

## Main Article

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## Abstract

**Objective.** This study aimed to compare outcomes of telephone and face-to-face consultations for new rhinology referrals and discuss the wider use of telemedicine in rhinology.

**Method.** This was a retrospective cohort study of new rhinology referrals seen in either a telephone or face-to-face clinic. Primary outcome was the proportion of patients given a definitive outcome at initial appointment (discharged or added to waiting list) versus those requiring follow up.

**Results.** A total of 137 patients (70 telephone, 67 face-to-face) were included. A total of 45 of 67 patients (67 per cent) undergoing a face-to-face consultation received a definitive outcome following initial review, versus 11 of 70 (16 per cent) telephone patients. Of 70 telephone patients 57 (81 per cent) were followed up face-to-face for examination.

**Conclusion.** The role of telephone clinics in the assessment of new rhinology referrals is currently limited by the lack of clinical examination. Further research on developing remote assessment pathways that incorporate asynchronous review of recorded examinations are needed before telemedicine can become established within the rhinology clinic.

## Introduction

The novel coronavirus disease 2019 (Covid-19) pandemic has had a marked impact on the practice of otorhinolaryngology in the UK; however, this additional pressure on the National Health Service (NHS) has acted as a catalyst for exploring novel pathways for the assessment and management of new referrals. The use of telemedicine has emerged as an increasingly viable approach for out-patient review, driven by a need to reduce footfall within the hospital environment, optimise clinic capacity through triaging and manage ever-increasing waiting times.<sup>1</sup>

Commonly, this has involved the use of telephone consultations as the most simple form of remote-assessment, where it has been suggested that many routine ENT referrals can be managed over the telephone without the need for a face-to-face assessment.<sup>2</sup> Likewise, telephone triaging alongside a validated risk stratification calculator has been used to good effect in the initial assessment of suspected head and neck cancer patients, demonstrating a low risk of harm and the potential to optimise the patient experience by preventing unnecessary hospital attendances.<sup>3</sup> Although telephone consultations are effective in many circumstances, a visual inspection of the ear, nose or throat, via either an otoscope, rigid endoscope or flexible nasendoscope is central to a routine out-patient examination for many patients. This is likely to be even more pertinent for the assessment of new referrals, who have not been examined previously, compared to follow-up appointments.

For rhinological referrals specifically, a visual examination of the nasal cavity is often essential for the assessment and diagnosis of common pathologies, such as chronic rhinosinusitis, nasal polyps, septal deformities and turbinate hypertrophy. To date, there is nothing in the published literature looking specifically at telephone consultations for the management of new rhinology referrals and how the outcomes compare with traditional face-to-face assessments. This data is essential to provide more information about the potential benefits and drawbacks of telephone consultations to better inform future referral pathways and optimise patient care. This retrospective cohort study compares telephone and face-to-face consultations for new rhinology referrals with respect to clinic outcomes and discusses wider issues regarding the use of telemedicine in rhinology.

## Materials and methods

This study was conducted at a UK secondary and tertiary referral unit. The study was prospectively registered as a service evaluation and approved by our institutional review board.

### Sampling

This study included all new rhinology referrals to a single consultant rhinologist. Patients had been allocated to a face-to-face clinic or a telephone clinic by either the bookings office or secretarial team at our unit, based on clinic availability, unless a referral had been specifically triaged and sent to a face-to-face clinic by the consultant in charge.

Patients were excluded if they were seen as follow-up cases, referred with a non-rhinological complaint or if they were referred to a specialist joint clinic, such as the multidisciplinary allergy or vasculitis clinic. As this study was conducted retrospectively, management decisions made by the consultant were not influenced by the study. Sample size was calculated based on a 95 per cent confidence interval and a power of 80 per cent. In the absence of previous literature, it was the authors' consensus that a difference of 25 per cent for the number of patients followed up versus the number of patients definitively managed should be detected between the face-to-face and telephone groups, and therefore the minimum sample size was 55 patients in each group.

### Data collection

Data were collected retrospectively from the digital patient records system at our institution by a single author (CM). Data recorded for each of the face-to-face and telephone clinic groups included patient demographic data, referral source, time from referral to review, clinic outcome, and details of treatments given, investigations organised, and follow-up plans. Follow-up data were collected for patients in the telephone clinic cohort who were brought back for a face-to-face review, in addition to follow-up data for all patients to ascertain the total number of clinic appointments required to reach a definitive outcome.

### Data analysis

All data were entered into a standardised spreadsheet for analysis. The primary outcome measure was the proportion of patients with a definitive management outcome (discharged or added to a waiting list for treatment) versus the proportion of patients requiring face-to-face clinic follow-up for further assessment or review.

Descriptive statistics were performed to analyse patient demographic data, referral source, waiting times and clinic outcomes. Chi-square and odds ratios were calculated by comparing the number of patients with a definitive outcome following initial review versus those followed up for the face-to-face and telephone clinic groups. Independent sample *t*-test was conducted to compare the mean number of appointments required for definitive management between the two cohorts. All statistical analysis was performed using SPSS® (version 28) statistical software.

### Results

A total of 137 patients were included in the analysis. There were 70 (51 per cent) females and 67 (49 per cent) males. The mean age was 48 years (range, 17–90 years). The mean waiting time from general practitioner referral to review was 12 months (range, 0–26 months). There were 70 new rhinology patients that underwent a consultation in a telephone clinic between May and October 2021. Because of the

**Table 1.** Summary of patient characteristics

Parameter	Face-to-face cohort	Telephone cohort
Patients ( <i>n</i> )	67	70
Mean (range) age (years)	49 (19–90)	41 (17–85)
Female/male ( <i>n</i> )	31/36	39/31
Mean (range) time from referral to review (months)	10 (0–21)	15 (0–26)

Covid-19 recovery, fewer new rhinology patients were being seen face-to-face, and therefore the data collection period was extended to include 67 patients in the face-to-face group between March 2021 and February 2022. The patient characteristics of the face-to-face and telephone cohorts are summarised in Table 1. The outcomes between the two cohorts are compared in Table 2.

### Face-to-face consultations

Of the 67 patients included in the face-to-face cohort, the mean age was 49 years (range, 19–90 years) with patients waiting a mean of 10 months from date of general practitioner referral to clinic review (range, 0–21 months). Patients waiting less than one month for review had been referred on an urgent or two-week-wait basis for reasons such as unilateral obstruction and epistaxis or unilateral nasal lesions. Referral sources included general practitioners (50), internal referrals from a different ENT subspecialty (1), external ENT departments (5), oral and maxillofacial surgery (5), renal medicine (2), orthopaedic departments (1), neurosurgery (1), and accident and emergency (1). In one patient, we were unable to locate the referral information.

Presenting symptoms for patients in the face-to-face clinic cohort are summarised in Table 3. A definitive outcome was reached in 45 out of 67 patients (67 per cent), where they were either discharged (33, 49 per cent) or added to a waiting list for treatment (12, 18 per cent) following initial clinic review. Follow up was scheduled for 22 of 67 (33 per cent) patients in the face-to-face clinic for indications such as a review following a trial of medical therapy and/or investigations (16), a review and discussion about surgery (5), or to discuss surgery following an anaesthetic assessment (1). Only 1 patient was seen by a registrar in clinic, with the remaining 66 seen by the named consultant rhinologist.

### Telephone consultations

Of the 70 patients included in the telephone clinic cohort, the mean age was 41 years (range, 17–85 years), with patients

**Table 2.** Summary of the number of patients with a definitive outcome (discharged or added to waiting list for intervention) versus number of patients followed-up for both face-to-face and telephone clinics

Clinic type	Outcome		Total patients ( <i>n</i> )
	Patients definitively managed ( <i>n</i> )	Patients followed up ( <i>n</i> )	
Face-to-face	45	22	67
Telephone	11	59	70

Chi squared, <0.001; odds ratio, 10.97

**Table 3.** Summary of presenting complaints in the face-to-face clinic cohort

Presenting symptom	Value (n)	Value (%)
Nasal obstruction	22	33
Nasal swelling	12	18
Epistaxis	5	7
Hyposmia	4	6
Sinusitis	4	6
Nasal crusting	3	4
Odontogenic sinusitis	3	4
Nasal injury	3	4
Facial pain	3	4
Rhinitis	2	3
Post-nasal drip	1	1
Snoring	1	1
Cough	1	1
Foreign body	1	1
Septal perforation	1	1
Sinonasal inverted papilloma	1	1

waiting a mean of 15 months from the date of general practitioner referral to review (range, 0–26 months). Referral sources included general practitioners (48), internal ENT referrals from a different subspecialty (6), external ENT departments (1), oral and maxillofacial surgery (5), respiratory medicine (6), gastroenterology (1), rheumatology (1), pain team (1), and plastic surgery (1).

Presenting symptoms for patients in the telephone clinic cohort are summarised in Table 4. A total of 11 of 70 patients (16 per cent) were discharged, with no patients added directly to a waiting list for definitive treatment. Of the patients who were discharged, 8 of 11 (73 per cent) reported that their symptoms had resolved. A further one patient was already being managed at a different hospital, and one patient was referred to a different specialty. Outcomes for the discharged patients are summarised in Table 5. Follow-up appointments

**Table 4.** Summary of presenting complaints in the telephone clinic cohort

Presenting symptom	Value (n)	Value (%)
Nasal obstruction	21	30
Facial pain	7	10
Sinusitis	7	10
Nasal swelling	6	9
Epistaxis	6	9
Rhinitis	6	9
Hyposmia	6	9
Nasal injury	2	3
Septal perforation	2	3
Snoring	2	3
Cacosmia/phantosmia	2	3
Cough	1	1
Post-nasal drip	1	1
Infected implant	1	1

were arranged for 59 out of 70 (84 per cent) patients; 57 out of 70 (81 per cent) follow-up appointments were face-to-face for clinical examination, and 2 out of 70 (3 per cent) were given telephone follow up. Of the two patients given telephone follow up, one had already undergone examination with nasendoscopy followed by a magnetic resonance imaging scan at a different hospital, and one patient had dementia and multiple co-morbidities, making travel to the hospital impractical.

#### Telephone patients brought back for face-to-face review

Of the 57 patients brought back to a face-to-face clinic following telephone consultation, follow-up data were available for 43 patients, with 14 patients not yet reviewed. A total of 31 out of 43 (72 per cent) patients were discharged following the face-to-face appointment. Of these, eight patients were discharged with a plan to write to the patient and general practitioner with the outcome of investigations such as imaging (2), overnight pulse oximetry (3) or radioallergosorbent testing (3); however, none of these patients required further clinic follow up after the result of the investigations. A further three patients were discharged after declining the offer for surgical treatment; 2 of 43 (5 per cent) patients were added to a waiting list for surgical treatment including insertion of septal button (1) and septoplasty plus inferior turbinate reduction (1); 8 of 43 (19 per cent) patients were offered a further face-to-face clinic follow up for indications such as review following trial of treatment (2), review with the results of imaging (3), follow up in the joint facial pain clinic (1), follow up in the joint allergy clinic (1) and follow up to re-discuss septorhinoplasty following initial assessment and clinical photography (1).

#### Number of appointments required for definitive outcome

At the time of data collection, 58 patients in the face-to-face cohort and 52 patients in the telephone cohort had either been discharged or added to a waiting list for treatment. The mean number of appointments required to reach a definitive outcome was 1.2 in the face-to-face cohort and 2.0 in the telephone cohort ( $p < 0.001$ ). One patient from the telephone cohort was excluded as they had received a telephone follow up with another clinician, rather than the face-to-face follow up that was originally requested. As a result, they required four appointments to reach a definitive outcome, but this was felt to represent administrative error rather than a reflection of the initial telephone consultation. A summary of overall outcomes is included in Table 6.

## Discussion

This retrospective comparative study included 137 new rhinology referrals to a busy UK teaching hospital and compared clinic outcomes of patients reviewed remotely in a telephone clinic to patients seen in a traditional face-to-face clinic. To the authors' knowledge, this is the first published study looking at the use of telephone clinics in rhinology that utilises a comparative face-to-face clinic group as a control.

The Covid-19 pandemic has had a profound impact on healthcare service delivery across all specialties, and telephone clinics were implemented in both primary and secondary care to facilitate patient assessment, triage and management while reducing footfall in the hospital environment.<sup>4–8</sup> In ENT specifically, there was widespread implementation of telephone

**Table 5.** Summary of patient characteristics for those discharged following initial telephone consultation

Age (years)	Gender	Presenting symptom	Telephone clinic diagnosis	Treatment
71	F	Septal perforation	Known septal perforation – symptoms improved	Nil
62	F	Altered smell	Resolved phantosmia	Nil
55	F	Chronic post-nasal drip	Post-nasal drip sensation	Nil
69	F	Nasal soreness	Resolved nasal irritation	Emollients
32	M	Sore throat and nasal obstruction	Resolved symptoms	Nil
85	M	Epistaxis	Resolved epistaxis	Emollients
20	M	Anosmia	Resolved anosmia	Nil
38	M	Snoring	Obstructive sleep apnoea	Referral to respiratory team
47	M	Infected rhinoplasty implant	Infected nasal implant	Patient managed at different hospital
60	F	Recurrent epistaxis	Resolved epistaxis	Emollients
20	M	Recurrent epistaxis	Resolved epistaxis	Nil

F = female; M = male

clinics, and there is evidence that these had an important role to play in managing patients throughout the pandemic.

Sargsyan *et al.*<sup>2</sup> undertook a descriptive analysis of 400 ENT patients undergoing telephone consultations, demonstrating that a number of patients could be managed without a face-to-face review. Of the new referrals reviewed, just over half required a face-to-face review, and this was mirrored in their subgroup of patients presenting with rhinological symptoms, where just over half of patients required a face-to-face follow-up appointment. This also highlights likely differences in practice between individual clinicians and institutions because these numbers are slightly lower than the 81 per cent of patients in our telephone clinic group who required face-to-face follow up for clinical examination.

Patient satisfaction with telephone consultations in ENT has also shown to be reasonable<sup>9</sup>; however, satisfaction scores increased following an educational package for clinicians to

help refine teleconsultation skills. This suggests that there is a learning curve associated with telephone consultations, and their use may become optimised as clinician skill and experience improves. There may also be patient factors at play, with increased acceptance as the use of telephone consultations becomes more normalised.

Swaminathan *et al.*<sup>10</sup> conducted a postal survey of 144 ENT patients who underwent a telephone consultation. Many of the respondents (65 per cent) had prior experience of telephone consultation in healthcare. Patients reported high satisfaction (96 per cent) and a desire to participate in telephone consultations again (89 per cent), although 46 per cent felt the telephone consultation was not as good as in person. Another area that telephone consultations have been used to good effect within ENT is in the triaging of two-week-wait head and neck cancer referrals. Hardman *et al.* demonstrated a low risk of harm when completion of a validated risk calculator was undertaken as part of a telephone consultation for over 4500 patients, with potential to optimise the patient experience by preventing unnecessary hospital attendances.<sup>3</sup> With waiting times increasing for ENT<sup>1</sup> and a need to streamline referrals, it is likely that telephone consultations will continue as part of the post-pandemic recovery.

Our data suggests that a clear limitation of telephone clinics, when it comes to the assessment of new rhinology referrals, is the ability to perform a visual inspection of the nasal cavity. This is a key diagnostic step and resulted in over 80 per cent of telephone consultation patients being booked in for a face-to-face assessment. When these patients were followed up, 72 per cent of them were discharged after the first face-to-face review. This is not to say that there was no value in the telephone consultation; for many patients, treatments such as nasal douching or nasal steroids were instigated or optimised following the telephone consultation, and the consultation also allowed an element of triaging. However, the need for a clinical examination in the telephone cohort necessitated almost double the number of appointments on average than the patients who were initially seen in a face-to-face clinic, in order to reach a definitive outcome. This was in contrast to the face-to-face clinic group where the discharge rate was considerably higher and the clinic follow-up

**Table 6.** Summary of overall outcomes available at the time of data collection

Parameter	Face-to-face cohort* (n)	Telephone cohort† (n)	P-value
Number not yet followed up from initial appointment	4	14	
Number receiving ongoing follow up for monitoring	4	2	
Deceased	1	1	
Excluded from analysis	0	1	
Patients with definitive outcome	58	52	
Appointments required to reach a definitive management outcome (mean ± SD)	1.2 (0.47)	2.0 (0.66)	<0.001

\*n = 67; †n = 70. Mean (standard deviation (SD)) number of appointments required to reach a definitive outcome was 1.2 in the face-to-face cohort versus 2.0 in the telephone cohort ( $p < 0.001$ )

rate was significantly lower. Furthermore, of the patients discharged following an initial telephone consultation, most reported that their symptoms had resolved and therefore no further review was required.

It is clear that telemedicine in ENT has a number of potential benefits, including reducing the footfall of patients in the hospital environment, and technological advancements in the form of increasingly high-quality image acquisition and the availability of secure store-and-forward technology have made it possible to progress with this. Telemedicine pathways have already been set up to manage two-week-wait head and neck cancer referrals, which utilise asynchronous review of remotely acquired nasendoscopic images to deliver consultant-led care remotely.<sup>11</sup> Incorporating clinical examination into a remote assessment pathway in rhinology would maximise pathway efficiency by increasing the proportion of patients who are managed definitively at their first appointment. This is in keeping with NHS England plans to focus on more efficient diagnostic pathways and a shift towards community-based hubs for patient assessment.<sup>12</sup> Reducing the number of hospital visits for patients has several advantages, such as maintaining patient safety in a Covid-19 endemic world, reduced pressure on hospital site services and a positive environmental impact. Indeed, in one study, the use of telephone consultations was estimated to reduce 1.25 tonnes of carbon dioxide emissions for 177 patients.<sup>6</sup> This is also in keeping with the Greener NHS Programme,<sup>13</sup> which aims to reach net zero for all carbon emissions controlled directly by the NHS by the year 2040. From a service perspective, the use of a remote-assessment pathway may offer optimised utilisation of consultant time and an increased capacity to review patients,<sup>11</sup> which may have a positive impact on waiting times. Qualitative work with otology referrals has also suggested that this type of pathway would be acceptable to patients, provided that their care is comparable to a traditional face-to-face review.<sup>14</sup>

Results from this study should be viewed in context with its limitations, namely that the reported outcomes for both telephone and face-to-face clinics reflect a single consultant and single institution practice; therefore, it is possible that the follow-up rates would differ for other clinicians and institutions. Nonetheless, the clinical presentations of patients in both cohorts were quite common, and as such our sample should be reasonably representative of most general rhinology practices. Although both groups were comparable in sample size and age and gender characteristics, more urgent referrals were seen in the face-to-face clinic, and it is likely that this would have had an impact on the observed outcomes. Additionally, when comparing the number of clinic appointments required to reach a definitive outcome, it should be noted that, at the time of data collection, a number of patients had either not yet had follow up from their initial appointment or were under ongoing review, and therefore they could not be included in the analysis.

- Following the coronavirus 2019 pandemic, the use of telemedicine has emerged as an increasingly viable approach for out-patient review of ENT patients
- This retrospective cohort study analysed use of telephone clinics for the assessment of new rhinology referrals to secondary care and compared them with a face-to-face pathway
- Telephone clinics do have a role in the assessment of new rhinology referrals but are limited by a lack of clinical examination
- Further research is required on the role of a telemedicine pathway in rhinology that utilises endoscopic examination of the nose and asynchronous assessment by a consultant rhinologist

## Conclusion

Telephone clinics do have a role in the review and assessment of new rhinology referrals; however, they are limited by the lack of visual inspection in the form of an endoscopic examination. As a result, the follow-up rate is significantly higher, with far fewer patients either discharged or added to a waiting list for treatment when compared with patients seen directly in a face-to-face clinic. Furthermore, patients required more appointments, on average, to reach a definitive diagnosis. Further research is required on the role of a telemedicine pathway in rhinology that utilises endoscopic examination of the nose and asynchronous assessment by a consultant rhinologist, to maximise the benefits of telemedicine while ensuring that a high proportion of patients receive a definitive management decision at their initial appointment and reducing unnecessary follow up.

**Competing interest.** None declared

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