Utility of telehealth for multidisciplinary assessment and management of patients with facial nerve palsy

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Background: The Sydney Facial Nerve Service is a multidisciplinary team that provides management of patients with facial nerve disorders, historically as an in-person format. The coronavirus disease 2019 (COVID-19) pandemic resulted in a shift to a virtual format due to infection control precautions. This study aims to evaluate the acceptability of a telehealth format for patients and clinicians in the multidisciplinary care of facial nerve palsy.

Methods: The questionnaires were distributed either on email or mail out. Follow up telephone calls were made to non-responders. Parallel, but specific questions were designed for both patients and clinicians who have attended the clinic.

Results: 40/110 patients (36.4%) and 11/11 clinicians completed questionnaires. Seventeen patients (42.5%) attended virtually, 14 (35.0%) attended in person, and nine (22.5%) attended both formats. All patients were equally satisfied with the assessment and overall experience with the clinic (P=0.900). Most patients (72.5%, 29/40) preferred in-person attendance, with preferences similar for patients from greater Sydney (80.8%) and regional/rural NSW (85.7%). Significantly more patients from interstate (57.1%) preferred a virtual format (P=0.027). Patients who required to travel >6 hours preferred virtual attendance but was not significant (P=0.053). Clinicians expressed good/excellent overall satisfaction with virtual attendance. There was a significant preference amongst the clinicians (9 of 11) for a hybrid format (P=0.003).

Conclusions: Patients and clinicians were satisfied with the virtual format for assessment of facial nerve palsy. Most patients expressed preference to an in-person format whilst clinicians preferred a hybrid model. Given the high rates of satisfaction and convenience recorded, we continue to utilise a hybrid format.

Keywords: Facial nerve palsy; telehealth; coronavirus disease 2019 (COVID-19)

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Introduction

Telehealth refers to the utilisation of telecommunications in the delivery of healthcare, allowing patient consultation and review to be performed remotely via conferencing tools (1). Whilst originally designed for rural benefits to mitigate travel, utility spread considerably and rapidly during the coronavirus disease 2019 (COVID-19) pandemic (1). Benefits include improved convenience for patients and clinicians, increased access to specialist care, decreased cost and increased efficiency (2-4). However, there were potential disadvantages of this format, including the possibility of patient privacy breaches, unfamiliarity with technology leading to inefficiency of the consultation session and inability to perform a tactile-based physical examination of patients (5,6).

The Sydney Facial Nerve Service (SFNS) is a multidisciplinary clinic consisting of surgeons (otolaryngologists, head and neck, ophthalmologist and plastics/reconstructive), physiotherapists and speech pathologists. The clinic reviews around 60 people annually, with patients from a diverse locational background and aetiology of their facial nerve disease (7).

In early 2020, the COVID-19 pandemic led to a shift for the clinic to adopt a virtual format, with patients and clinicians joining via a secure video-conferencing platform. With easing of the social distancing rules, the clinic transitioned back into a mixed hybrid format of in-person and virtual for both patients and clinicians. The use of telehealth for facial nerve patients has shown good reliability between clinicians scoring patients facial nerve related movements through video movements, but insufficient agreement to in-person scoring (8). Sanches *et al.* in a review of the use of telehealth for facial nerve palsy reinforced further potential challenges in utilising a traditional 2D camera for examining 3D movement (5). Whilst the physical limitations have been discussed, there exists limited literature discussing how telehealth is perceived by patients and physicians who are participating in the management of facial nerve palsy.

This transition to telemedicine during the COVID-19 pandemic provided us the opportunity to evaluate perception and satisfaction of patients and clinicians who have experienced either or both formats, in order to inform and guide on potential future formats for clinics in the management of facial nerve palsy. We present this article in accordance with the STROBE reporting checklist (available at https://www.theajo.com/article/view/10.21037/ajo-24-5/rc).

Methods

The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the Ethics Review Committee (Royal Prince Alfred Hospital Zone) of the Sydney Local Health District, protocol number X19-0288, and informed consent was taken from all individual participants. A cross-sectional survey study was designed. Patients who were seen at the SFNS between 2019 and 2022 (pre-COVID-19 and during the COVID-19 pandemic) were recruited and following informed consent, with invitations to complete the questionnaires sent by mail, followed by an email if responses were not received at four weeks. Patients who were under 18 years of age, or had insufficient proficiency in English language, or were unable to give informed consent were excluded. All patients seen at the SFNS undergo assessment by the members of the team in a standard fashion. A comprehensive case history is taken prior to the clinic and presented to the SFNS multidisciplinary team. The patient then undergoes assessment of their facial function with opportunity for members of the SFNS to ask further questions, while another member transcribes key findings. The case is then discussed and consensus reached for management, and the patient was contacted by phone call after the clinic for ongoing follow-up. This format in the virtual clinic is similar, with the patient discussed over teleconferencing and assessed through video software. The hybrid format includes a mix of patients who attend face-to-face and those who dial in remotely. Information collected included demographics such as age, gender and location from the clinic, visit type (initial or follow-up, virtual or in-person) and duration. Their experience and satisfaction were measured with a series of questions utilising a Likert scale from 1 (very poor) to 5 (excellent) (Appendix 1). A follow up telephone call was made to non-responders to attempt to reduce selection bias.

Members of the SFNS similarly completed a questionnaire of nine items (Appendix 2). Information regarding clinicians' roles (clinical position and number of clinics attended) and experience and satisfaction with the clinics on a Likert scale from one to five were measured. Incomplete responses were not included in analysis.

Descriptive statistics and analysis for statistical significance were used to compare the data between groupings of attendance and location of residence. Comparison between

Table 1 Characteristics of study participants (out of Sydney is defined as participants who reside in regional NSW and interstate)

Characteristics	Overall (n=40)	Telehealth (n=17)	In person (n=14)	Both (n=9)
Age (years), mean ± SD	46.6±20.0	49.4±17.3	43.8±25.0	45.8±17.6
Gender, n (%)				
Female	25 (62.5)	13 (76.5)	8 (57.1)	4 (44.4)
Male	15 (37.5)	4 (23.5)	6 (42.9)	5 (55.6)
Greater Sydney, n (%)	26 (65.0)	7 (41.2)	10 (71.4)	9 (100.0)
Regional or rural NSW, n (%)	7 (17.5)	4 (23.5)	3 (21.4)	0
Interstate, n (%)	7 (17.5)	6 (35.3)	1 (7.1)	0

SD, standard deviation.

Table 2 Survey responses from patients grouped by format of attendance (n=40)

Questions	Format [mean (SD), median]			P value
	Telehealth	In-person	Both	
Estimated travel time to clinic (hours)	3.6 (1.6), 5	2.7 (1.7), 2.5	2.1 (0.8), 2	0.017
Ability to show your facial nerve concerns clearly to the clinicians	4.1 (0.8), 4	4.4 (0.8), 5	4.1 (1.1), 4	0.515
How well do you think the clinicians understood your concerns	4.1 (1.1), 5	4.5 (0.9), 5	3.9 (1.4), 4	0.424
Ability to engage with the clinic	4.1 (1.1), 4	3.9 (1.1), 4	4.3 (1.0), 5	0.675
How well your concerns and questions were addressed	3.7 (1.1), 4	4.1 (0.9), 4	3.9 (1.4), 4	0.511
How satisfied were you with the proposed management plan made	4.0 (1.4), 5	4.1 (0.8), 4	3.9 (1.5), 5	0.865
How would you rate the convenience for attending the clinic	4.7 (0.7), 5	3.9 (1.1), 4	4.2 (1.0), 4	0.029
Overall satisfaction with the format of your visit	4.1 (1.1), 5	4.4 (0.8), 5	4.1 (1.4), 5	0.767

Survey answers range from 1 (very poor) to 5 (excellent). Those who attended both were asked to respond regarding their virtual attendance. SD, standard deviation.

groups was performed using ANOVA analysis χ^2 testing. Tukey post-hoc analysis was used to identify significance between pairs within groups, as was Mann-Whitney for non-parametric comparison between groups. Statistical significance was defined as a P value of <0.05. Statistics were analysed using Jamovi [The Jamovi project (2023). Jamovi (Version 2.3). Retrieved from https://www.jamovi. org, Sydney, Australia].

Results

During the study period, 110 patients attended the SFNS MDT clinic. Forty patients (36.4%) fully completed the questionnaire (*Table 1*). The mean age was 46.6 years (standard deviation: 20). Twenty-five (62.5%) patients were female and 15 (37.5%) were male. Most patients (26/40,

65.0%) were from the greater Sydney area. Seven patients were from a regional or rural area (17.5%), and seven (17.5%) were from interstate. Seventeen patients (42.5%) only attended the clinic virtually, 14 (35.0%) only attended in person and nine (22.5%) had previously attended the clinic in person but attended the clinic virtually during the study period. Among patients attending virtual appointments, the majority (16/25, 64.0%) were online for 15–45 minutes. There were no significant differences between age, gender or location between those who attended in person compared to virtually (P>0.05).

Responses from the questionnaire were compared in *Table 2*. There were no significant differences in survey responses evaluating the ratings of the clinic between those who attended via telehealth, in person or those who attended both, except for estimated travel time to clinic,

Table 3 Clinician responses to questionnaire

Characteristic	Value
Position, n (%)	
Surgeons	8 (72.7)
Allied health	3 (27.3)
Number of clinics attended, n (%)	
3–5	1 (9.1)
>5	10 (90.9)
Preferred format, n (%)	
Total virtual	1 (9.1)
Hybrid	9 (81.8)
In person	1 (9.1)
Questions, mean (95% CI), median	
Ability to see the patient's facial function in the virtual format	4.0 (0.8), 4
Ability to understand the patient's concerns	4.2 (0.6), 4
Ability to engage with the clinic through the virtual format	3.7 (0.8), 4
Ability to answer questions and concerns from the patient	3.7 (0.8), 4
How satisfied were you with the proposed management plan made	4.4 (0.5), 4
Overall satisfaction with the format of your visit	4.1 (0.5), 4

Survey answers range from 1 (very poor) to 5 (excellent). CI, confidence interval.

with the difference showing those who attended telehealth had longer expected travel time than those who attended in person (3.6 vs. 2.7 hours, P=0.017). On a Likert scale of 1 to 5, 30 patients (75.0%) rated their overall experience as either good or excellent, and there was no difference in this rating between those who attended virtually or in person (P=0.900). Patients felt that in either format, they were able to show their concerns, and able to engage and have their concerns addressed. Equally, no differences were detected in the responses amongst patients from the city, regional or rural NSW, age or interstate (P=0.473).

Comparison of convenience between in-person and virtual attendance revealed those attending virtually reporting significantly higher levels of convenience (mean 4.7 vs. 3.9, P=0.029).

Preference for format of attendance was compared between the groups. Overall, 29 of the 40 (72.5%) patients preferred in-person attendance. On subgroup analysis, 12/14 (85.7%) patients who had attended in virtual format, 9/16 (56.3%) patients who attended in person and 8/9 (88.9%) of patients who had attended both formats indicated a preference for in-person format. When comparing between patients who preferred the virtual format over an in-person format, there were no significant differences found between gender (3/15, 20% for males vs. 5/25, 20% for females, P=0.43), or age (3/20, 15% of those <50 years vs. 4/20, 20% for those ≥50 years, P=0.4844). There was a significant difference when comparing the preference of the clinic format with regards to the location of the patients with 80.8% (n=21) of patients from greater Sydney, 85.7% (n=6) from regional and rural NSW and 42.9% (n=2) of interstate patients with a preference for an in-person format (P=0.0027). When this is examined by travel time, 81.5% (n=22) of those less than six hours away via travel preferred an in-person format, compared to 53.8% (n=7) of those further than six hours travel time away (P=0.053).

Twelve patients provided qualitative comments on their experiences, all of whom attended a virtual format. Four of the 12 expressed a positive experience at the online format relating to convenience and access to multiple specialists, four expressed belief that an in-person format would allow better showing of their facial function and felt limited by their video technology, two reported frustration; one regarding wait times in the clinic and one regarding follow up being delayed over the Christmas period and two expressed concerns that the in-person format did not allow their concerns to be addressed adequately due to the virtual format with belief only some clinicians in the meeting were paying attention.

Clinician responses were compared in *Table 3*. Fourteen clinicians were surveyed with 11 responders (78.5%), 8 (72.7%) of which were surgeons and three of which were allied health professionals; with most clinicians (10/11) having attended more than five clinics. Most clinicians expressed good or excellent overall satisfaction with the virtual format [median =4 (good), interquartile range 0], and responses were comparable with patients (*Figure 1*). The most prominent clinician concern with the virtual format was the difficulty in observing patients' facial function, with four responders (36.4%) reporting neutral satisfaction with this and the other seven (63.6%) reporting good or excellent satisfaction. There was a significant preference amongst the clinicians (9 of 11) for a hybrid format (P=0.003) with only one preferring a totally in-person format and one who had no preference (*Figure 2*).
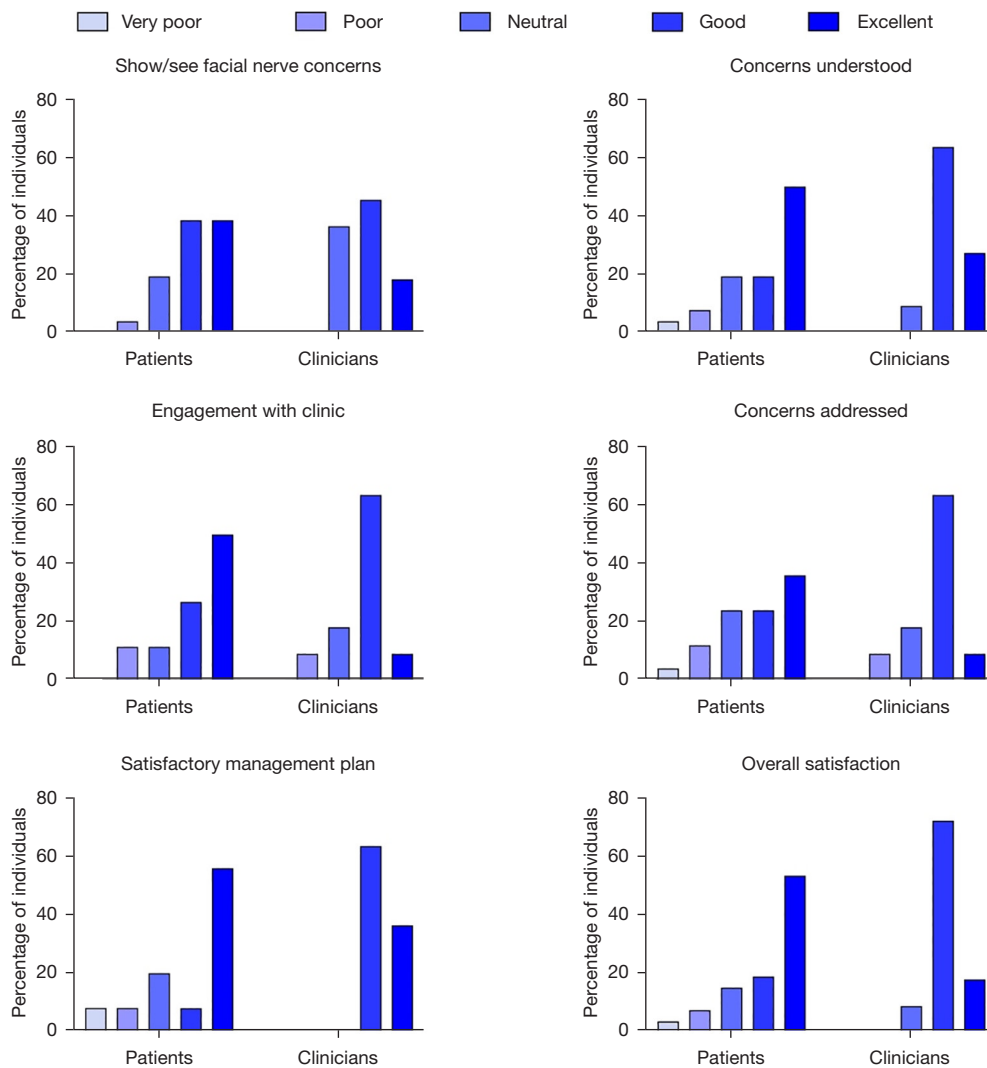
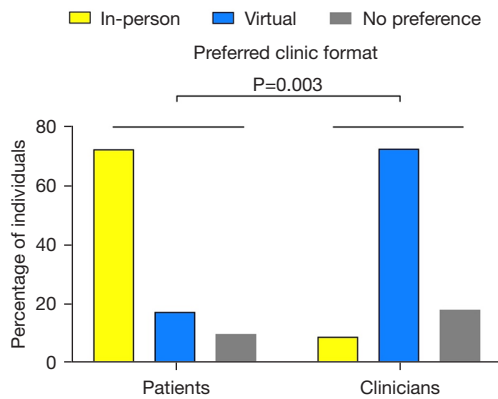**Figure 1** Comparison of patient and clinician questionnaire scores.

Figure 2 Patient and clinician preference for clinic format.

Discussion

This study investigated the experience of patients and clinicians who attended or are members of the SFNS regarding their experience and preference of adopting telehealth in the assessment and management of facial nerve palsy. The COVID-19 pandemic provided us with this unique opportunity to evaluate the acceptability of this technology. Interestingly, there was an overwhelming preference for face-to-face contact from the patients regardless of their distance to the clinic, age group or the format they were exposed to when reviewed at the clinic. The survey also indicated that patients were able to

engage with the clinic, receive a satisfactory management plan, convey their concerns and have them understood by the clinicians adequately in either format of the clinic. Clinicians, on the other hand, preferred the flexibility of a hybrid format.

Those who attended from regional or rural NSW preferred an in-person review at the highest frequency, with 85.7% of participants selecting such, seemingly at odds with other series identifying a regional or rural background as a factor in preferring a virtual performance (9). However, an important feature in patient preference for telehealth has been shown, that it is least preferred for new physical symptoms, under which facial nerve palsy would fall (10). Our patient feedback commonly identified feeling that the video format was insufficient for showing their limitations they experience in their facial function.

Patients from interstate locations had the lowest preference for in-person attendance (28.6%), in keeping with identified factors of cost and time saving as having a significant impact on telehealth preference (10). Our data did not reveal a significant difference in preference by travel time, but the trend indicated those further than six hours away were more likely to prefer a virtual format. Distance from a physical clinic is a factor to consider when assessing the utility of telehealth. Australia has particular challenges being such a large, and in some regions, very sparsely populated, country. Australian rural oncology services using telehealth have demonstrated cost savings and reduced waiting times as benefits within a service that is also acceptable to patients and health professionals (11), with further work performed prior to COVID-19 in speech pathology showing telehealth to enhance efficiency with high treatment satisfaction (12).

It is important to note that while patients may prefer in-person review over telehealth (with 88.9% of those who had attended both formats preferring an in-person review), there were no discernible significant differences in their perception of care as measured by this questionnaire. Telehealth models used in other settings for neurological function have mirrored similar high satisfaction with a telehealth format (13), but larger studies have consistently shown patients to prefer an in-person format (14-16). In the context of COVID-19 and public health restrictions, where telehealth became a necessity, there was no evidence of a poorer patient perspective for the treatment they received.

Clinicians were satisfied with their ability to achieve clinical assessment and generate a satisfactory management plan in a virtual format, and prefer this format overall.

Overall, ratings had a median score of "Good" for all domains. The main limitation of telehealth includes the concern for lack of reliable examination of patients. Previous work evaluating the scales commonly used, including the Sunnybrook Facial Grading Score, the House-Brackmann score and the Synkinesis Assessment Questionnaire, showed good levels of inter-assessor and inter-assessment reliability except in synkinesis. This translated to assessment comparison between in-person and video analysis, showing good reliability between the two, but insufficient reliability in synkinesis (8,17). The use of standardised video assessment tools such as the eFACE application are suspected to mitigate this (5).

Interestingly, clinicians strongly preferred the virtual or hybrid format over the in-person form. While the reasons for this were not explored in this study, qualitative work in clinician acceptance of telehealth has found excellent ratings in convenience as a large factor in telehealth uptake (18,19). Our clinic features a large multidisciplinary team, and the use of a virtual attendance option has expanded the access of clinicians who may not be able to make it for other reasons to allow them to attend and provide further input as part of patient care.

Limitations

The main limitation regarding this study relates to selection bias, where patients who were seen via virtual clinic were likely more accepting of this method as they had already chosen to attend in this format. Our response rate of 40 of the 110 eligible may have also introduced bias, where only patients who were motivated to have the virtual format reverted back to a face-to-face format responded to the survey, and may reduce how representative this was of people who have attended the clinic.

Future directions

While this survey study examining the overall satisfaction with telehealth in the management of facial nerve palsy shows the acceptability of this format, a qualitative study with short form interviewing could inform more about the perception of the format for facial function. Analysis of the management of facial nerve palsy in those treated by telehealth and in-person could be performed to examine if there are any differences between the formats.

Given the high rates of satisfaction and convenience within this study, we continue to offer a hybrid clinic format

to allow patients a virtual option to attend. We believe this is a suitable model for facial nerve palsy management and can be extended to similar specialist clinics.

Conclusions

We have described the acceptability of telehealth to both patients and clinicians in a multidisciplinary facial nerve clinic. This study also informed us that the key concerns and measures of patient satisfaction are preserved in the virtual format. Most patients expressed a preference to have their assessment and consult in a face-to-face setting; in contrast, clinicians preferred either a virtual or hybrid model.

Acknowledgments

Footnote

Reporting Checklist: The authors have completed the STROBE reporting checklist. Available at https://www.theajo.com/article/view/10.21037/ajo-24-5/rc

Data Sharing Statement: Available at https://www.theajo.com/article/view/10.21037/ajo-24-5/dss

Peer Review File: Available at https://www.theajo.com/article/view/10.21037/ajo-24-5/prf

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://www.theajo.com/article/view/10.21037/ajo-24-5/coif). S.C.'s ICMJE uniform disclosure form is in the https://cdn.amegroups.cn/static/public/AJO-2024-01-Supplementary.pdf. The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. This study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the Ethics Review Committee (Royal Prince Alfred Hospital Zone) of the Sydney Local Health District, protocol number X19-0288, and informed consent was taken from all individual participants.

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Appendix 1 Patient survey

Age	_____ years
Gender	☐ Female ☐ Male ☐ Non-binary
Home address location	☐ Sydney City ☐ Greater Sydney ☐ Regional NSW ☐ Rural NSW ☐ Interstate ☐ International
Visit Type	☐ Initial Visit ☐ Follow-up
Format of the clinic you attended	☐ Virtual ☐ In-person ☐ Both
Date of clinic(s) attended	*[please enter response here]*
(If virtual) Estimated time from the moment you logged in, until the appointment finished?	☐ 5 – 15 minutes ☐ 15 – 30 minutes ☐ 30 – 45 minutes ☐ 45 – 60 minutes ☐ >60 minutes
Estimated time it would/did take to make a round-trip to the clinic and commute home	☐ 0 - 1 hour ☐ 1 – 2 hours ☐ 2 – 3 hours ☐ 4 – 5 hours ☐ >6 hours
In future, would you prefer to attend a clinic in-person or virtually?	☐ In-person ☐ Virtually ☐ No preference

PLEASE TICK YOUR RESPONSE TO THE FOLLOWING QUESTIONS BASED ON THE LIKERT SCALE PROVIDED

Please rate the following and tick <u>ONE box only</u>	5 – Excellent	4 - Good	3 – Neutral	2 - Poor	1 - Very poor
Ability to show your facial nerve concerns clearly to the clinicians	☐	☐	☐	☐	☐
How well you think the clinicians understood your concerns	☐	☐	☐	☐	☐
Ability to engage with the clinic	☐	☐	☐	☐	☐
How well your concerns and questions were addressed	☐	☐	☐	☐	☐
How satisfied were you with the proposed management plan made in the clinic?	☐	☐	☐	☐	☐
How would you rate the convenience for attending the clinic (in person or virtually)?	☐	☐	☐	☐	☐
Overall satisfaction with the format of your visit	☐	☐	☐	☐	☐

(OPTIONAL) Please provide any additional feedback on your visit with the Sydney Facial Nerve Service

_____

_____

_____

Appendix 2 Clinician survey

Position within the Sydney Facial Nerve Service	☐ Surgeon ☐ Other (please specify): _____		☐ Allied Health	
How many virtual clinics have you attended?	☐ 0	☐ 1–3	☐ 3–5	☐ >5
What is your preference for clinics moving forwards?	☐ Total virtual	☐ Hybrid clinics		☐ In-person

Please rate the following for the virtual format:	5 - Excellent	4 - Good	3 - Neutral	2 - Poor	1 - Very poor
Ability to see the patient's facial function in the virtual format	☐	☐	☐	☐	☐
Ability to understand the patient's concerns	☐	☐	☐	☐	☐
Ability to engage with the clinic through the virtual format	☐	☐	☐	☐	☐
Ability to answer questions and concerns from the patient	☐	☐	☐	☐	☐
Satisfaction in generating a management plan in the virtual format	☐	☐	☐	☐	☐
Overall satisfaction with the virtual format	☐	☐	☐	☐	☐