An evaluation of referrer factors for 98,671 referrals made to the West Yorkshire Oral Surgery Managed Clinical Network over a 3 year period.

Richard J Moore*, Division of Oral Surgery & Oral Medicine, The University of Leeds, UK
Iain Pretty, School of Dentistry, The University of Manchester, UK
Gail Douglas, Department of Dental Public Health, The University of Leeds Dental School, UK
Alan J Mighell, Division of Oral Surgery & Oral Medicine, The University of Leeds, UK

Brief Points

- Describes referrals for a tri-specialty MCN over 36 months with insight into the service demand for Oral Surgery, Oral Medicine and Maxillofaical Surgery in West Yorkshire, and highlights referral behaviours showing that 60% of all referrals are accounted for by 10% of referrers.
- Oral Surgery referrals accounted for over 75% of all referrals of which the majority were exodontia. Almost 20% of all referrals were in the 'other' category.
- Highlights the need for further studies both of a quantitative and qualitative nature to better understand referrer behaviours and how these impact on future service design and workforce training.

*corresponding author
r.moore2@leeds.ac.uk

Abstract

Introduction: Patients referred from primary dental care to hospital-based specialists in high volumes can contribute to significant NHS service pressures. Surprisingly little is understood about what contributes to referral factors.

Aims: To gain new insight into the referral factors from primary dental care by interrogating the tri-specialty West Yorkshire Managed Clinical Network referral pathway data for a 36 month period (2016-2019).

Methods: Anonymised referrals from the electronic referral management system were collated for analyses.

Results: There were 98,671 referrals within the 36 month period, 13% of which were rejected. Of those accepted for triage 76% were directed at oral surgery, with >60% accounted for by exodontia. Ten percent of referrers accounted for 60% of all referrals. Peak referral occured 5-years after GDC registration

Discussion: This is the first report of referral data from a tri-specialty Managed Clinical Network with exodontia referrals predominating. The data set demonstrates variation in referrer behvaiours despite referral guidance. Referrals should be based upon patient need but patterns observed in this study suggested possible associations with high and low referral pattens which warrant further research.

Conclusions: Interogation of the referral database suggests that there are interesting patterns of referral which may be associated with characteristics of the referrer as well as their patients' needs. Further investigation could inform improved processes and service design, as well as education delivery and workforce development.

Key Words:
Managed clinical networks
Referral volume
Referrer behaviour
Workforce development
Electronic referral management systems

INTRODUCTION

The referral of patients from primary dental care to hospital-based specialists is a long established model in the UK. Over time referral numbers grew exposing the limitations of a demand-driven approach within increasing pressure on NHS resources. To help meet this challenge. the NHS England 'Five Year Forward View' (2014)(1) set the policy for introduction of Managed Clinical Networks (MCNs). MCNs are an established healthcare model that aim to provide care in a timely fashion at an appropriate location that is delivered by the most suitable professional in the networked area (2). In brief, there is greater flexibility in how care is provided compared to the established model of primary care dental team referral directly to hospital specialists, with attendant advantages for patients and NHS services.

NHS England went on to publish the 2015 Commissioning Guide for Oral Medicine (OM) and Oral Surgery (OS) (3) to support NHS commissioners to offer a "*consistent and coherent approach*" to commissioning services, for example in OS, across 3 levels of care within an MCN approach. Levels 1 and 3 reflect care delivered by general practitioners and specialist/consultant led services (3a and 3b), respectively. Level 2 care is delivered by dentists with skills over-and-above those expected of a general dental practitioner who are working within a networked approach that incudes patient pathways. The levels of care are not tied to the setting of the provider and may include primary care or hospital settings.

The introduction in England in 2004 of NHS Choose and Book System(4), an electronic referral management system (eRMS) for General Medical Practitioners to refer to specialist medical services, ended the traditional paper letter referral in that area of healthcare. It empowered patient choice over service location and gave the referrer more autonomy(5). eRMS has been associated with a reduction in inappropriate referrals, waiting times and duplicate referrals (5). In addition, patient satisfaction increased. This represented a step change with subsequent eRMSreferral development, in part informed by the data that digitalisation generated.

By contrast, dentistry largely continued with a paper-based referral process. However there has been an increasing switch to eRMS in Dentistry over recent years, but the pace, prioritisation and system choice has been in response to local or regional drivers that contrasts with the NHS e-Referral system used universally across England by General Medical Practitioners. This difference is due to the central funding of GP IT systems, whereas other primary care providers, including dentists, were not included in this NHS funding.

Provision of care that falls within the scope of OS, Oral & Maxillofacial Surgery (OMFS) or OM varies across the UK, reflecting how local services have developed over time. These areas of clinical practice collectively account for the majority of all referrals made by the dental team, yet surprisingly little is understood about referrer factors. New insight has the potential to inform improved processes and service design, as well as education delivery and workforce development.

The West Yorkshire oral surgery MCN (WYOS-MCN) established in October 2016 has a geographical footprint that is home to 1.3 million people. Given the overlap in clinical practice between OS, OMFS and OM, the WYOS-MCN established a referral form for each one, but manages these though a single e-RMS. The aim of this study is to gain insight in to the referral factors which are contributory to the pathway, by interrogation of the WYOS-MCN referral pathway data for a 36-month period (2016-2019).

MATERIALS & METHODS

Referral System

All referrals for the WYOS pathway since its inception on 1st October 2016 have been made through a single eRMS, which is summarised in Figure 1 and additionally by Montgomery-Cranny *et al* 2017(6).

Figure 1 – Overview of the WYOS pathway.

Potential referrers are required to make decisions that are informed by referral guides and related documentation to promote best use of the processes. Clear direction is given that suspected cancer referrals should be referred via the 2 week wait pathway and not via this eRMS. Within the WYOS pathway referrers are required to choose one of 3 referral forms; OS, OMFS or OS (appendix 1-3). Each referral form includes a structured approach for the clinical focus of the referral and designed to acquire a minimum data set through the use of mandatory questions. Each referral form includes an 'other' category for conditions that do not fit one of the named categories. As part of the referral process, the referrer in liaison with the patient is asked to select a preferred provider with choice informed by 'nearest' or 'soonest' options.

After receipt, each referral is checked for completeness of essential administrative details with referrals returned to the referrer if these are incomplete. Referrals that meet the required administrative standards are triaged either centrally (OS) or by the referrer selected local provider (OMFS and OM). Triage takes account of the sufficiency of clinical information to make an informed decision and appropriateness for the service in question. After central triage, allocation of accepted OS referrals to providers is determined by referrer/patient choice and capacity with in the overall MCN. It is important to note that the choice of referral form does not determine the provider. For example, care that follows a referral made on an OS form is often provided by OMFS.

Referral Data

Referral data for the three specialties OM, OMFS and OS was acquired from the eRMS provider for the dates October 2016 to September 2019 inclusive. Agreement was sought from the Commissioners and WYOS MCN. Ethical approval was not required as this is a service

evaluation with secondary use of data as stated by the Information Commissioners Office (ICO). There were no patient identifiable data within the spreadsheet. These data were exported from the eRMS into a Microsoft Excel™(Microsoft Corporation 2018) spreadsheet and cleansed into the specialty specific categories as detailed in the results section.

In addition to this, the numbers of new registrants each year was acquired from the General Dental Council (GDC) and plotted against the years since first registration of the local referrers; and referral numbers for each referrer were formatted into deciles.

RESULTS

Total number of referrals received for clinical triage over 36 consecutive months.

A total of 98,671 referrals were made through the eRMS over the 36-month study period starting 1st October 2016. (Table 1).

Table 1 – Summary of referrals received for clinical triage over the 36-month period summarised by 12 month periods and the 3 referral forms used.

Of these 12.3% (n = 12,198) were rejected at clinical triage due to reasons such as no radiographs, inappropriateness of referral and insufficient clinical details. Fluctuations in the number of referrals received per month across the 36 month study period were evident as shown in figure 2 that started in October 2016 (month 1) with the introduction of the WYOS MCN. Transient reductions are evident in August (months 11, 23 and 35) and December (months 3, 15 and 27).

Figure 2 – Referrals received for clinical triage by month over the 36-month period.

Each referral form requires information about the reason for referral within several broad categories. There was a wide distribution in the numbers of referrals made within each referral category (Table 2).

Table 2 – Cause for referral, as selected by the referrer, by 12-month period.

Distribution of Referrers by year since GDC Registration and Primary Registrable Qualification.

A total of 1800 individual referrers made a referral that was accepted for clinical triage. Of these, 3.5% (n = 63) had an invalid GDC number and accounted for 64 referrals. Consideration of the number of referrals made by years since GDC registration identified that the peak for referrals was 5 years after GDC registration and thereafter fell (Figure 3). UK graduates made 75% of all referrals with the remainder by overseas graduates.

Figure 3 – The distribution of referrers by year since GDC registration

A regression analysis was carried out on the distribution of referrers, years since first registration and referral numbers which showed no significant F-test and no significant cofficients, therefore the numbers of years since graduation is not signiciant in the referral numbers. Figure 3 shows that the numbers of WYOS MCN referrers mirrors that of the UK picture of the numbers of new dentists registered (data acquired from the GDC).

Numbers of Referrals made by Individual GDC registrants
There was wide variation in the number of referrals made by each GDC registrant with 10% of all referrers referring 60% of the total number of referrals in the 3-year period (Figure 4). The most frequent referrers (top 10% of referrers (n=180)) followed a similar distribution to the overall cohort with UK graduate registrants accounting for 77%.

Figure 4 – Numbers of referrals made by individual GDC registrants in deciles.

DISCUSSION:

Better patient access and better resource use are at the heart of the NHS England Five Year Forward View (1) and the SARS-CoV-2 virus (COVID-19) pandemic from 2020 is sharpening the focus. There are challenges associated with how routine NHS care is most effectively recovered. This aligns with the need to reduce patient visiting hospitals for care which could be delivered in other settings closer to patients' homes. The pandemic has also highlighted the importance of preparing the workforce to meet the changing oral health needs of patients and services(7).

This is the first report of an MCN with an e-RMS that collectively includes referrals made to OS, OMFS and OM specialties by the dental team. The establishment of this MCN coincided with introduction of the first eRMS in the region, and provides powerful opportunities to inform planned changes to service design and educational development of the workforce with the goal of improving patient care. The eRMS is used by primary care dental referrers and referrals from others, such as General Medical Practice teams and hospital-based specialists, come via other routes. Accordingly, the data presented is representative of the vast majority of all referrals received, but not all.

Referral categories in the 3 referral forms used, bring insight into service demand. This is of benefit for referral categories with high and low referral numbers. Numbers are small for some categories such as facial deformity and facial pain, the care pathways are multi-disciplinary. Duplication of complex services needs to be avoided and it is important that patients are able to access these services in a timely manner. By contrast, care for referral categories with high numbers is delivered by multiple providers who should be delivering care to agreed, minimum standards and shared quality assurance processes. Exodontia in one form or another accounted for over 60% of all referrals and is likely to be an underestimation given the greater than expected use of the 'other' category. This is consistent with past reports that have highlighted the high referral numbers for level 2 or 3 OS including the GIRFT report for OMFS(8).

The findings of this study indicate a need to review the referral guidelines and referral categories, as well as how these are used by referrers to ensure there is clarity over which referral form and referral category should be selected. The number of referrals rejected at clinical triage was high at 12.3% and creates additional work and patient care delays. A further driver for change is evident from the choice of 'other' for all specialties and the rise in its use over the 3-year period. Without further qualitative analyses the appropriateness of such referrals cannot be assessed. It would suggest that either referrals do not fulfil the criteria for the specified categories or there is scope for more proactive feedback to referrers to limit the use of 'other'. 'Other' category referrals dilute the value of a referral category approach and are a regression to the past paper letter referral approach. The use of 'open text' boxes on referrals provides an opportunity for additional information, but only once a specific referral criteria has been chosen.

The variation in referral numbers by year since GDC registration is striking and 60% of all referrals are accounted for by 10% of referrers. Within the top 10% there appears to be no immediate correlation in the years since GDC registration and number of referrals, with 77% (n=138) of the top 10% of referrers (n=180) being UK graduates. Overall, the percentage of referrers with a UK primary dental qualification was similar (75%) to the 2019 GDC data for all registered dentists (72%) (9). A small number of referrals could not be linked to a GDC number, but were otherwise valid. These did not have a meaningful impact on data interpretation. Therefore, in this study referral numbers do not correlate with an 'early years' referrer or overseas graduates. It is important to note that it is not years since graduation and the data must be interpreted accordingly, particularly for overseas registrants who may have worked for many years before registering to work in the UK.

This study includes the largest number of referrals reported for dentistry with recognition that not all referrers would have been working for the whole 3-year period and some findings may represent chance. The medical literature reveals a mathematical model which calculates the amount of variation in the rates of referral is likely to be caused by chance alone(10). Although this model is applicable to General Medical Practitioners, the larger size of their referral base compared to that investigated here limits its utility here. The heterogeneity of the data presented contrasts with that of Coulthard(11) who reported that 96% of a sample of 400 GDPs in one city referred up to 10 patients per month for OS care. In this study there is a subgroup of referrers who make high numbers of referrals. This group is of particular interest for further investigation to understand the reasons why. The reasons for this diversity of referral behaviour are likely to be multifactorial reflecting factors linked to the individual registrant, the running of the practice, location of practice and patient-related factors. However, it is important not to draw unfounded conclusions that their referral patterns are inappropriate. By contrast, some GDC registrants make very few referrals and it is reasonable to question the reasons for this also.

The reasons for the high service demand for exodontia in this referral series need to be better understood. There is a body of published work that explores the self-reported confidence of registrants and included reports that new foundation trainees have low confidence levels with regards to oral surgery(12, 13). There has been a related focus on the undergraduate and dental foundation training in OS and whether this is sufficient. It might be expected that referral numbers would peak in the years immediately following completion of Foundation Training one year after first GDC registration for UK graduates. This is not the case in this large series and the peak at 5-years post GDC registration and the subsequent gradual reduction cannot be currently clearly explained. It is probable that the underlying reasons are multi-factorial and care has to be taken not assume that this can be attributed to variations in undergraduate and early career experiences over time. It has been reported that postgraduate training in OS, either as a short course or recognised post-graduate training programme is a factor contributing to referral behaviours in OS(11).

The data presented illustrate the value of collectively managing referrals made on OS, OMFS and OM electronic referral forms and how these link to the care provider. Furthermore, it highlights the potential for this to be strengthened by further developing resources and processes to support choice about selection of referral categories, alongside additional patient pathway development.

CONCLUSIONS

In conclusion, this study highlights the potential for 3-specialty e-RMS data to inform future provision of patient care through improved processes, service design and workforce development. However, further qualitative and quantitative investigation of this data is required. In particular, there is a need to better understand the referral factors which contribute to such high OS referrals of which the majority are exodontia.

Author Contributions
Main author is Richard Moore, with equal contributions from Gail Douglas and Iain Pretty. Alan Mighell is the supervising and advisory author for the group.

References

1.   England N. Five Year Forward View 2014 [Available from: https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf.
2.   Skipper M. Managed clinical networks. Br Dent J. 2010;209(5):241-2.
3.   England N. Guide for Commissioning Oral Surgery and Oral Medicine Specialties. 2015.
4.   Walford S. Choose and Book. Clin Med (Lond). 2006;6(5):473-6.
5.   Goldthorpe J, Walsh T, Tickle M, Birch S, Hill H, Sanders C, et al. Health Services and Delivery Research. An evaluation of a referral management and triage system for oral surgery referrals from primary care dentists: a mixed-methods study. Southampton (UK): NIHR Journals Library
Copyright © Queen's Printer and Controller of HMSO 2018. This work was produced by Goldthorpe et al. under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and

Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.; 2018.

6.   Montgomery-Cranny J, Edmondson M, Reid J, Eapen-Simon S, Hegarty AM, Mighell AJ. Development of a managed clinical network in oral medicine. Br Dent J. 2017;223(9):719-25.

7.   England HE. Advancing Dental Care Review 2019 [Available from: https://www.hee.nhs.uk/our-work/advancing-dental-care.

8.   Fullarton M, Martin I, Begley A, Magennis P. Getting It Right First Time (GIRFT) - the Oral & Maxillofacial Surgery Report: what happens next? Br J Oral Maxillofac Surg. 2019;57(5):393-4.

9.   Council GD. Annual Report and Accounts 2019. 2019.

10.   Moore AT, Roland MO. How much variation in referral rates among general practitioners is due to chance? Bmj. 1989;298(6672):500-2.

11.   Coulthard P, Kazakou I, Koron R, Worthington HV. Referral patterns and the referral system for oral surgery care. Part 1: General dental practitioner referral patterns. Br Dent J. 2000;188(3):142-5.

12.   Patel J, Fox K, Grieveson B, Youngson CC. Undergraduate training as preparation for vocational training in England: a survey of vocational dental practitioners' and their trainers' views. Br Dent J. 2006;Suppl:9-15.

13.   Brown J, Baker R, Moore R. An investigation into the oral surgery curriculum and undergraduate experience in a sample of DFT's in the UK. Eur J Dent Educ. 2020.