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**North East London
Health & Care
Partnership**

SUSQI PROJECT REPORT

Remote Consultations in Dentistry

Start date of Project: 15th May 2023

Date of Report: 31st July 2023

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Background:

Remote consultations are being utilised by many healthcare professionals, facilitating a digital transformation landscape within teledentistry. Access to NHS dental care nationally has been the subject of widespread discussion recently and will become even more challenging as patients are living longer, with many retaining their natural teeth into old age. Remote consultations can facilitate access to dental services allowing clinicians to: screen patients; formulate treatment plans; discuss treatment options; discuss biopsy results and offer advice. This is especially beneficial for vulnerable patients who struggle to access dental clinics for reasons such as difficulty physically travelling to appointments; living a substantial distance from their local specialist service; relying on carers to support their dental attendance or having mobility or communication challenges.

The 2019 CQC report Smiling Matters showed concerning levels of declining oral health and reduced access to dental care amongst older adults living in care homes. It is therefore imperative that new strategies are implemented to improve the oral and general health of vulnerable patients such as this group and protect their equal right to access services in line with the Equality Act (2010).

Video and telephone consultations were introduced at the Royal London Dental Hospital during the COVID-19 pandemic when access to dental services had completely ceased nationally. Even in the ensuing months where dental practice had resumed, access remained limited, especially for vulnerable populations who were at a greater risk of contracting the virus, who form the majority of our patient cohort in secondary care.

The telehealth platform utilised for virtual consultations is Attend Anywhere, and a mixture of virtual and currently, telephone consultations are used for remote clinics across all the dental specialties. There are five specialties within our Dental Network that now utilise regular remote clinics. To date, there has not been a service evaluation ascertaining the extent of use, frequency, economic, social or environmental impacts. This report will evaluate these parameters to establish the contribution of remote consultations in dentistry to the Trust's 'Green Plan' and provide the necessary information to encourage clinicians to continue utilising this medium in their routine practice.



Part of the focus will be on Special Care Dentistry (SCD), a specialty that provides dental care for adult patients with additional medical, social, psychological, physical, or sensory needs (e.g., dementia, bed bound patients, learning disabilities). Being a secondary care specialist referral centre, the clinicians in the service currently treat only the most complex patients within these groups, and for many patients access to dental services is challenging. Referrals are triaged by a consultant and any patients with physical impairments are booked into the remote consultation clinics.

Specific Aims:

To evaluate the use of remote consultations (via video or phone) at Barts Dental Hospital over a two-year period. To demonstrate the current and projected carbon savings resulting from the use of remote consultations in comparison to face-to-face appointments.

Methods:

We reviewed the two service delivery options to identify differences in social, environmental and financial resource use before proceeding with measurement. Each face to face consultation would require patient travel, and consumables for a minimum of a dental examination (+/- further procedures) and require both a clinician and dental nurse to be present. A virtual appointment requires no travel, no consumables and one staff member.

The Special Care Dentistry (SCD) service is unique and was studied separately. Patients seen in SCD are adults who have additional access requirements and cannot be seen in primary care due to physical AND medical needs complicating their dental care. They often need private or hospital transport and are reliant on carers to attend appointments with them. When referrals are vetted in SCD, those with access challenges are added to the virtual consultation clinic to minimise hospital visits and maximise clinical efficiency. They are then booked in for a treatment visit(s) in order to stabilise their oral health for maintenance by their local Community Dental Service.

Our virtual service was already in operation, as highlighted in the introduction. In order to measure the impact of the service, engagement with various individuals was required, including

- Data analyst - to download the data from Cerner Millennium (Excel spreadsheets generated a total of 5050 patients with postcodes). Distances from postcodes were then inputted into Google Maps to establish distance from the patients homes to the Royal London Dental Hospital
- Staff - to establish the perceived impact for patients on using a remote consultation approach and to get feedback on staff wellbeing for the social element
- Patients - 40 patients consulted on the Special Care Dentistry Clinic were telephoned to obtain their feedback on the use of remote consultations
- Dental materials stores manager - to obtain order numbers and costs of consumables that are routinely used for face-to-face appointments
- Carbon modelling assistant - who provided guidance on how to carbon footprint remote consultations and face-to-face so that a comparison could be made
- Clinical governance lead - to highlight any incidents related to using remote consultations

Measurement:

Patient outcomes:

The following data was captured:

- Number of remote consultations, with the assumption that this would have replaced the face to face consultations



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- Number of clinical governance incidents reported that related to virtual consultations such as missed diagnosis.
- Questionnaire to clinicians regarding patient outcomes

Population outcomes:

For population outcomes, longitudinal studies with adequate sample numbers would be necessary but given the short time frame, this approach is not possible due to time constraints of this quality improvement project. However, the existing literature suggests that telemedicine can overcome access issue relating to transportation and geographical distance. This challenge of transportation and geographical distance was shown in this report where some of the patients included lived over 100 miles away. The use of virtual consultations have been shown to improve both access and health outcomes (Barbosa, et al., 2021).

Environmental sustainability:

CO₂e was calculated to estimate carbon emissions saved from not attending the dental hospital for a face-to-face appointment.

The carbon emission factor of a face-to-face appointment for our other specialties was taken from existing literature (PHE & CSH, 2018) reflecting patients who attend the Royal London Dental Hospital. This includes travel and consumables for a dental examination (5.50 Kg CO₂e per appointment).

The same carbon emission factor was adapted for our special care patients. The factor was re-calculated based on the average mileage for our patient cohort. The emission factor for miles driven in an average car (unknown fuel) was used (taken from Greenhouse gas reporting: conversion factors 2022) as it is likely that all travel by private vehicle due to mobility and physical disability needs.

- 5.50 Kg CO₂e - patient travel = 3.085 kgCO₂e per examination
- Average miles x emissions factor= 21.9272 miles x 0.3472 kgCO₂e/mile = 7.6131 kgCO₂e travel
- Examination + travel =10.6981 kgCO₂e per special care patient seen face-to-face

The carbon footprint of a telephone or video consultation took into account energy use and were taken from the Business Case Carbon Impact Tooling database, tab 'healthcare events'.

Emission factors:

- Face to face dental examination for other specialties: 5.50 kgCO₂e per appointment
- Face to face dental examination for special care patients: 10.6981 kgCO₂e per appointment
- Virtual appointment:
 - o 31 minute outpatient telephone consultation: 0.1 kgCO₂e
 - o 31 minute outpatient video consultation: 0.06 kgCO₂e

Economic sustainability:

The following data was collated:

- Costs of consumables that are required for the equivalent face-to-face consultations
- Dental nurse salary to calculate the proportion of a dental nurse salary saved (as the virtual consultations only requires a clinician).

Social sustainability:

- A questionnaire was sent to Special Care Dentistry patients to ascertain the social value of remote consultations
- A questionnaire was sent to clinicians explore impacts on session planning and staff wellbeing (e.g., stress)



Results:

Patient outcomes:

- The total number of remote consultations from May 2021 to April 2023 was 5050
- Peak consultation numbers (Figure 1) were seen from May 2021 during the pandemic and a downward trend thereafter, followed by a more stable trend. May 2022 to April 2023 was considered more representative of routine practice and reflects the future outlook of trends and this period was therefore used for data analysis.

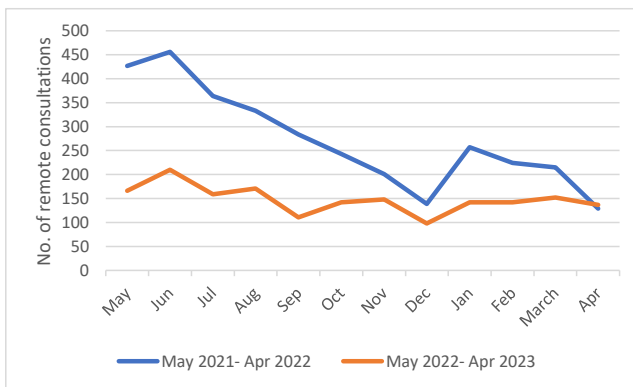
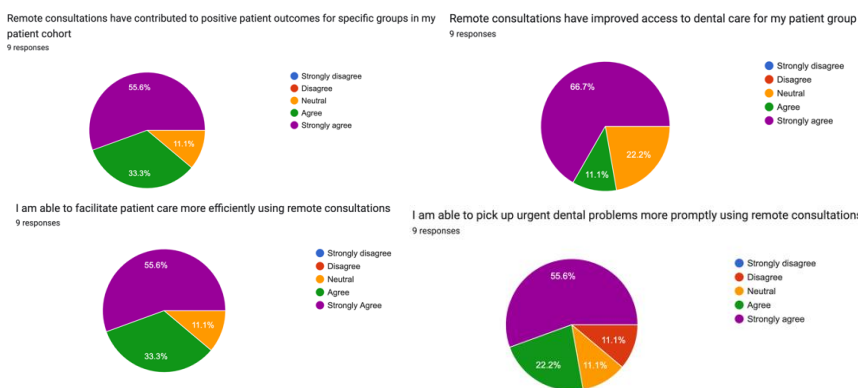


Figure 1: Number of remote consultations in Dentistry year comparisons

To date, there have been no reported incidents relating to remote consultations or delayed diagnosis resulting from the use of remote consultations.

Staff feedback:

Nine staff who participated in remote consultations answered the feedback form sent to them and were asked how much they agreed with statements related to remote consultations (Fig. 2). The majority strongly agreed or agreed that remote consultations have: improved access to dental care; contributed to positive patient outcomes and facilitated care more efficiently. Over two thirds felt they were able to pick up dental problems more promptly using remote consultations.



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Figure 2: Feedback from the staff questionnaire relating to remote consultations

Environmental sustainability:

In Special Care Dentistry the total number of miles between May 2021 to April 2023 would have been 4,641.77 (ALL transported via Vehicle) for patients if they would have attended for face-to-face appointments. For rest of specialties there were 1674 consultations between May 2022 and April 2023. Data was gathered for a two year period in special care as the amount consultations were maintained post pandemic. For comparative consistency, the figures were represented as a yearly figure (after dividing by 2). Data for rest of the specialties was only taken for a one year period due to reasons detailed in the patient outcomes section above (Table1) (See appendix for detailed calculations)

Annual Savings

Activity per year	Special Care Patients	Other Specialties Patients
Average number of consultations per year	165.5 (331 between May 2021 and April 2023)	1,674
Carbon footprint of the equivalent F2F consultations	1,770.54 kgCO ₂ e	9,207 kgCO ₂ e
Length of virtual consultation	45 minutes	30-35 minutes
Carbon footprint of performing consultations remotely	80% virtual, 20% telephone Virtual: 11.916 kgCO ₂ e Telephone: 4.965 kgCO ₂ e Total: 16.881 kgCO ₂ e	20% virtual, 80% telephone Virtual: 20.1 kgCO ₂ e Telephone: 133.92 kgCO ₂ e Total: 154.02 kgCO ₂ e
Carbon savings	1,753.7 kgCO ₂ e Equivalent to travelling 5,050.87846 miles in an average car and equivalent to travelling to Glasgow and back 6 times	9,053 kgCO ₂ e Equivalent to travelling 26,074 miles in an average car & equivalent to travelling to Glasgow and back 32 times

Table 1: Annual carbon savings from remote consultations

The total carbon savings per year is **10,806.7 kgCO₂e**.

All staff unanimously agreed that reducing the environmental burden of dental care through remote consultations was important to them (Fig. 3)

Commented [RM1]: Zahra - I asked Rosie if we could share the data in a table as I was worried your impressive savings were a little lost in all of the calculation figures. Rosie and I thought, if you want to keep your workings in that we move them to an Appendix? Or we could remove them but comment that further information on calculations is available by contacting you?



It is important to me that remote consultations reduce the environmental impact of dental care
9 responses

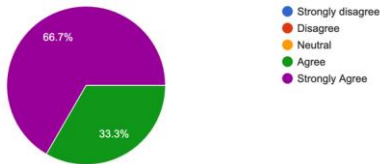


Figure 3 Staff feedback regarding remote consultations and their environmental impact

Economic sustainability:

Time spent on remote consultations was calculated as follows:

- Assume 30 minutes per remote consultation patient
- 30 mins x 1840.5 (all specialties +SCD) patients = 55,215 minutes = 920.25 clinical hours
- For remote consultations, no dental nurse is required, just the clinician so we can demonstrate the number of hours saved of dental nurse time should the patient have had to attend a face-to-face consultation
- Band 4 nurse 37.5 hours/week
- 920.25/37.5hrs week = 24.54 weeks = approx. 6 months of nursing hours /year
- **Each year remote clinics at Royal London Dental Hospital save the equivalent of the working of a 0.5 WTE (whole time equivalent) of a dental nurse based on time**

Another way of looking at the financial savings is to work out the estimated cost savings from virtual consultations over one year relative to the cost to the NHS from an outpatient consultation. An annual saving of £163,943.33 is estimated. Recent purchasing of desktops and equipment for a new dental clinic enabled estimation of the capital cost of a desktop plus accessories

Consultant basic wage starting	£93665
Oncosts (+25%)	£117082.5
Hourly rate	£56.29
30 mins	£28.14
Cost to tax payer for average NHS outpatient f2f consult	£120
Savings/consultation (Outpatient f2f-30min consultant wage)	£91.86
No. of virtual consultations	1840.5
Total consultation savings	£169068.33
Electronic devices (desktop, camera, mic) incl VAT x 5 specialties	£5125
Total savings	£163,943.33

Table 2: Financial savings based on cost to tax payer. Sources: Outpatient consultation cost to tax payer:

<https://econsult.net/blog/how-much-money-could-the-nhs-save-by-reducing-outpatient-dnas>;
Consultant wage: <https://www.healthcareers.nhs.uk/explore-roles/doctors/pay-doctors#:~:text=As%20a%20consultant%20from%201,known%20as%20Clinical%20Excellence%20Awards>

Consumables savings



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Commented [RH2]: Is there an average cost per NHS examination (cost to the NHS not to the patient) that we could apply here?

Commented [RM3]: Should we calculate this based on the same patient numbers as your CO2e and consumable savings? It is a little confusing that time is calculated with a higher number of patients/consultations as the other sections

Consumables that would have been used in the equivalent number of face-to-face consultations were calculated using figures derived from the team responsible for consumables ordering (Table 3)

Item	Price (£)	Price (£) + VAT	Quantity	£ Per item	Quantity/tre	Price(£)/ treatment
Apron	4.21	5.052	200	0.02526	1	0.02526
Masks	16.43	19.716	50	0.39432	1	0.39432
Gloves	13.33	15.996	200	0.07998	4	0.47988
Disposable exam kits	2.75	3.3	1	3.3	1	3.3
disposa shield	29.72	35.664	250	0.142656	5	0.71328
Suction tip	2.34	2.808	100	0.02808	1	0.02808
3 in 1 tips	21	25.2	250	0.1008	1	0.1008
Min total cos						5.04162

Table 3: Costs of consumables calculated per item used for an examination

1839.5 consultations (all specialties + special care dentistry 2022 to 2023) = £5.04 x 1839.5 = £9271.08 saved from consumables.

Social sustainability:

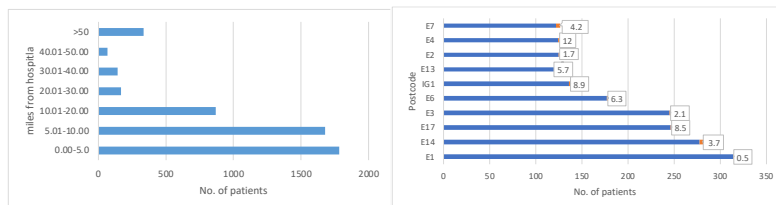


Figure 4: Distance patients having remote consultations live from the hospital (miles)

Overall, most patients live within a 10-mile radius within the North East London patch but surprisingly, over 300 patients lived more than 50 miles away, with a distance range 0.5-228 miles (Whitechapel- Manchester)

Feedback from 40 patients within Special Care Dentistry was obtained via telephone. Many had experienced difficulties in accessing dental care. Overall, patients responded positively to the effectiveness of remote consultations (Table 4).

	Average score out of 10
Difficulty in accessing dental care	7
Effectiveness in assessing need for dental treatment	7
Effectiveness in discussing management of anxiety/ cooperation	8
Effectiveness in establishing mobility, communication, medical history and capacity	8

Table 4: average scored out of 10 (1 being the least difficult/effective and 10 being most difficult/effective) from the patient feedback obtained over a telephone consultation

The American Society for Anaesthesiologists (ASA) Physical Status Classification System was used to identify the general health state of patients for which the feedback was based, suggesting that the majority had advanced disease.



- 10/40 (25%) = ASA 2 (well controlled systemic disease)
- 28/40 (70%) = ASA 3 (severe systemic disease or multiple co-morbidities)
- 2/40 (5%) = ASA4 (severe systemic disease that is a constant threat to life)
- 80% (32/40) of patients were impacted by mobility issues such as being bed bound, needing a wheelchair, zimmerframe, crutches or stretcher and/or hoist, or mobility impacted by systemic conditions such as Parkinson's disease. 20% had behavioural issues which made access to services difficult
- 62% of patients had communication issues such as cognitive impairments resulting in being non-verbal, translation requirements and dysphasia due to dementia and communication was with their carers
- Common barriers which patients reported in accessing dental care were significantly increased waiting times, delays, postponed treatment, feeling lost in the system and un-prioritised
- 94% preferred remote consultations over face-to-face consultations for their initial assessment
- Some comments included patients feeling that the remote consultations were not beneficial for highlighting their/the patient's dental concern, whilst others were surprised at the dentist's ability to provisionally develop treatment plans from the video consultation alone
- Many patients would attend with two carers or family members (86%), whilst 19% of the carers would have had to take time off work. For 48% of patients, carers would be attending as part of their job as a paid carer.

Feedback from staff

The feedback from nine staff who participated in remote consultations showed that using remote consultations have helped them plan appointments better and has helped reduce stress on the dental team, patients and carers. (Figure 5)



Figure 5: staff feedback regarding planning and stress

Discussion:

Whilst telemedicine has been utilised in medicine for decades, the global uptake of teledentistry is in its infancy. Prior to the COVID-19 outbreak, remote consultations were used mainly in orthodontics for screening of patients in the UK (Mandall, et al., 2005) and only seven papers had been published on teledentistry in peer reviewed journals globally compared to 86 since the pandemic (El Tantawi, et al., 2023). Teledentistry encompasses remote consultations, digital sharing of information, electronic patient records and electronic prescribing.

Despite being a practical discipline, remote consultations have a role in facilitating access to dental services but rely on the availability of technological infrastructure. Our results indicated that staff are supportive of including remote consultation in their management of patients. There is however a cost implication which includes the costs associated with the necessary software, computers, cameras, and microphones. These costs may act as a barrier to the uptake of remote consultations given the rise in dental practice expenses and constrained hospital budgets. We know from personal experience, that clinicians within our service are using their own laptop devices with a remote desktop that links to the hospital computer systems. This ensures patient confidentiality as the remote desktops are protected and the desktop computers available

for clinicians are situated in open plan clinics. The hope is that funding will be available to facilitate digital transformation in secondary care in accordance with the NHS' long term plan to become fully digitised by 2024 and there will be the provision of the equipment required to host remote consultations (The King's Fund, 2019).

Apart from Special Care Dentistry, most patients across other departments had their remote consultations via telephone. Due to the time constraints of the project, we were unable to elicit the reason for this as this would require further data gathering. It would be useful in future however, to identify barriers to accessing digital platforms which could explain the inclination towards using telephone for remote consultations. Possible reasons for this include challenges with digital literacy or a lack of digital equipment availability for clinicians.

We focussed on obtaining qualitative feedback from Special Care Dentistry as this specialty often sees patients with the most complex needs and those who struggle to attend in-person appointments due to disabilities or requiring carer support. We recognise that special care patients are not representative of the whole dental hospital patient cohort. However, given the difficulties this group experience in accessing care we felt it was important to obtain feedback from these patients and their carers.

Commented [RM4]: Should this be we focused on obtaining feedback from special care dentistry patient cohort - as your other measures have covered both special care and other specialties!

At the Royal London Dental Hospital, Band 4 dental nurse recruitment has been difficult, mainly due to salaries being lower than those received in primary care dental practice. This difficulty recruiting has resulted in under resourced clinics with lack of nursing support. Utilising remote consultations more frequently would help reduce the clinical pressures as no nurse is required and allow nursing staff to be redirected to treatment clinics.

The calculations presented in this report are not without their flaws. One of the limitations is that financial savings did not include energy consumption used for lighting and operating of the dental light, as well as savings from hospital transport (e.g., for patients transported by stretcher/ wheelchair). There was also the assumption that patients who have remote consultations would normally travel to the hospital by car. Whilst this is more likely for the special care dentistry patients, patients being assessed and reviewed by other specialties may travel by public transport or active travel. Interestingly, the furthest distance travelled by a patient was from Manchester. Being a highly specialised centre for many conditions that present in dentistry (e.g. trauma, special care needs, head and neck oncology) patients often have to travel great distances to seek dental care at the Royal London Dental Hospital which further highlights challenges with access. The positive feedback regarding improved access from remote consultations provided by both patients and clinicians was reflective of published data, suggesting that this is a good approach to use, especially for those who live in distant geographical regions.

The Community Dental Services who provide primary care dental services to local populations do not have a transport service level agreement. This means that patients who are treated in community dental services in NEL and are unable to self-resource transport to the clinic, must be referred to the Royal London Dental Hospital to access patient transport. Most of patients contacted for feedback on remote consultations from the special care dentistry clinic had advanced medical conditions or co-morbidities. Remote consultations have been shown to improve access and patient satisfaction for patients with co-morbidities (Jue, et al., 2017). Remote consultations have allowed treatment planning in advance of any procedure, saving clinical and patient time. For patients that struggle with cooperation with dental treatment such as those with severe learning disabilities, challenging behaviours can escalate with long treatment planning appointments making the provision of care not viable. For these patients, having a remote consultation prior to treatment means that when they attend appointments can be shorter and they find these appointments more manageable.



This approach has a snowball effect as reducing the need to come in for Face-to-Face treatment planning appointments benefits staff as they can plan for treatment sessions, efficiency is increased, and their stress is reduced.

Whilst the uptake of remote consultations has been good within the Royal London Dental Hospital, not all specialties have been engaged. Future work is therefore planned to roll out remote consultations across all specialties in the Dental Hospital using the Special Care Dentistry department as a case study to highlight the positive impact this can have in relation to patient feedback, staff wellbeing and sustainability.

Conclusions:

Remote consultations provide a convenient and economic option to improving access to NHS dental care whilst having the potential to improve the overall oral health status of patients. Savings highlighted in this report contribute to the Trusts' Green Plan (Barts Health, 2022). It is clear from the results that dental clinicians value the carbon savings resulting from remote consultations, indicating that there is an appetite for change.

Further work is required to publish the positive findings in this report and disseminate the information to the dental profession to improve engagement with other specialties, dental hospitals and primary practices.

Appendix

Carbon savings calculations in detail

The total number of travel miles saved from all remote consultations over the two-year period = 81,625.45 miles.

Special Care Dentistry Carbon Savings:

- In Special Care Dentistry the total number of miles between May 2021 to April 2023 was 4,641.77 (ALL transported via Vehicle) for patients attending for face-to-face appointments
- The savings from not performing a dental examination in clinic: Kg CO₂e of a dental exam x No. of special care patients = 10.6981 x 331 = 3541.079 Kg CO₂e over 24 months for dental examination
 - The proportions of remote consultations for Special Care Dentistry are approximately 80:20 virtual:telephone = 265:66
 - Consultations are 45 minutes long
- 265 x 0.09 = 23.85 kg CO₂e virtual consultation
- 6 x 0.15 = 0.9 kg CO₂e phone consultation
- Total = 33.75 kg CO₂e remote consultations
- 3541.079 - 33.75 = 3507.329 kg CO₂e over 24 months May 2021 to Apr 2023 which would roughly equate to 1753.665 kg CO₂e saved for special care from remote consultations per year. This is equivalent to travelling 5,050.87846 miles (1753.665/0.3472) in an average petrol car and equivalent to travelling to Glasgow and back 6 times

Rest of Specialties Carbon Savings

- May 2022 to April 2023 = 1674 consultations (30-35 min consultations)
- Assuming that the 5.50Kg CO₂e for a dental consultation is representative of the general group for all specialties then the savings from not performing a dental examination in clinic would be 1674 x 5.50 = 9207Kg CO₂e
- The proportions of remote consultations for the rest of the specialties are approximately 20:80 virtual:telephone = 335:1339
- 335 x 0.06 = 20.1 kg CO₂e virtual consultation



- $1339 \times 0.1 = 133.9$ kg CO₂e phone consultation
- Total = 154 kg CO₂e remote consultations all other dental specialties
- $9207 - 154 = 9053$ kg CO₂e saved for all other specialties from remote consultations per year and is equivalent to travelling 26,074 miles (9053/0.3472) in an average petrol car & equivalent to travelling to Glasgow and back 32 times

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