients who were seen took part in the study. Almost two-thirds were females, and those of European ethnicity predominated (Table 1). Over one-third of patients had attended due to pain, with mucosal disorders being second

most common. Just over half attended for new patient consultation, with the remainder being review appointments. Most patients were in the 50–69 years age group.

Almost all patients found the experience to be comfortable, with no systematic differences by sex, age, ethnicity or reason for visit (Table 2). Most found the service convenient, and over three-quarters found the process understandable given the current circumstances. More than two-thirds were very satisfied overall with the treatment and advice received during video consultations. Fewer patients who had presented with pain were satisfied with the treatment received than those who had presented with oral mucosal disorders or other issues.

This difference in satisfaction with the treatment received was also reflected in patients’ satisfaction with the process of the video consultations, with fewer satisfied patients amongst those who presented due to pain than those who presented due to oral mucosal disorders and other issues (Table 3). There was high satisfaction with the visual image and sound quality.

All dentists (four) indicated (in the interviews) that telehealth appointments were a valid alternative to face-to-face visits given the situation and would happily undergo this process again. While they initially found the process of examining patients and communicating with the oral medicine specialist very challenging, they became more comfortable once the system had been streamlined. For example, one junior dentist commented: ‘I didn’t feel that my oral medicine knowledge was great, but with the telehealth process I felt the knowledge was supported’.

The patients initially seen by telehealth were subsequently reviewed face to face by the specialist. There were no changes made to the diagnoses or management at review.

**TABLE 1** Diagnosis by demographic characteristics and appointment type (brackets contain row percentages unless otherwise indicated)

	Orofacial pain, <i>n</i> (%)	Mucosal, <i>n</i> (%)	Other, <i>n</i> (%)	Total, <i>n</i> (%)
Gender				
Male	10 (38.5)	8 (30.8)	8 (30.8)	26 (29.9)
Female	24 (38.7)	20 (32.3)	18 (29.0)	62 (70.1)
Age group				
<30	9 (69.2)	0 (0.0)	4 (30.8)*	12 (13.6)
30–49	12 (60.0)	4 (20.0)	4 (20.0)	20 (22.7)
50–69	9 (23.7)	17 (44.7)	12 (31.6)	38 (43.2)
70+	4 (23.5)	7 (41.2)	6 (35.3)	17 (19.3)
Ethnicity				
Pakeha	13 (50.0)	8 (30.8)	5 (19.2)	26 (29.5)
Other	21 (33.9)	20 (32.3)	21 (33.9)	62 (70.5)
Appointment				
Consultation	20 (40.8)	17 (34.7)	12 (24.5)	49 (55.7)
Review	14 (35.9)	11 (28.2)	14 (35.9)	38 (44.3)
All combined	34 (38.6)	28 (31.8)	26 (29.5)	88 (100.0)

\* $p < 0.05$ .

**TABLE 2** Patients' opinions on the telehealth service, by demographic characteristics, diagnosis and appointment type (brackets contain row percentages unless otherwise indicated)

	Comfortable, <i>n</i> (%)	Convenient, <i>n</i> (%)	Understandable, <i>n</i> (%)
Gender			
Male	24 (92.3)	22 (84.6)	21 (80.8)
Female	60 (96.8)	55 (88.7)	48 (77.4)
Age group			
<30	11 (84.6)*	9 (69.2)	7 (53.8)
30–49	20 (100.0)	18 (90.0)	17 (85.0)
50–69	38 (100.0)	36 (94.7)	33 (86.8)
70+	15 (88.2)	14 (82.4)	12 (70.6)
Ethnicity			
Pakeha	25 (96.2)	22 (84.6)	19 (73.1)
Other	59 (95.2)	55 (88.7)	50 (80.6)
Appointment			
Consultation	46 (93.9)	42 (85.7)	34 (69.4)*
Review	38 (97.4)	35 (89.7)	35 (89.7)
Diagnosis type			
Pain	32 (94.1)	30 (88.2)	26 (76.5)
Mucosal	27 (96.4)	25 (89.3)	21 (75.0)
Other	25 (96.2)	22 (84.6)	22 (84.6)
All combined	84 (95.5)	77 (87.5)	69 (78.4)

\**p* < 0.05.**TABLE 3** Patients' satisfaction with care aspects, by demographic characteristics, appointment type and diagnosis type (brackets contain row percentages unless otherwise indicated)

	Very satisfied with		Satisfied with	
	Treatment, <i>n</i> (%)	Process, <i>n</i> (%)	Visual image, <i>n</i> (%)	Sound, <i>n</i> (%)
Sex				
Male	17 (65.4)	16 (61.5)	22 (84.6)	24 (92.3)
Female	45 (72.6)	42 (67.7)	58 (93.5)	55 (88.7)
Age group				
<30	10 (76.9)	9 (69.2)	10 (76.9)	11 (84.6)
30–49	12 (60.0)	13 (65.0)	19 (95.0)	18 (90.0)
50–69	28 (73.7)	24 (63.2)	36 (94.7)	35 (92.1)
70+	12 (70.6)	12 (70.6)	15 (88.2)	15 (88.2)
Ethnicity				
Pakeha	20 (76.9)	16 (61.5)	24 (92.3)	25 (96.2)
Other	42 (67.7)	42 (67.7)	56 (90.3)	54 (87.1)
Appointment				
Consultation	34 (69.4)	32 (65.3)	46 (93.9)	44 (89.8)
Review	28 (71.8)	26 (66.7)	34 (87.2)	35 (89.7)
Diagnosis type				
Pain	21 (61.8)	20 (58.8)	32 (94.1)	31 (91.2)
Mucosal	21 (75.0)	20 (71.4)	25 (89.3)	26 (92.9)
Other	20 (76.9)	18 (69.2)	23 (88.5)	22 (84.6)
All combined	62 (70.5)	58 (65.9)	80 (90.9)	79 (89.8)

## 4 | DISCUSSION

This study set out to determine the acceptability of telehealth consultations to patients and clinicians. Most patients found the video conferencing process comfortable, and both the oral medicine specialists and the dentists indicated that it was a comfortable and feasible alternative to face-to-face consultations. In terms of the diagnostic and maintenance aspect of patient management, the telehealth process rated well and provided a valid alternative to face-to-face contact during the COVID-19 pandemic. Although we do not advocate that the telehealth approach replaces traditional face-to-face consultation, we have shown that the former does have a place, since oral medicine manages mainly chronic disease cases, requiring repeated, regular reviews and follow-ups. With the benefit of hindsight, we know now that the telehealth diagnoses were concordant with those obtained in subsequent face-to-face consultations. This did not form part of the study but that concordance helped to reassure the consultant that this process produced diagnoses that were the same as those that would have been made face to face. This indicates that the study goals were met, although direct and systematic comparison of face-to-face and telehealth diagnoses would be a separate study.

The global COVID-19 pandemic was an unprecedented event, and there were minimal preparations in place to continue oral medical care. To our knowledge, this study was the first of its kind to investigate the use of telehealth during a viral pandemic as it relates to oral medicine. While this represents a strength of the study, it is also a weakness because there are no other papers available for comparison. While patient numbers were relatively high, the number of participating clinicians was low, with only one oral medicine specialist and four dental clinicians involved in the study. More compelling clinician data would have been obtained had there been more involved, but this was not possible, and so the main value of this study lies in the information from patients. The information from clinicians should be considered to be pilot data only.

From the perspective of the clinicians, the telehealth process met their expectations of being able to provide support for examination and facilitating special tests, and they were able to manage the patient without feeling out of their depth. They indicated that telehealth appointments were a valid alternative to face-to-face visits given the situation and would happily use this process again. While they initially found the process of examining patients and communicating with the specialist very challenging, they became more comfortable once the system was streamlined. In addition, the oral medicine specialist was comfortable with the telehealth process and felt that it met his needs in caring for his patients. The dentists involved with examining the patient and relaying information to the oral medicine specialist agreed that the service was feasible and a valid alternative to face-to-face visits.

A recent publication on the management of oral medicine emergencies during COVID-19 is also a useful guide for the general dentist to use as an adjunct to the telehealth process.<sup>12</sup> These initial guidelines are likely to evolve further as more

information and data come to hand. During the COVID lockdown, the most common oral medicine presentations have been for chronic facial pain, such as that arising from temporomandibular joint disorder, and for exacerbations of vesiculobullous lesions, but there were other presentations.

The study findings should help streamline the telehealth process and plan for future quarantine periods due to recurrent outbreaks of the COVID-19 virus, such as those which have occurred more. However, in some countries, there are few oral medicine services, and the service is not available to large parts of the countries without patients having to travel substantial distances. As such, this study may help to develop a telehealth referral and examination system for remote rural areas to extend the service to populations whose oral medicine needs have not been met. A useful area of future research would be to examine the feasibility and acceptability of such a system.

## CONCLUSION

During the lockdown period of a pandemic, video conferencing is a useful platform that could be used in patient triaging, managing non-surgical emergencies, providing reassurance, and allowing remote follow-up of patients. Oral medicine emergencies can be carefully evaluated and triaged via video conferencing and sometimes phone contact, to avoid and minimise the risk of infection from COVID-19. However, it is important that both the patient and clinician understand that the telehealth process has limitations but that telehealth provides a valid adjunct to face-to-face consultations. The telehealth consultations in this evaluation were found to be effective, affordable, acceptable to patients and clinicians, and they enabled a degree of continuity in the service provided.

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## CONFLICT OF INTEREST

The authors declare that they have no competing interests.

## AUTHOR CONTRIBUTIONS

The author(s) read and approved the final manuscript.

## DATA AVAILABILITY STATEMENT

The data sets used and/or analysed during the current study are available from the corresponding author on reasonable request.

## ORCID

Ajith Polonowita  <https://orcid.org/0000-0002-2578-1929>

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## APPENDIX 1

### The study questionnaire

#### Evaluation of patient and doctor perceptions of the use of telemedicine

**Participant name:** \_\_\_\_\_

**Age:** \_\_\_\_\_

**Gender:** ( ) Male

( ) Female

( ) Other

**Ethnicity:** ( 1 ) New Zealand European

( 2 ) New Zealand Maori

( 3 ) Pacific Islander

( 4 ) Asian

( 5 ) Other: \_\_\_\_\_

**Office use only**

Appointment:

Baseline

Review

## Telehealth Patient Satisfaction Survey

1. How has this Pandemic affected your anxiety about the time it would take to be seen?

**Very  
anxious= 1**

**Not  
worried=5**



2. How did the offer of a Telehealth appointment allay those fears?

**Not at all**

**Very much**



3. How comfortable did you feel?

**Not  
comfortable**

**Very  
comfortable**



4. The use of telehealth is worth my time

**Never**

**Sometimes**

**Always**



**Seldom**

**Often**

5. How convenient was the encounter?

**Not  
convenient**

**Very  
convenient**



6. Was the lack of physical contact acceptable?

**Not  
acceptable**

**Very  
acceptable**



7. I prefer the use of telehealth over a face to face visits



8. Please rate the quality of the visual image



9. Please rate quality of audio sound



10. Concerns about privacy?



11. Were you reassured about confidentiality of the Telehealth appointment?



12. Are you satisfied with the treatment given through telehealth?



13. At the end of the appointment how satisfied were you about the process?



14. At the end of the appointment, were you reassured about your presenting problem?



15. How was your Telehealth appointment experience compared to seeing your specialist in person?



16. How did you find any difficulty in understanding the process of telehealth?



17. Did you find telehealth service feasible?



18. Did you find telehealth service convenient?



19. Would you do it again? Yes/No

20. Have you ever been involved in a telehealth consultation before? Yes/No

21. Would you participate in another telehealth consult in future? Yes/No

22. Additional Comments? \_\_\_\_\_

## APPENDIX 2

## Practitioner satisfaction survey

## Evaluation of patient and doctor perception toward the use of telemedicine

**Participant name:** \_\_\_\_\_

**Age:** \_\_\_\_\_

**Gender:** ( ) Male

( ) Female

( ) Other

**Years of experience:** \_\_\_\_\_

**Ethnicity:** ( ) New Zealand European

( ) New Zealand Maori

( ) Pacific Islander

( ) Asian

( ) Other: \_\_\_\_\_

**Office use only**

Appointment:

 Baseline Review

### Telehealth Practitioner Satisfaction Survey

1. Did the ability to use telehealth with your patient meet your expectations?



2. Were you able to examine the patient adequately to meet your needs of the visit?



3. Please rate the quality of the visual image



4. Please rate quality of audio sound



5. Did you find telehealth service feasible?



6. Did you find telehealth service convenient?



7. The use of telehealth is worth my time



8. I prefer the use of telehealth over a face to face visits



9. Was the lack of physical contact acceptable?



10. Would you do it again? Yes/No

11. Have you ever been involved in a telehealth consultation before? Yes/No

12. Would you participate in another telehealth consult in future? Yes/No

13. How many consultations have you done till now? \_\_\_

14. How many hours do you dedicate for telehealth service per day? \_\_\_

Additional Comments? \_\_\_\_\_