



Department
of Health

NHS dental contract pilots – Learning after first two years of piloting

The second report from the dental contract pilots evidence and
learning reference group

February 2014

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NHS dental contract pilots – Learning after first two years of piloting

The second report from the dental contract pilots evidence and learning reference group

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Version 4.0

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Glossary

BPE – Basic Periodontal Examination - A simple and rapid screening tool that is used to indicate the level of any further examination needed with respect to potential periodontal disease and provides basic guidance on treatment need.

DQOF – Dental Quality and Outcomes Framework - Quality and outcome measures used in the pilots. The DQOF measures are currently based around the domains of patient safety, clinical outcomes and patient experience. Adjustments may be made to remuneration in the pilots based on DQOF performance.

EDDNs – Extended Duty Dental Nurses

ICs – Interim Care appointments - Appointments where preventative care is provided as part of the pilot care pathway approach. The preventative care may be preventive advice (such as advice on teeth brushing and oral hygiene) or preventive advice and treatment (such as a scale and polish or fluoride varnish).

NICE - National Institute for Health and Care Excellence – The body that provides national guidance and advice on improving health and social care.

NHS BSA – NHS Business Service Authority - The body whose Dental Services division centrally processes NHS dentistry data.

OHA – Oral Health Assessment - A comprehensive assessment of a patient's oral health and medical and lifestyle factors that will impact the risk of disease in the future. This occurs for patients at the beginning of the care pathway approach.

OHR – Oral Health Reviews – The term used for subsequent assessments of a patient's oral health and medical and lifestyle factors following their initial OHA.

RAG – Red/Amber/Green – Classification used to advise patients of their oral health risk status following OHA/OHRs.

1. Introduction

This is the second report to present learning from the NHS dental contract pilots which commenced in July-September 2011. This report should be read alongside the first report published in October 2012.

The NHS dental contract pilots are exploring how we can shift the focus of NHS dentistry towards prevention and oral health rather than focusing primarily on treatment and repair. They are seeking to achieve this through two related mechanisms:

- Introducing a new clinical pathway based on managing risk, creating a healthy oral environment through providing preventive care and encouraging healthy behaviours
- Supporting the pathway by exploring new remuneration models where dental practices would be remunerated based on the number of patients they care for, and the quality of that care, rather than simply the number of treatments of different types provided.

The first report focused on practitioner and patient views on the new clinical pathway being tested in the pilots. It identified a set of *a priori* questions for short and long term evaluation and a number of these were addressed.

This second report uses data collected over two years of piloting. It focuses on the following questions:

- Have practices made an impact on risk and disease?
- Have practices met the treatment needs of their patients?
- How have dentists adapted to the clinical operation of the pathway, including the use of software?
- How have practices adapted to the pilot in the way they manage the business and their clinical responsibility?

These detailed questions have been set in response to evidence emerging from the pilots over the last year. Importantly, they are also designed to map to short and long term questions set out in last year's report, including whether and how dentists have made the transition, whether there is evidence for alterations in risk and behaviours, whether we are seeing a shift in emphasis that is appropriate and whether this is being done in a way that is sustainable.

The report is authored by the Dental Contract Pilots Evidence and Learning Group, an independently led group of stakeholders and experts set up to oversee the analysis and presentation of the data generated for the dental contract pilots run by the Department of Health. The membership of the group and its terms of reference can be found in Appendix 1.

2. Background to the pilots

A detailed and comprehensive background to the pilots is provided in the first evidence and learning report published in October 2012. We present here only a high level overview of the pilots for ease of reference.

Seventy NHS dental practices in England commenced as dental contract pilots between July and September 2011, all of whom continue to be pilots.

2.1 The clinical pathway being tested in the pilots

All the pilots are testing a new prevention based clinical pathway. An illustration of the care pathway for patients choosing to engage in continuing care is shown below.

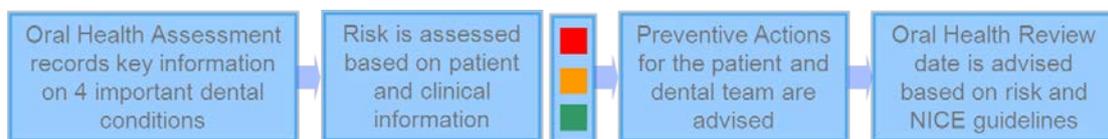


Figure 2.1 – An overview of the care pathway for patients engaging in continuing care

The care pathway as operated in the pilots begins with an oral health assessment (OHA), a comprehensive assessment of the patient's current oral health and medical and lifestyle factors that will impact the risk of disease in the future.

Informed by the OHA, the intention is that patients will be advised of their oral health risk status based on a red/amber/green (RAG) rating and given advice on what they can do to prevent disease. Patients will also be issued with a self-care plan which provides advice on what they can do to maintain or improve their oral health.

As well as attending follow-up appointments for any necessary treatment, where appropriate because of an identified risk, patients will also be advised to attend follow-up appointments focused on providing preventive advice (such as advice on teeth brushing and oral hygiene) or preventive advice and treatment (such as a scale and polish or fluoride varnish). These preventive care appointments are called interim care appointments (ICs).

Patients will be advised when they should return for their next oral health review (OHR) based on their risk status and NICE guidelines.

2.2. The remuneration models being applied in the pilots

For all pilot types, a small element of their remuneration is weighted based on their performance in relation to the Dental Quality and Outcomes Framework (DQOF). In the first two years of piloting it has not, however, been possible to apply the DQOF remuneration adjustments due to issues with the robustness of the clinical data on which the DQOF clinical indicators are based.

More details of the DQOF can be found in the document “Dental Quality and Outcomes Framework” published in May 2011.

Beyond the DQOF financial adjustments, there are three different pilot types where different remuneration models are being used. In all three cases pilots are no longer remunerated based on the activity measure of UDAs (Units of Dental Activity), the basis for remuneration in NHS dentistry currently. Instead the remuneration models being used seek to provide learning for a potential future remuneration model based on capitation (the number and type of people for whom care is provided). Each of the pilot types is simply testing a model thus creating a diversity of environments in which the pathway will operate in order to allow learning by comparison.

Type 1 pilots are remunerated for delivering an expected level of NHS commitments (time spent providing care for NHS patients as measured by NHS appointment time). In essence the pilots are expected to deliver the same level of NHS commitment as they were delivering prior to the pilots commencing.

The original purpose of the Type 1 pilots was to explore how many patients can be cared for when adhering to the new care pathway when any financial incentives relating to activity levels or patient numbers are removed, but see comments below about financial incentives.

Type 2 pilots are remunerated based on the number of weighted capitated patients they have, the capitation weighting for individual patients varying depending on their age, gender and the deprivation status of their home postcode. For Type 2 pilots, the capitation payment relates to all care – preventive care, routine treatment and complex treatment.

The purpose of the Type 2 pilots is to explore the impact of applying a remuneration model based on weighted capitation where remuneration is adjusted based on a patient’s demographic details (with remuneration intended to compensate for the average cost of care for an individual in that patient cohort) and remuneration is effectively dependent on the number of patients for whom care is provided.

Type 3 pilots are also remunerated based on their number of weighted capitated patients. For Type 3 pilots, however, the capitation payment relates to preventive care and routine treatment only. The element of a Type 3 pilot’s contract value associated with complex care (generally “band 3” treatments requiring laboratory work) is fixed and guaranteed and not subject to any adjustment associated with capitation.

The purpose of the Type 3 pilots, like Type 2 pilots, is to explore the impact of applying a remuneration model based on weighted capitation. The aim of the Type 3 pilots is to also explore the impact of separating out the remuneration for complex care.

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Of the 70 original pilots, 46 are Type 1 pilots, 12 are Type 2 pilots and 12 are Type 3 pilots. Practices whose contract values (and commissioned levels of activity) had been stable for the three years prior to pilots starting were selected as Type 2 and Type 3 pilots. This meant we would have expected their capitated patient list numbers to be stable when the pilots started.

The Type 3 pilots selected were those whose contract value associated with non-complex care was closest to the remuneration that would have been applicable if the national weighted capitation values were applied to their patient lists. Further details of the pilot selection process were included in the first evidence and learning report.

A further 24 NHS dental practices in England joined the pilot programme in April 2013 as Type 2 and Type 3 pilots with pilot type being allocated randomly. Two or three salaried services are also in the process of joining the pilot programme. The new pilot practices and salaried services are not covered in this report as data that can be used for evaluation will take some time to emerge.

2.3 Financial incentives in the pilots

The pilots can test the operation of the pathway fairly extensively but there are aspects of the financial model which are very difficult or impossible to evaluate. In an environment where these reimbursement arrangements were operated across the service there could potentially be a mechanism enabling practices to compete for patients and the resource they bring, tending to increase the opportunities for patients to access services and allowing them to choose on the basis of the quality of the practice. However, in the pilots it was not feasible to alter the practice contract income because, in order to introduce the pathways and software, which was always likely to be a difficult and time-consuming process, it was important to provide a financially stable environment for practices. For that reason, whilst the different pilot contract models will be informative by comparison and will give some indication of what we might achieve in a real market, it is impossible to model precisely how practices would respond to potential market incentives such as the need to maintain a patient list size or even to grow a practice. Similarly, a reduction in patient list size in the pilots does not meet with major financial consequences so there was no direct financial incentive in the pilots to maintain patient list sizes. In addition, structural changes to the way a practice operates, for example changing skill mix may also have been seen as financially risky without the certainty of longer term contractual arrangements, so some of the bold steps that a practice may wish to take to aid efficiency in the new environment will likely have been avoided.

3. A summary of the findings from the first evidence and learning report

The first report focused on practitioner and patient views on the new clinical pathway being tested in the pilots. Both practitioners and patients strongly supported the preventive care based pathway approach.

The report's summary of the main questions considered is presented below for ease of reference. These are the words used at the time, back in October 2012.

3.1. Whether dentists were able to make the transition to the new pathway

The transition was made and practices survived, but there was a temporary change in practice that had major impacts within the practices over several months, particularly early in the process. The time taken for the OHA at the first stage in the pathway was considerable, but reduced with time as did the proportion of OHA appointments. These changes were expected and provide important learning for any future implementation. It has taken a year to see the balance of activities starting to settle down so we are only now approaching a point of steady state where it may be possible to evaluate the sorts of services that are delivered.

There has been an impact on access which is not unexpected but does need to be addressed. Some of this will be related to the additional time resulting from transition, but there is also some evidence of a background effect which may affect access even in steady state. Whilst the scale of this will need to be investigated, it looks likely that, as expected, the pathway model, as it stands, takes longer to operate, per patient, than the previous model. For the pilot process, the OHA, the risk algorithms and the pathway were set to cover every risk eventuality. Only by running this live is it possible to identify where efficiencies can be made (for example, by reducing the mandatory domains for data collection in some patient groups).

The process of streamlining the pathway to make it quicker and easier to operate without losing the very clear value which is demonstrated in the response from patients and dentists is now well underway and there is considerable capacity for such streamlining. This is a critical step in the pilot process.

3.2 Whether disease risk is consistently captured and communicated for patients

This has clearly happened and RAG ratings are being generated. The distribution of the ratings is broadly as one might expect from the epidemiology, particularly for those at greatest risk. There are some anomalies around the boundaries of the amber ratings which would be worthy of investigation further as part of the pathway review. However, risk is being measured and appears to be appropriate. Whilst not all patients recall being advised of their RAG status, those that do are very positive about how helpful this is in understanding the health of their teeth and gums.

3.3. Whether disease risk is managed through a pathway

There also appears to be evidence that this is happening. At this stage we cannot show whether risks are reducing, but it is possible to see that interim care appointments are happening across the board as they should, though with some variation.

3.4 To what extent patients approve of the new arrangements

The patients who responded to an extensive survey clearly were very positive about the change, they received care plans (though not always) and responded well to the advice they were given, at least insofar as they were receptive to the information provided. Whilst we do not know how well retained or effective the care plans are yet, they are definitely being received and acted upon. There is now some work to do around the presentation of the care plans and a need to investigate why some people did not recall receiving them. It is unreasonable to expect every patient to be universally enthusiastic about a service, but the data from patients are very encouraging.

3.5 Whether the new arrangements make clinical sense to dentists and the dental team

There is also clear evidence that this is the case; the dental teams felt the pathways made professional sense. However, further work to look at different professional groups and practices may be advisable. The arrangements will have been operated in different ways in different places, perhaps sometimes more effectively or efficiently than others. Whilst the pathway model was very popular, there were some areas where clear differences between respondents were evident, for example the utility of ICs and the issuing of care plans. These are important areas to follow up as part of the pathway review.

4. The questions explored in this report

In last year's report we set some a priori questions that we would seek to address across the course of the programme.

The report starts with some programme level findings based on pooled data from across the programme, limited to the 70 practices that started in 2011. The 2013 recruits are too early in the process to be providing meaningful information. However, it has become clear as data have been analysed that average data from 70 practices often masks enormous variation and much of the most valuable learning will come from understanding that variation. Therefore, where appropriate, we have made data available at practice level to show the variation (data are anonymised in all cases). Much of the data at this level are presented in appendices to the main report as there is a considerable amount of material.

In this environment of variation, a conventional statistical approach built around averages derived from all practices was not going to be particularly helpful if we were to understand how the pilot practices were operating. A much more personalised and qualitative approach was necessary to understand what is working with whom, and why.

Having examined the programme level data and following discussions with the programme team, the Evidence and Learning Reference Group therefore suggested additional approaches to further an understanding of how key elements of the programme are operating, of how the pilot arrangements may affect the way dentists offer their services and of the way patients use them. The additional pieces of work are based on the following four overarching questions:

- Have practices made an impact on risk and disease? (Section 7)
- Have practices met the treatment needs of their patients? (Section 8)
- How have dentists adapted to the clinical operation of the pathway, including the use of software? (Section 9)
- How have practices adapted to the pilot in the way they manage the business and their clinical responsibility? (Section 10)

These questions map to a large proportion of the a priori programme questions set in October 2012 including the following:

- Whether disease risk is managed through the pathway (Sections 7, 8)
- Whether the new arrangements make clinical sense to the dentist and the team (Sections 9,10)
- Whether care is delivered at a cost that is sustainable (Sections 6, 9, 10)
- Whether dentists are able to make the transition (Sections 9, 10)
- To what extent there is evidence of a pattern of care which is appropriate to patients' risks and health needs at an individual level (Sections 7,8, 9)
- Whether the incentives that emerge for patients and dentists promote health (Section 7)

- Whether risks show some measurable evidence of a net reduction across practice populations (Section 7)
- To what extent there is better or worse oral health for patients from all societies who use the service (Section 8)
- Whether the emphasis for care moves from operative to preventive in a way that is appropriate for patients (Sections 7, 8).

These questions may not all be answered fully, but the data reported allow them to be addressed in a meaningful way.

The additional projects built on detailed analysis of the programme data, from feedback collected as part of the ongoing dialogue with practices, and also on each other. For example, the work reported in Section 10 was informed by the data from Sections 6 and 9. In Section 11 we try to look across the body of evidence and identify priorities for the next phase of the programme.

5. Data issues and developments

The process of piloting has provided numerous learning points with regard to how to establish reliable data systems that are suitable for contract and performance management. Pilot practices have been required to use versions of chair-side IT software that has been specifically designed by their individual software suppliers to meet the needs of the piloting programme. A specification was developed based on these needs by the programme and made available to the software suppliers. The NHS Business Services Authority (NHS BSA) has also built new systems that capture, analyse and report this information such as to support contract management and learning from the pilots.

The specification of data requirements included detailed data on every patient appointment including tooth surface level dentition charting. The number of data fields required from the pilot software was many times greater than that required in the FP17 form – the form which is currently provided by NHS dental practices holding GDP contracts. The rationale for the additional data requirements at the time was to support learning from the pilots: it was considered important to be able to monitor patient pathways to the level of individual appointments to understand how the care pathway was being implemented. In addition, a full tooth-surface level dentition charting was considered to be the best way to get accurate data on disease prevalence and treatment provided. It was also considered a potential option that these data would be required in the new contract.

However, having collected data at this level of detail the programme has been able to understand much better the consequences of data collection at different levels. While such detailed data might provide good insights, the level of data requirements have come at a considerable cost, in terms of:

- increasing practice time spent on inputting data
- muddying the message of what the care pathway is actually trying to achieve
- poorer data quality as a result of creating an overly complex system

For these reasons, the programme has subsequently greatly simplified the data requirements for the next version of the software. But in the meantime the programme has had to deal with the challenge of getting the best quality data possible with the existing systems. A range of activities have been used to identify data quality issues including:

- The programme has commissioned an end-to-end audit looking at the transmission and processing of pilot data
- The programme has a dedicated analyst team who have led on identifying and resolving data quality issues
- Pilot practices have had a role in identifying data quality issues by feeding back on the management information they receive.

The data issues have fallen into three areas and each is resolved in a different manner:

(i) Issues with data entry – these issues have a variety of causes and many have proved very difficult to resolve. Training and communication with pilot practices have a large role in

improving the quality of data entry and significant efforts have been put into this. The programme has also come to recognise the potential role of incentives (financial or performance management incentives) in improving data quality. For example, a new performance management report is now available to practices with some indicators on data quality. It is still early days to say whether this will drive up data completeness.

(ii) Issues with chair-side IT– these are managed through weekly calls with software suppliers. Any issues are rectified as quickly as possible but some issues have a long development lead time to resolve.

(iii) Issues with data processing – i.e. the handling and processing of data in NHS BSA. When identified these can be quickly rectified by the dedicated team working on the new contract pilot data.

Figure 5.1 shows the flow of data and identifies the points where errors can occur.

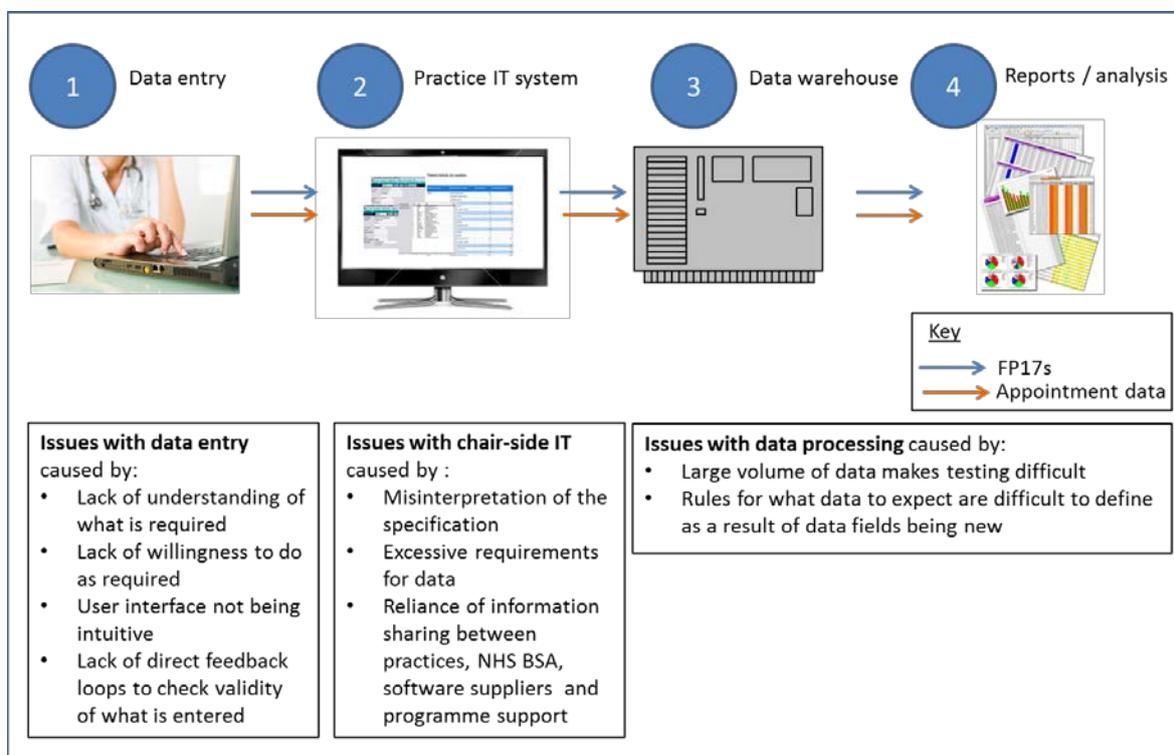


Figure 5.1 – Flow of data in pilot system

5.1 Presentation of data for this report

Poor quality data can be very misleading and can be more of a problem than having no data at all. The Evidence and Learning Group approach to publication of data in this report has been that only data that is believed to be robust and of high quality is included. Where there is sufficient doubt about the integrity of the data, such material has been excluded.

5.1.1. Accuracy of data on patient numbers and access

Pilot practices are required to transmit two data sets: (a) appointment level data for every NHS patient appointment within 5 days of the appointment occurring and (b) FP17 forms at the end of every course of treatment with a 2 month tolerance (as under other GDS contracts). This has

proved to be a very significant challenge, and whilst good progress has been made, it is still the case that many practices do not transmit all appointment data on time and many FP17s are open which should technically be closed. As a result, the programme underwent an exercise aimed at ensuring that there was no appointment data in practice systems that hadn't been transmitted to the NHS BSA up to 31 March 2013. As a result, the programme is broadly confident that appointment data up to 31 March 2013 is complete. This drives the capitation engine and hence financial year-end adjustments; so it was imperative to ensure this was correct. However, the programme is not confident that all FP17s were closed and transmitted when they should have been, or that appointment data post 31 March 2013 is complete. Therefore, the data presented here only covers up to 31 March 2013 and does not include any FP17 data.

5.1.2 Accuracy of patient identifier

The pilot system generates a unique patient identifier based on the patient's name and date of birth (DOB) as entered into the dental software systems. A superior option would have been to use NHS patient number (which is a genuinely unique patient identifier) but this had practical limitations and it has not been feasible to use for the pilots to date. There are limitations in the current patient unique identifier in that:

- If a practice enters an existing patient's name and DOB with any variation from the details held on the system (such as misspelling the patient's name) the system will handle the new details as if they are referring to a new patient
- If there are two individuals with the same first initial, surname and date of birth, the system will treat the data for both individuals as if they are relate to a single individual.

These inaccuracies are relatively low in frequency (estimated to account for less than 1% of a practice list) so, while they prove a challenge for some operational reporting, they are not considered to be a significant inaccuracy in the data measures presented in this report.

NHS BSA plan to start introducing the use of NHS numbers to improve patient matching from 2014. This will allow much better management of data, better contract monitoring and far more integrated care.

5.1.3. Accuracy of patient details and other appointment or course of treatment details

The programme is broadly confident that the following data items are of reasonable data quality:

- Patient characteristics: age, gender, IMD (Index of Multiple Deprivation) from postcode are available for most patients (it is only not available for the 1.4% of patients who do not have a valid English postcode)
- Outcomes from OHA/Rs: The spread of RAG statuses seem to be broadly correct
- Identifiers of appointments that are OHAs, OHRs or urgent assessments seem to be accurate.

Conversely, the programme has concerns over the accuracy of the following fields:

- Dentition charting: this is incomplete or absent from some patients' assessments and the reasons for this need to be explored further. This is discussed below.

- Appointment type category: it is not possible to distinguish appointment types between IC appointments and treatment appointments and other appointments that are not marked as an assessment.

These limitations have been taken into account in the presentation of data in this report.

5.1.4 Representation of subsets of patients in this report

There are a number of charts in this report which represent only a subset of all patients that are being treated in the pilot practices.

The following table summarises the patients that have been seen under the pilots since the piloting process began.

Total 3 year capitation list size at 31 March 2013	534,804
Total unique patients seen in pilots since pilot start	475,734
...of which have had an OHA by 31 March 2013	381,522
...of which have had at least one OHA and OHR	84,786
Percent of patients seen in pilot period with a non- valid English postcode	1.4%

Table 5.2 - Summary data on patients seen in the Wave 1 pilots

Of all patients on the pilot practices' 3-year capitation lists at 31 March 2013, 16% had had an OHA and an OHR and 55% had had an OHA but no OHR by 31 March 2013. A further 18% had been seen in the pilot period but had not had an OHA and 11% had not been seen at all at the pilot practices.

Note that Wave 2 pilot practices have not been running for a sufficient period to contribute to the data presented in this report.

5.2 Future challenge of data quality - dentist recording of data

The data received on dentition charting is for many patients, incomplete or absent. The most significant impact of this for the piloting programme has been that it has not been possible to apply the Dental Quality and Outcomes Framework (DQOF) financial adjustments for either 2011/12 or 2012/13. This is because the clinical outcomes rely on accurate clinical data currently derived from the dentition charting.

Currently in NHS dentistry there is a medico-legal requirement for practices to maintain accurate patient notes, but that does not have to be in electronic form. For the pilots it was made a requirement in regulations for the practices to keep patient records in electronic form. The evidence to date, however, suggests there have been inconsistencies in the quality of electronic data recording from practice to practice and within practices, from clinician to clinician. This is considered in more detail in Section 8. There was also at least one pilot

practice where paper and electronic records were being kept concurrently, suggesting for some there is a significant cultural challenge in the transition to electronic records. There are important lessons in this. These are that data are critically important for monitoring and development and, as accurate data are required for monitoring to be robust, there needs to be a strong driver in the contract for it to be collected with precision in the surgery as well as appropriate training and support for practices as we move to electronic recording.

6. Findings - Overview of dental pilot programme metrics

6.1 Introduction

In this section, we present a number of key metrics relating to the dental contract pilots. The data come from the programme itself using information collected centrally by the programme team. This does not include clinical data (where there were data quality concerns) but does report important material on trends with access as well as patient satisfaction.

6.2 Access

The term access can mean different things to different people. The ability for any patient to be able to access NHS dental services when they need to use them is an important starting point in any new contractual arrangement. In a system with registration, being on the registered list of patients is one very important step to ensuring access to services. A list of patients seen by the practice in the previous two years is used as the starting point in this report. With time, if that list size falls it suggests that there may be a loss of capacity in the system to see patients.

Increases in the list size are also possible, and not necessarily an indication of good practice (patients could be seen but not treated). Increases and decreases in list size indicate that practices are doing something differently and both are informative. It is change in this list size that is used here as a proxy for access.

In 2012 we identified an expected fall in access and discussed the reasons for this. One of the most important considerations and pieces of learning is to understand how a new system would need to be set up where the incentives for dentists and for patients are aligned around both good health and “good access”. The two (good health and good access) should be well aligned to each other in a capitation based system as better health means less treatment and greater opportunity for the dentists to see more patients.

There are also profound and important long term benefits in preventing disease from developing and this is probably the most compelling argument for changing the emphasis in a contract. However, if the cost and effort to prevent disease appears to be greater in the short term than simply allowing disease to develop and then trying to treat it away (without managing the risk) then we risk losing the more profound long term benefits, creating further cycles of replacement and repair. Consequently, any pathway where disease risk is actively managed through prevention needs to be delivered both efficiently and effectively. There are three reasons why we should expect a reduction in list sizes in this pilot system at this point in the process:

(i) **The introduction of a new system.** We know from data in the first year that undertaking thousands of OHAs using a new software system was slow and introduced delays. These will not disappear without considerable additional input from the practices. In Type 1 pilots, there may be a professional desire to provide a good service, but there was no financial reason to provide that extra input of time and effort to catch up. In Type 2 and 3 pilots there is capacity for a small variation (+/- 2%) but this is capped with no penalty for a greater fall and no extra

payment for a greater rise than the 2% allowed. For practices close to maintaining the list size that will certainly have been an incentive, but if list size had fallen by more than a few percent that incentive would rapidly diminish. Consequently, we are likely still to feel the echo of this for some time to come.

(ii) **The efficiency of the pathway.** If the time and effort to provide the prevention services are too great, if the algorithms that generate the risk status (which in turn generate RAG rating, recall interval and the advice on preventive care) are too sensitive, or if the way the pathway is being operated is inappropriate, access will be affected. The OHA, algorithms and advice about operating the pathways were drawn up from scratch with a view to them being streamlined as part of the pilot, so significant inefficiencies in the pathway, with an impact on access, are inevitable at this stage. Whilst changes have been made to the pathway, there has been little time for these to be effective.

(iii) **Incentives.** People, dentists included, work to incentives and will find solutions if it is in their interests to do so. If there is no carrot or stick we might expect access to drift downwards as this requires least effort and carries no cost. In this context, it is important to understand that people are very variable in terms of their motivation; some dentists with strong internal motivation in supportive practices will tend to find solutions to maintain a high level of activity even in the absence of any financial drivers to do so. See also point (i) above.

Figure 6.1 shows that the total number of unique patients seen over the 24 month period up until the named month across all pilots has continued to fall for the duration of the pilots. Note – The 24 month measure for each practice is effectively a two-year capitated patient number in that it is the number of unique patients seen by each practice in the previous 24 months that have not subsequently attended another NHS practice.



Figure 6.1 – 24 month patient numbers across all pilots

Figure 6.2 shows how the three-year capitated patient numbers have changed for the Type 2 and Type 3 pilots since the pilots started showing each pilots trajectory. Part of the selection criteria for these pilots was that they had had stable contract values for the three years leading

up to pilots starting and we would therefore have expected the patient numbers to be relatively stable without the impact of piloting. There is clearly huge variation in response. (Please note the reason the fall in patient numbers appears greater in Figure 6.1 is that the 24 month measure shown in Figure 6.1 is more responsive to a drop in patient numbers than the 36 month measure shown in Figure 6.2)

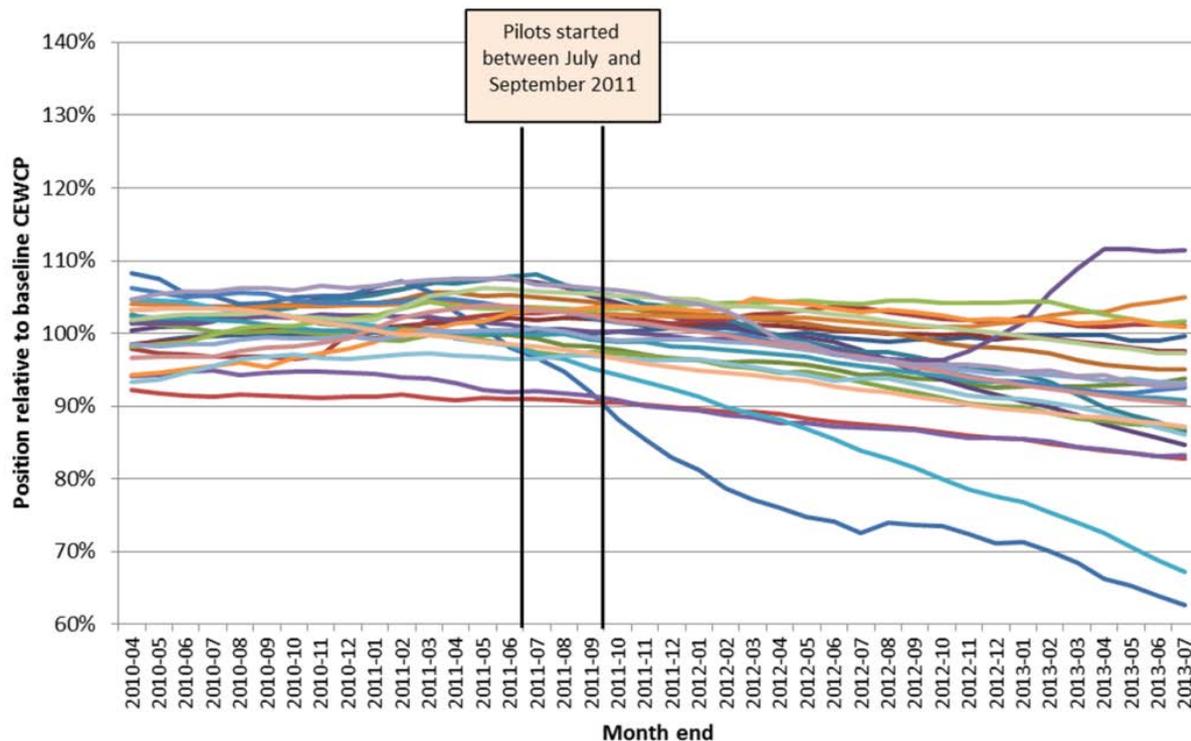


Figure 6.2 – Change in patient numbers across Type 2 and Type 3 pilots

(Note – The baseline CEWCP (Contractor's Expected Weighted Capitation Population) is effectively the average number of patients each practice needed at the start of the pilots to be remunerated 100% of their contract value)

A small number of pilots have maintained their patient numbers, one shows a sharp and sudden increase after several months of gradual reduction, but in the majority of cases patient numbers have fallen to some degree. Two practices have seen access reduce at an alarmingly steep rate, and in one of these, the fall started some six months prior to the start of the pilot. The effects of individual circumstances or decisions are evident in the variation observed here, but for the majority of practices a reduction of list sizes is apparent.

The top line data presented here represent only a fraction of the analysis. Extensive work has been undertaken to try to understand how a practice profile might affect the changes in access. A series of bivariate analyses and statistical regressions were undertaken with the expectation that one or two key independent variables would start to explain some of the variation in list sizes. This was not the case and no independent variables were detected that had any significant relationship with the changes in list size. The sample size (70 practices) is not large but the lack of any association was surprising. Further programme level data were extracted

and compared but continued to demonstrate enormous diversity and the conclusion was that there was no common factor identified, or obvious combination of factors, that would explain the variation. The situation was also quite dynamic as practices were, quite understandably, adapting their procedures over time. Routine statistical methods did not appear to be able to identify specific factors or combinations of factors that impacted the ability to maintain patient numbers. This is illustrated by the graphs presented in Appendix 2.

Two year list size has reduced in most practices, and this is not unexpected for a number of reasons, but the extent of the reduction is hugely variable. Understanding this variation is now important and a different approach was required to get a deeper understanding of why list size was changing (see Sections 9 and 10).

6.3 Recall intervals

One of the desired outcomes of the pathway approach being tested in the pilots is that patients are recalled for reviews at intervals appropriate to their clinical risk. The graphs below show how the expected recall intervals compare with actual intervals for patients with different clinical risk.

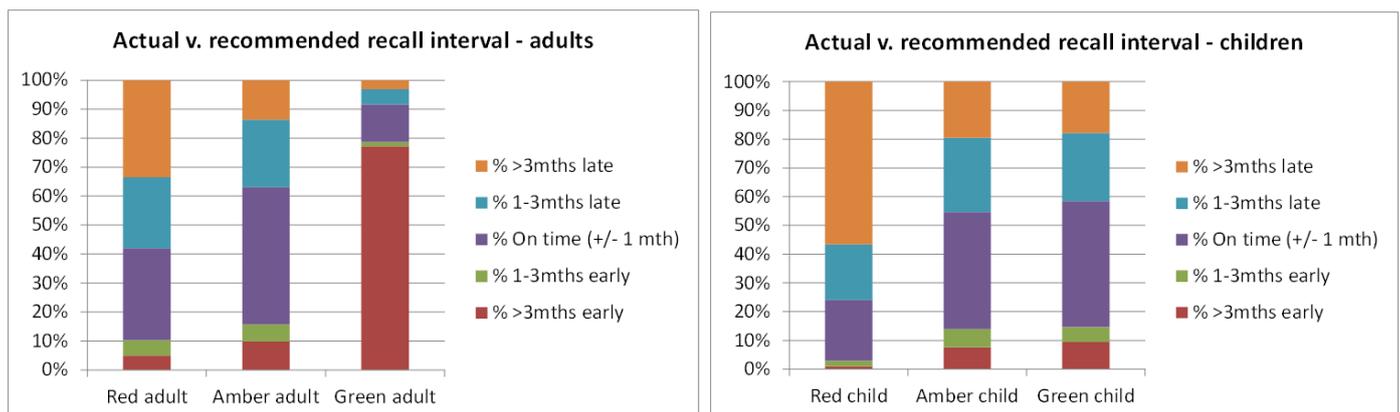


Figure 6.3 – How expected recall intervals are comparing with actual intervals

These graphs show the actual recall interval (time between OHA or OHR and subsequent OHR) compared to what was entered as the recommended recall interval at the original OHA or OHR. If the clinician over-rode the recall interval generated by the care pathway matrices, this is reflected in these charts. No adjustment is made for patients who receive treatment between assessments, even though the recall interval is often in practice meant to be measured from final treatment appointment instead of assessment.

It should be noted that these particular results are influenced by the fact that the pilot practices are still in a transitional period and have not reached “steady state”. Since the longest recommended recall interval is 2 years for Green adults, the practices would need to be running the care pathway for more than 2 years before seeing a fair representation of green adults’ recall intervals. The data above relates to all OHRs received before 31 March 2013. In this period, 16% of Green adults returned for an OHR compared to 38% of amber adults and 32% of red adults.

The data show that large numbers of “red” adults are returning for their reviews later than the expected recall interval whilst large numbers of “green” adults are returning earlier than expected. Many “red” children are also returning for reviews later than expected. In the case of “green” adults returning earlier than expected, it is important to recognise that there may be clinical reasons why individual patients are recalled earlier than the standard recall period of 24 months and clinicians may not always be using the over-ride facility in these instances to change the recall intervals on their systems.

The data does suggest that at least some dentists in the pilot may be finding it difficult to move away from the very established “six month check-up”. Given the fundamental part this has played in the remuneration system over 6 decades of NHS dentistry, perhaps this should not be a major surprise, but further work is now needed to explore the reasons for the variance between expected and actual recall intervals and how this variance can be addressed.

If we are to have a flexible and responsive service where we can maximise clinical outcomes and access to services we need to move to a point where recall intervals properly reflect clinical risk. It is also important that patients understand the reasons for the variation in recall intervals. Just as it is embedded in the professional psyche, many patients have grown up with the belief that everyone should simply attend the dentist for a review every six months, a belief and practice that is not supported by any contemporary evidence. The challenge now is changing this belief.

6.4 Patient experience

Due to the issues with clinical data quality we have described already, we are not yet able to present the performance of the pilot practices with respect to the DQOF clinical effectiveness indicators.

We are able to present the performance of the pilot practices with respect to the DQOF patient experience indicators. These indicators are based on the responses of patients to surveys issued by NHS BSA following the completion of courses of treatment. Before considering these, it is worth considering that there probably tends to be a risk of bias towards positive responses in surveys of this sort. For that reason we have compared back to national data from all practices.

Table 6.4 below shows how performance varied across practices with respect to the different patient experience indicators. The results are based on surveys issued to patient relating to courses of treatment completed in 2012/13.

Appendix 3 shows the DQOF points thresholds for the different indicators. It should be noted, however, that no DQOF financial adjustments were applied in 2011/12 or 2012/13 due to the issues with the clinical data quality on which the clinical effectiveness DQOF indicators are based.

The results suggest the experience of patients at the pilot practices is generally very positive. In all but one practice more than 90% of patients reported being satisfied with their NHS care and in all but two practices more than 90% of patients suggested they would recommend their

practice to a friend. The mean satisfaction level with NHS dentistry in the pilots of 95.8% compares favourably with the national mean for all NHS dental practices of 92.2%.

The indicator where there was greatest variance across performance related to satisfaction with the time to get an appointment. In some practices significant numbers of patients were not satisfied with the time taken to get an appointment. The mean satisfaction level in the pilots of 84.1% is slightly lower than the mean for all NHS dental practices of 87.6%. This is likely to reflect the pressure on appointment books reflected in the access figures.

Patient experience indicator	DQOF points	Min score	Mean score	Max score	Distribution of scores
Patients reporting they are able speak and eat comfortably (%)	30	85.3	96.5	100.0	85-90% - 2 practices 90-95% - 7 practices 95-100% - 59 practices
Patients satisfied with the cleanliness of the dental practice (%)	30	92.1	96.7	99.0	90-95% - 5 practices 95-100% - 65 practices
Patients satisfied with the helpfulness of practice staff (%)	30	90.5	96.6	100.0	90-95% - 11 practices 95-100% - 59 practices
Patients reporting that they felt sufficiently involved in decisions about their care (%)	50	86.4	95.3	100.0	85-90% - 4 practices 90-95% - 25 practices 95-100% - 41 practices
Patients who would recommend the dental practice to a friend (%)	100	84.5	95.7	100.0	85-90% - 2 practices 90-95% - 23 practices 95-100% - 45 practices
Patients reporting satisfaction with NHS dentistry (%)	50	87.0	95.8	98.8	85-90% - 1 practice 90-95% - 18 practices 95-100% - 51 practices
Patients satisfied with time to get an appointment (%)	10	67.0	84.1	96.7	65-70% - 5 practices 70-80% - 20 practices 80-90% - 26 practices 90-100% - 19 practices

Table 6.4 – Pilot performance against the patient experience DQOF indicators in 2012-13

7. Findings - Reducing risk and improving health

7.1 Introduction

This section looks at the clinical response to the pathway. This is not particularly easy to measure but in a number of cases we have robust data that can be examined. It investigates the impact on risk and, to some extent, on treatment. It uses the measures that are collected as part of the programme, and in the case of treatment, some very detailed data collection from within the practice.

7.2 Has RAG status of patients changed between assessment and review?

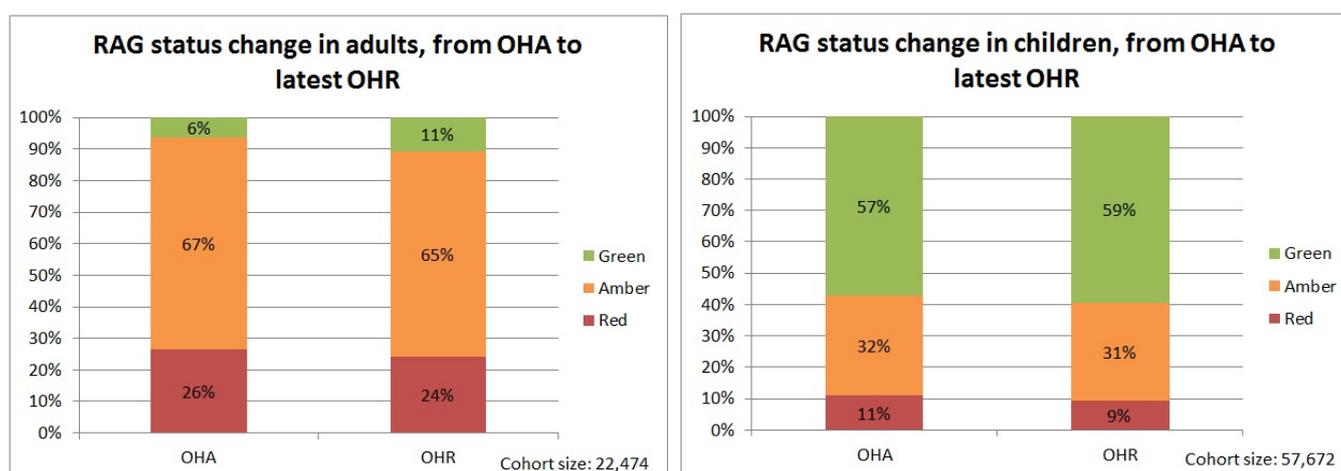


Figure 7.1 – How RAG status is changing between OHA and OHR

For all patients with an OHA in the period Sept 2011 to Mar 2012, overall RAG status was computed using the established hierarchy embedded within the software. For those patients who had returned for an OHR by Mar 2013, and where this had been recorded, their RAG status at their latest OHR was recorded. These graphs show the overall change in RAG status over this period for all patients where we have complete data to follow through.

It should be noted that there is a large proportion of patients for whom the pathway still appears to be open, in other words, there has been no OHR. There are a number of reasons why this proportion may be high and this requires further investigation. This will include some healthy patients on long recalls but may also include many other categories. Nevertheless, the comparison between OHA and OHR represents a fairly pure comparison as it allowed a single cohort (of over 22,000 adults) to be considered as they move through the system. On this basis, we might reasonably expect some level of net improvement as a response to the input of effort that is the first step of continuing care.

There has been a net shift for those where we have complete data and when we consider any risk in any domain. For adults there has been a 2% reduction in red patients and a 4% increase in the green patients. For children the changes appeared similar. There was again a net improvement with a 2% increase in green status children and a concomitant 2% reduction in red coded children. The proportion of green patients in this subset of “reviewed” patients is lower than the proportion seen at OHA across all of the pilots. This may be a reflection of longer review periods (see above).

When these data are plotted to see what had happened to the adults and children based on the starting status some quite marked switches are evident.

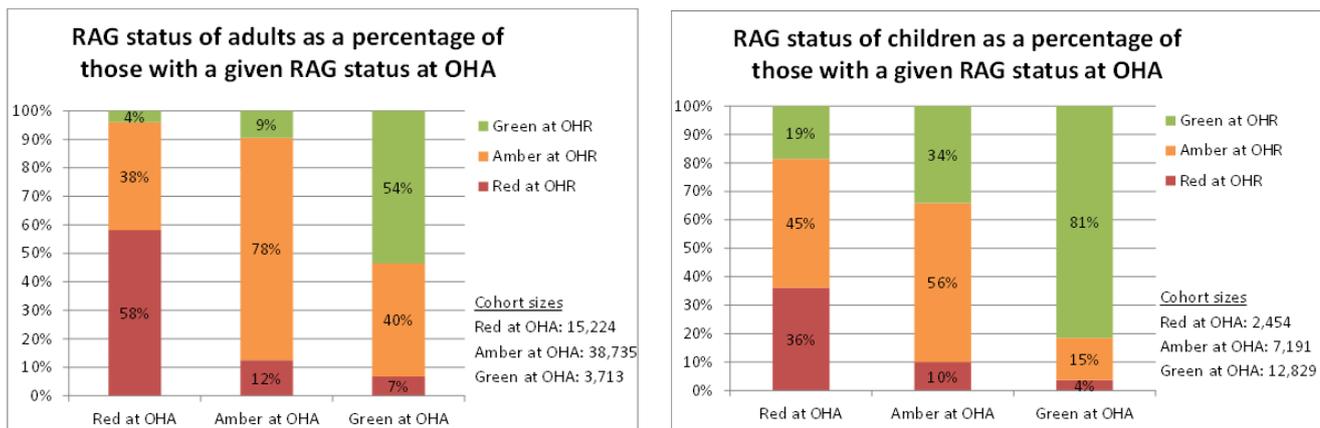


Figure 7.2 – How RAG status is changing between OHA and OHR for each RAG type

Amongst adults there was a very large conversion of red status patients to amber or green, which would be the desired change. The patients who were amber at baseline largely stayed the same with about 9% converting to green and about 12% becoming red, in the case of the latter, most likely as a result of developing a lesion of some description, reflecting their amber risk. Amongst green rated patients, most (54%) stayed green but quite a large proportion (40%) became amber with a small proportion (7%) becoming red, again, presumably with the development of a lesion.

Amongst children, those that were recorded green at OHA were very likely to have remained green at review (81%), though a few became red (4%). By contrast, there was a very clear improvement for red coded children, and only 36% remained red, the rest converting to amber or green. For the ambers there was a net overall reduction in risk with over a third (34%) becoming green but some (10%) becoming red.

Adults can have risks for caries, periodontal disease, soft tissue disease and tooth surface loss, or indeed all four as the risks overlap to some degree. Here we present caries and periodontal disease risks separately dependent on the starting risk to see to what extent the risk has been managed.

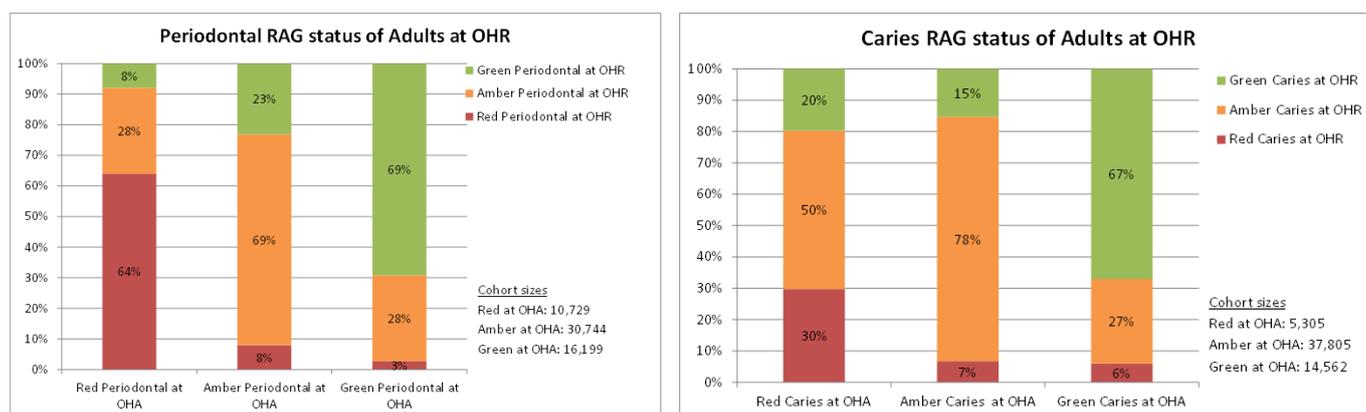


Figure 7.3 – How Periodontal and Caries RAG status is changing between OHA and OHR

For periodontal disease, the reduction in red risk is evident but modest (down to 64% red) whilst amber patients were very likely to stay amber (perhaps because some risks cannot be changed – see below) and some greens got worse. The management of periodontal risk (as measured by the pathway) has happened but does not appear to have been as great as we might have hoped. However, this may be related to the way we measure risk because later in the report the impact on periodontal status/outcome will be examined, and this indicates a considerable improvement. The relationship between periodontal risk and periodontal status is deserving of further examination and may be helpful when considering the data that informs the RAG status.

Caries risk in adults looks to have reduced markedly. Green coded patients were very likely to stay green with only 6% becoming red, and some of this may be simply as a result of differences in coding between visits. So, for patients who start green coded for caries, their prospects are quite good (and the same applies for periodontal disease). Red caries patients saw a marked reduction of risk. To some degree this reflects the treatment they are likely to have received (a successful restoration will take you out of red for caries, but periodontal treatment outcomes are not so clear cut), but the net change to amber and green is very reassuring.

7.3 Interpreting RAG status changes

It is probably sensible to view all of the previous six plots together. The first and most important finding is that there does appear to be a net shift towards lower risk. This is not huge, around 2-4% depending on which risk code we look at, but it also represents just two points in time, in all cases within a maximum of 18 months between them. What we do not know is whether this may be expected to continue to reduce across time, reverse or stabilise. We also do not know the amount of effort that is required to maintain the improvement, though one would anticipate that it ought to be less than the initial input. The purpose of continuing care (through registration and review) is to monitor and provide that top-up prevention when it is required.

What also becomes clear is that there is fair amount of flux in both directions; adults and children can get better or worse. For children who are coded green there is a fair amount of stability but their risks can increase; adults coded green appear to be rather less stable than children. Similarly, ambers can certainly improve but they can also get worse. For reds though, the most important group, the improvements are very encouraging.

Sitting behind these longitudinal observations is quite a lot of complexity. Firstly, the RAG status is a reflection of the data entered, and that may vary from OHA to OHR. Different dentists may see the patient at the two time points and they will almost certainly record what they see slightly differently. Even the same dentist may record differently on two occasions, and sometimes this will change the status. This will account for some of the background flux between codes. However, the data above (the first pair of plots) that show the net change of codes across all patients should take that “random” variation into account, assuming it is actually random across the period. Consequently, the background flux from red to amber to green and back can be largely ignored when looking at the net change.

The data based on each separate starting code do not take into account any random variation in coding and a proportion of the flux observed here may well be partly due to the background “noise”. Nevertheless, the scale of conversions of high to low risk, compared to those who started at low risk and converted to high is quite marked, particularly amongst children.

Patients who are red-coded have disease. Treatment will take them out of red. However, if their risks are not managed they will develop further lesions or, in the case of periodontal disease, fail to improve. Red reductions therefore are quite a meaningful measure of successful care. People who are coded green can only stay the same or get worse, so some will always get worse, and the fact that many do is an important reminder of the need for some level of monitoring. People coded amber, particularly adults, are a rather different proposition. In some cases the risks that make a person amber are modifiable, perhaps poor plaque control or certain dietary behaviours or smoking. Some are not, for example certain aspects of medical history (having diabetes for example). In the original version of the software the presence of sound but restored teeth also conferred a risk in the algorithm. Such risks are not modifiable by the patient and this means that some people can never change out of amber, except to go red. That may help us interpret to some degree what we see in terms of net changes, but it also raises some important issues about what the RAG rating is for.

Some dentists and patients have found the simple RAG rating useful where it has been used, particularly for patient information and motivation, others have simply ignored it. Some consideration needs to be given to the primary purpose of the RAG system as form will follow function. The algorithm may need to change slightly, depending on whether the RAG score is primarily for, patients, dentists or commissioners. This analysis has given substantial insights into several aspects of the programme.

7.4 Have periodontal disease outcomes changed, as measured by the BPE?

Because the oral health assessment collected periodontal data through the Basic Periodontal Examination (BPE) and this is an essential part of the OHA and OHR, we also have data from two time points on this measure. The BPE data at OHA and OHR are a reflection of disease prevalence and severity at two time points; they do not directly indicate risk but do indicate the outcome of the pathway. Consequently they are distinct from the RAG status which indicates a theoretical risk (taking into account disease) and so BPE scores are perhaps a better indication of the impact of the pathway on disease. The same caveats apply here about the data representing only those who were measured at two time points. Many others may have been

through a pathway but have not been formally re-measured, or if they were it is not recorded. We simply do not know about these individuals, but the sample we report here is relatively clean, in that they have completed a cycle of the pathway.

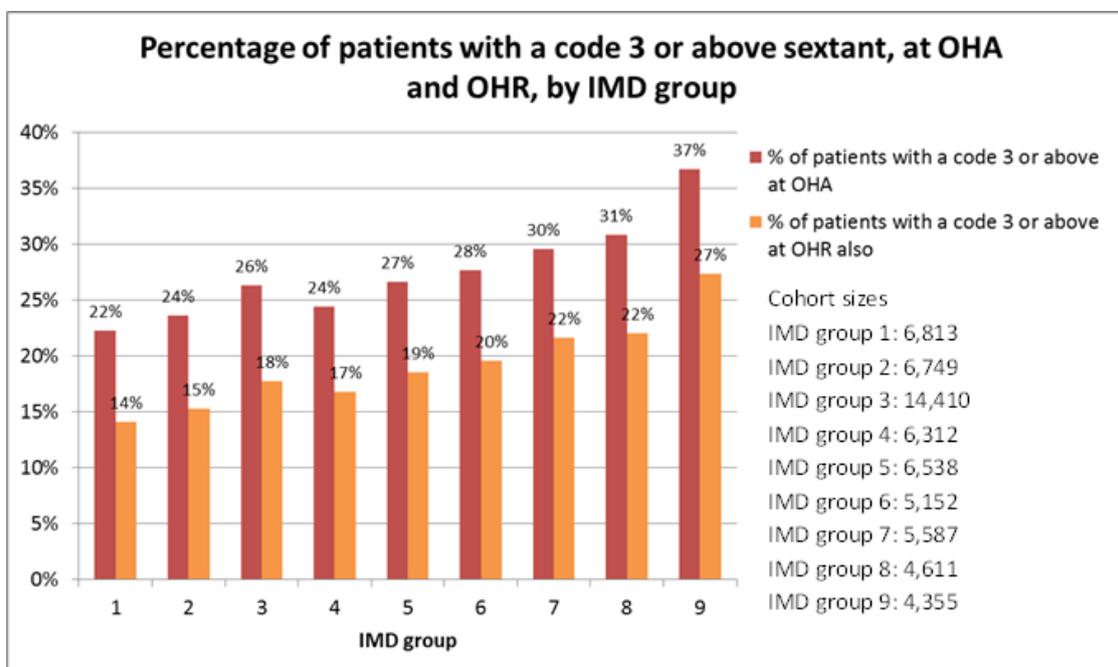


Figure 7.4 – How prevalence of BPE code 3s and above changes between OHA and OHR

Figure 7.4 shows the change in prevalence of codes 3 and above by IMD (Index of Multiple Deprivation) group of patients' home postcodes with an IMD group of 1 being the most deprived area. There is the expected shallow gradient by IMD both before and after a cycle of the pathway. While some flux is expected, if prevention and treatment are effective, one would expect a net reduction in disease. The data clearly show a very marked reduction in the prevalence of disease when measured at a level which would generally be considered moderate but clinically problematic. For each group it is a drop of between 7 and 10 percentage points between the OHA and the first OHR, so a reduction of about a third overall in the size of the group. To put this in perspective, moderate disease of this level has seen a reduction in the last decade and the whole population change in the Adult Dental Health Survey between 1998 and 2009 was of a similar magnitude, but this was over eleven years. The usual caveats have to be raised here; this is a group of attenders, it represents people who made it back for a review, the dentists were not calibrated and the intra-examiner variability is unknown. Nevertheless, there are no financial incentives to score differently at the two time points, though there may be professional satisfaction in seeing a change. This is not a clinical trial, there is no control group who did not go through the pathway and there is not reliable data from outside the pilot with which we can compare, but the data indicate the capacity for the pathway to improve health and to do it irrespective of deprivation status.

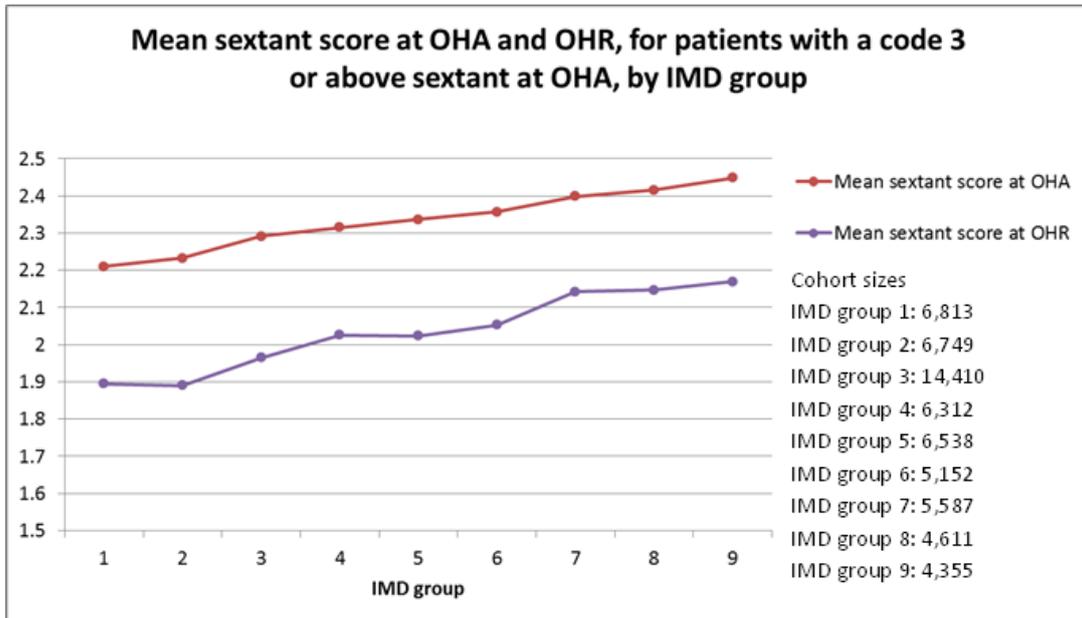


Figure 7.5 – How mean BPE sextant score is changing between OHA and OHR

Figure 7.5 represents a different way of looking at the problem. It shows a mean sextant score for the same group (those with disease) across the whole mouth. The BPE is not a continuous variable (so technically we should not really use a mean) but it is broadly ordinal (health scores low and disease scores high) so a mean is a convenient way to produce data. Removal of calculus would contribute to the reduction of the mean. It shows a consistent reduction in the mean. Figure 7.6 shows the prevalence measure by age. There is the expected age related increase in prevalence through middle age, but again, the proportional reduction in disease is experienced by all patient groups, more or less evenly.

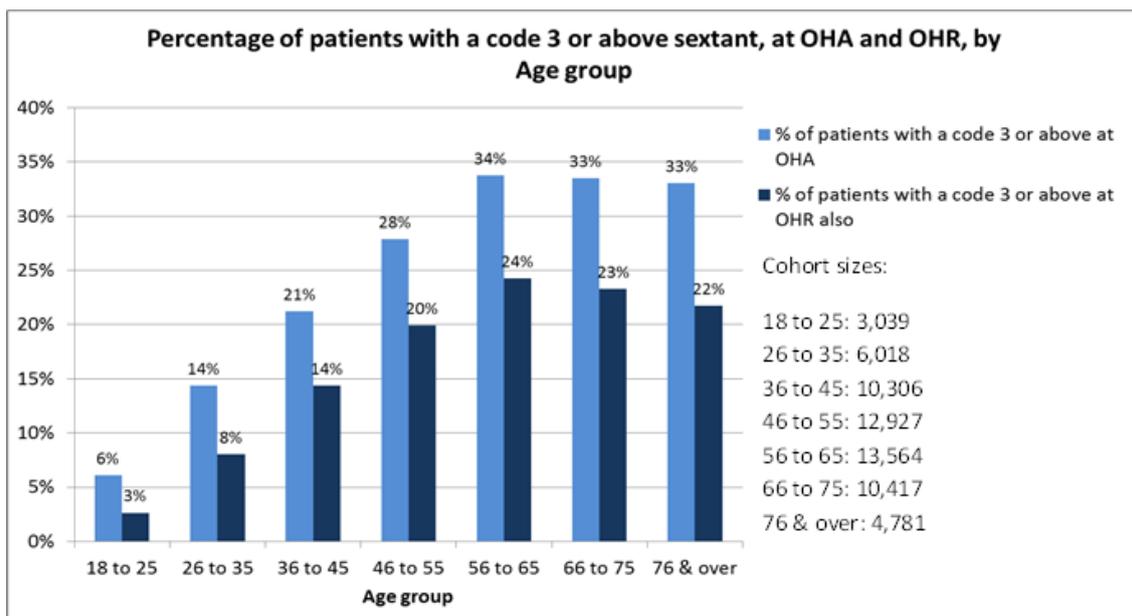


Figure 7.6 – Percentage of patients with BPE code 3s or above at OHA and OHR

7.5 Overall comments and conclusions

All of these data, RAG status and BPE, tell us whether the pathway may be capable of delivering reduced risk and improved health if it is adhered to. They clearly indicate a capacity for the pathway to deliver real health benefits in terms of risk reductions and health improvements if patients are able to go through the process. As such, it is an endorsement of the process. However, to do this on a large scale, it has to be applicable to everyone and has to be carried out appropriately by dentists. As with any health intervention, the cost of the input also has to be proportionate to the benefit and should be able to be applied universally. Understanding how the pathway is operated and managed and how it impacts on practice business therefore becomes a key consideration. These issues are picked up in Sections 9 and 10.

It would be good to repeat the approach used with the BPE for measures of caries. This is much less simple though, largely because of the way that data are collected for caries, and then the complexity of converting surfaces to teeth to mouths and the immediate impact of treatment. Our position was that the data were not sufficiently robust to do this and that there may be a better approach. The number of lesions is also dependent on treatment being provided, so treatment provision, in relation to need, was seen as a priority for analysis, particularly as there are no direct incentives to restore. The next section covers this part of the investigation.

8. Findings - Meeting need; treatment delivery

8.1 Introduction

The contract reform programme is built around a clinical pathway that can identify three clear concepts, as its starting point, each based on evidence:

- The oral health of British children and adults has seen huge changes in disease patterns and treatment strategies in the last four decades and the total volume of disease that would now be considered as needing treatment has reduced, particularly in the case of dental caries. This has left many younger adults with dentitions that are free from overt disease that needs operative treatment and free from the damage which results. It does not leave them free from the risk of disease. (Children’s Dental Health Survey 2003; Adult Dental Health Survey 2009)
- The risk of damage to the dentition from both caries and periodontal disease can be managed so that the disease processes can be reversed or prevented with appropriate health behaviours (good hygiene, a diet that is not high in sugars, an avoidance of smoking). Professionals can help to support the avoidance of disease in a number of ways and detailed, evidence-based guidelines are universally available to help dentists in England (Delivering Better Oral Health, 2009).
- It is self-evident that the damage to the dentition that occurs when disease progresses, even when treated by fillings or periodontal treatments, will have irreversible effects that persist for a lifetime. Furthermore, the initial treatment will often result in a cycle of retreatment and repair with further irreversible damage and so carry a lifetime financial cost. The practice of dentistry is largely constructed around this cycle of repair and replacement. The major benefits from managing risk and preventing disease are not immediate but accrue over a lifetime. National data describe a population of older adults who suffered from dental caries early in life, with heavily restored mouths but often with relatively low levels of current disease, many of whom have experienced this cycle of care.

It is these three factors that indicate a need now to use services in a different way, to make sure we capitalise on the improvements in oral health and intervene early to minimise its lifelong impact. However, the statements above conceal large variations between individuals and population groups and could be misinterpreted. Dental disease is still a vast problem; most of our adult population have been affected by decay and fillings. Data from the Adult dental health Survey (2009) suggest that around 30% of all adult teeth are filled or crowned and at any one time there are probably over around 12 million adults in England alone with decay that would benefit from active treatment with a dentist. There are probably several million children with similar needs. The data for periodontal disease would identify a problem of very similar magnitude. In such cases, failure to intervene appropriately will result in greater damage with the potential for pain, tooth loss and both functional and aesthetic impacts.

The move to a capitation system carries risks in this regard. Before the introduction of the 2006 contract there was a clear incentive to treat and no incentive to prevent, because dentists were paid to treat, to fill, crown, scale, extract and replace. Fees for “operative interventions” such as

fillings and crowns result in fillings and crowns. With the introduction of the 2006 contract and the concept of a currency constructed around Units of Dental Activity (UDAs), the incentives became rather more complex, but the incentive was clearly still to treat, in some way, provided it attracted units of dental activity in an effort-efficient way. Capitation contracts, on the other hand, do not explicitly reward “operative” treatment; they indirectly reward the dentist for not having to pick up a drill as time saved can be used in another way (seeing more patients or time away from work). In theory, such contracts should incentivise prevention and health provided that the preventive activity requires less input than the operative alternative. However, disease still unequivocally needs treatment when it gets to a certain level. For example, decay that has progressed through to the dentine of the tooth would generally need filling to stop it from progressing, and we would certainly expect the clinician to provide this treatment.

Although it is not particularly intuitive, most dentists would agree that the boundaries between when to treat and when to observe are far from clear cut, and the risk of a capitation contract in dentistry is what is sometimes described as “supervised neglect”, in other words a bit too much observation and not enough intervention, leaving patients at risk of progressive untreated disease. In the case of operative interventions a shift away from the use of the drill would be a very desirable outcome, but not at the cost of progressive disease.

In the pilots, data have been recorded electronically using commercially available software systems which record both the presence of decay and the follow up treatment at a certain level. For the first time we can now look at the pattern of disease at different levels, whether active disease has been treated, when it is treated and how much is not treated. We also have data on aspects of diagnosis and record keeping which are part of the same decision making process.

8.2 Data sources and methods

In an ideal world, with chair-side systems in place, we would have been able to draw down data centrally on individual teeth and then follow them through to treatments by comparing with changes in the charts and the electronic record of activity. However, due to data quality issues in relation to accurate charting and treatment coding, the Evidence and Learning Group were concerned about the ability to do this safely and reliably at this point in the contract reform programme. This approach has to be the future of contract management and developing the ability to do this efficiently is a high priority, but at this stage we needed an approach that was completely robust.

Consequently, the approach advised was less efficient and produced a smaller volume of data but was much safer, and allowed the collection of data, not just on treatment, but also the context around what was observed.

Ten practices were selected using a random selection and replacement method to ensure at least 3 practices from each pilot type and at least one from each software supplier.

For each practice, ten patient ID numbers were selected randomly from patients who had been coded red for caries at an OHA or OHR between 1 January and 31 December 2012. The random selection ensured 7 adults and 3 children aged 12 and over were selected for each practice. The decision was made to analyse the results for adult patients only in this report because of limitations in interpreting what is appropriate treatment for children when a carious

lesion is on a deciduous tooth. In fact, the differences between rates of care in children and adults are relatively minor but it is probably easier to be clear about the implications with adult data.

A red RAG rating for caries means that the patient has at least one decay lesion at a level that would normally (but not absolutely automatically) infer a need for a filling or perhaps extraction. The ID numbers were given to one of two dental advisors who then visited the practices, accessed the electronic and paper records and identified lesions at the point of diagnosis in an OHA. They then followed through all records to the most recent entry and on a pro-forma, recorded the number of lesions and whether they had been treated by restoration, extraction or not at all according to the notes. They were also able to record data on when the treatment had been provided (against a six month standard) and the appropriate use of radiographs. They also recorded BPE scores and sought to identify whether appropriate periodontal care had been provided.

8.3 Results

8.3.1 Treating caries

There are a number of ways of looking at the follow up of caries with treatment, and for each measure one can look at an average score or at the distribution. Both approaches are relevant, but there is real merit in looking at each set of practice metrics in the context of the others as this illustrates both what might be achievable and also how this may fall short. Table 8.1 shows how caries was managed in each practice as well as the minimum, maximum and mean across the group for each variable.

Overall, 87% (out of the sample of 70, 95 percent confidence interval; 79% to 95%) of patients who had a diagnosed caries lesion subsequently were engaged in either operative treatment (e.g. a filling) or had an extraction, either of which may be appropriate. In real life, people do not always get the treatment the diagnosis appears to indicate; some may simply not return and others may turn down the opportunity to have treatment. Half of practices had 100% of their patients followed up with treatment. Given the potential of impact of the patients who did not attend, this is broadly reasonable, though the variation indicates the need for vigilance. The bottom row of the table gives an indication of the patients who we were able to detect from the records did not attend (DNA) and this was a clear factor at a number of sites in terms of follow-up. Due to the small sample of records taken per practice (seven per practice), it is not possible to say whether there is a statistically significant difference in performance between the ten practices, and a much larger sample would be required to determine whether the worst performing practice on this measure is consistently poor.

	Practice 1	Practice 2	Practice 3	Practice 4	Practice 5	Practice 6	Practice 7	Practice 8	Practice 9	Practice 10	Average	Min	Max
Caries data by patient (Results relate to 7 patient records per practice)													
Patients for whom some treatment for caries has been provided	7	6	7	4	7	6	7	7	5	5	87%	4	7
Patients for whom Treatment for caries is "complete"	6	6	6	4	6	6	3	5	4	5	73%	3	6
% of patients with complete treatment for caries whose treatment was completed within 6 months	83%	83%	100%	100%	67%	83%	100%	100%	100%	100%	90%	1	1
Patients with some private treatment for teeth with caries lesions identified	0	1	1	0	0	1	1	0	1	1	9%	0	1
Patients who have DNA'd and this has impacted on the practices' ability to provide adequate treatment	1	1	0	1	2	1	2	0	0	0	11%	0	2
Caries data by teeth with caries lesions (Results relate to 7 patient records per practice)													
Total teeth with carious lesions	16	14	13	10	19	10	39	24	23	12	180	10	39
Total teeth with carious lesions which were restored	12	9	11	6	13	6	22	17	5	9	110	5	22
Total teeth with carious lesions which were extracted	1	1	0	0	3	1	9	4	3	0	22	0	9
% of teeth with caries lesions where there is a record of treatment (restoration or extraction)	81%	71%	85%	60%	84%	70%	79%	88%	35%	75%	73%	35%	88%

Table 8.1 - Summary of caries indicators for adult patients

Overall, 73% of patients (95% confidence interval: 62% to 83%) who started treatment had all of the lesions that were recorded in their mouth treated by the time of the record check. Once again, patients may not have every lesion managed for a range of good reasons, but it is reasonable to expect that a large majority people would, as is the case here. Feedback from some practices suggests that whilst treatment may be undertaken, there are delays resulting from activities to deliver the pathway. To measure this, we set, as a metric, a limit of 6 months from OHA to the completion of treatment, a time scale that is fairly generous. Six of the ten practices met the six-month limit, whilst four saw the treatment of a minority of patients extend beyond this. Whilst there may be a number of reasons for delays, such as repeatedly cancelled appointments, these data suggest that whilst the large majority of patients and most practice are providing care in a timely fashion, there is some delay in some cases.

The second way of looking at this is at the level of teeth rather than patients (Table 8.2). One might imagine that every carious lesion on the dental chart should be treated but that is not the case. Patients may not return to have all of their treatments done or they may choose not to have certain treatment whilst dentists may, on reflection, make decisions to manage a few individual lesions in some other way, perhaps on the basis of what they have found when delivering other care. Poor record keeping also has the potential to affect the data. The data in the table suggest that, as one may expect, even in practices where all patients were followed up for care there were some instances where not every lesion was apparently subject to a treatment. The overall percentage of teeth with carious lesions that were either restored or extracted in the period was 73%. Even taking into account the reasons described above, this is perhaps a little lower than may be expected though there is no baseline data from current general dental services. On closer examination, eight of the ten practices treated around 70-90% of lesions, which would look like a reasonable norm. However practice 9 has a particularly low apparent provision of care (8 of 23 lesions). This may be a result of just a couple of patients not returning or perhaps poor record keeping, but again illustrates the need for vigilance.

	Practice 1	Practice 2	Practice 3	Practice 4	Practice 5	Practice 6	Practice 7	Practice 8	Practice 9	Practice 10	Average	Min	Max
Charting accuracy and record keeping data													
Patient records with dentition charted	7	7	7	7	6	7	7	7	7	7	99%	6	7
Patient records with correctly completed/signed FP17DC present	6	0	0	2	3	4	6	6	0	0	39%	0	6
Patient records with bitewing radiographs available for the patient (taken in the last 2 years)	6	6	3	4	5	4	4	7	4	3	66%	3	7
Patients records where the patient's caries RAG score appears to be consistent with risk and disease indicated in patient records	7	7	7	6	6	7	7	7	7	6	96%	6	7
Patient records with BPE recorded	7	7	7	7	7	7	7	7	6	6	97%	6	7

Table 8.2 - Summary of record keeping indicators

8.3.2 Charts and record keeping

A number of other clinical measures were followed up as part of this process. The simple recording of data is a basic first step and, aside from anything to do with the OHA, is a medico-legal and professional requirement. A 100% recording of dental charts would be a reasonable expectation, and whilst a 100% completion of BPEs would also be ideal, the requirement to complete a BPE is new to the OHA so a slightly lower response would not be wholly unexpected.

Table 8.2 shows that, encouragingly, the rate of patient records with dentition charting is 99% (there was one chart missing or incomplete) and of BPE scores recorded was 97%.

All of the cases selected were “red” caries, so had at least one detectable lesion. Given this was the case, there would be a risk of further undetected lesions so we would also expect a majority of patients to have received bitewing radiographs at some point over the previous two years, in line with guidelines. Encouragingly a majority did (66%) but this should probably be substantially higher, and the range across the ten practices was 43% to 100%. We were also able to check that the data recorded on risk was in line with the RAG status. With very few exceptions this was the case.

Clinical advisors also noted any cases where patients had BPE scores suggesting the need for periodontal care in the form of thorough scaling, but where this appeared not to have been provided. Anecdotally, periodontal care under current contractual arrangements is often provided privately or perhaps not at all. Whilst data to corroborate this are hard to come by across the general dental services, we were able to follow this up as part of this pilot exercise on a case by case basis. In a number of cases, there was an apparent treatment need with no evidence of periodontal care and others where this was provided privately.

The low proportion of completed FP17DCs (the treatment plan form which patients are supposed to sign) is a cause for concern that needs further consideration although this may not be an issue specific to the pilots.

8.4 Overall comments and conclusions

Overall the follow up and treatment of carious teeth seemed not to be a major problem in the ten practices that were sampled for this exercise. As these were randomly selected and are relatively representative of all 70 wave 1 pilots across the measures available, the hope is that this is true of all pilots, but, as illustrated elsewhere in this report, every practice in the pilot is unique in its circumstances and a wide range of behavioural responses to the piloting challenge can be observed across the programme. For these ten practices, dentists were generally getting on and doing their job of managing the disease as would be expected, and there is certainly not evidence for widespread supervised neglect. Certainly, some patients have not received all of the care that the charts would indicate they required, but in many cases that may be nothing to do with the fact they were in a pilot. However, there are one or two instances of practices where the results were a source of rather greater concern and may need to be followed up further. The data on record keeping are reasonably encouraging.

The ability to interrogate the data is a primary concern when considering contract management, allowing the production of clinically meaningful quality measures. Undertaking this manually was rather slow and cumbersome but at this stage in the process it produced robust data. When there is greater confidence in the ability to manage the electronic data safely, there is no reason at all why this could not be done at the press of a button, either centrally or at the practice.

One can easily envisage a range of simple counts and ratio based measures, such as those produced here, to allow practices to monitor their own performance, to help with professional and co-operative contract management based on good dentistry, and to help patients make decisions about choosing practices. If these are appropriate they will also drive good dentistry. This exercise has demonstrated, in principle, what might be possible.

9. Findings - Dentists, the clinical pathway and I.T. decision support

Researchers

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9.1 Introduction

The introduction of the new pilot contract introduced a new care pathway with the oral health assessment (OHA) as a central component. In order to support the new care pathway and OHA, three IT systems were developed to collect data from the OHA. The level of development that was required for these systems varied depending on the system, but these included some very well established dental software packages.

The data entered into the system at the chairside generate a simple risk indicator (red, amber or green – RAG rating - for each of four important oral conditions). The use of the RAG rating to monitor risk and as a patient information tool is discussed in Section 7, but when linked to evidence from clinical trials and reviews, provides an indication to the dentist of the most appropriate 'next steps'. The intention was that this system would provide the clinician with clear evidence-based support (e.g. advice about the recall interval and evidence-based prevention matched to risks). The linking of this to the pathway was explicitly not intended to remove clinical autonomy or leave decisions solely to a computer algorithm.

Feedback prior to this exercise, mostly gathered through support groups, indicated a variety of opinions with regard to practitioners' experiences of the IT decision support. Some practitioners interfaced well with the software whilst others may have felt constrained or restricted by this form of decision support.

This project was undertaken to focus upon how individual clinicians interacted with the decision support software and to explore practitioners' views about the impact of this tool upon clinical decision-making.

9.2 Aims

The aims of this piece of work were as follows:

- (i) To understand how individual clinicians in the pilot interpreted and interacted with the IT decision support, and why they interacted in the way they did.
- (ii) To identify the beliefs and concerns about the wider system which underpin individual decisions.

(iii) To explore whether and how the concept of resource and business management feeds into decision making in a practice and whether that is a consideration when using decision support.

One of the drivers to undertake this exercise was that findings would not only inform the understanding of the contract reform team in terms of how dentists were using the pathway, but also that the findings could be used to help develop appropriate advice about how to use the support from the evidence-based algorithms, either in the short term or across any implementation.

9.3 Method

A purposive sample was drawn in order to identify a relatively small number of case-studies for an in-depth study. Pilot practices were selected to incorporate the three pilot types (1, 2 and 3) and include providers and performers. It was not the intention to generalise the findings to all pilot practices across the country, but to use the data generated to explore in depth, a number of practitioners' experiences. As with any qualitative research, the sample size was dictated by the need to achieve data saturation.

A team from Newcastle University, experienced in qualitative research training, provided methodological and practical training to four NHS Dental Services Clinical Advisers in the conduct of semi-structured interviews. At each practice, they undertook the interviews according to a topic guide which acted to structure the discussion. Interviews were audio-recorded verbatim and transcribed professionally. The interviews were transcribed very soon after they took place and allowing data analysis to be undertaken using the constant comparative approach. This provides an opportunity to develop the topic guide from data received during the interviews so that this can inform the conduct of the next interview. Thematic analysis of the transcripts involved building a framework to assist in the identification and presentation of emergent themes. Data, in the form of verbatim quotes, were assigned to themes to build up a picture from individual interviewees. RT undertook the primary analysis with support and review from CE.

9.4 Findings and discussion

Fifteen semi-structured interviews were conducted by the four clinical advisors (Table 9.1). The mean duration of the interviews was 30 minutes (range 15-40 minutes).

	Type 1	Type 2	Type 3	Total
Performers	5	3	1	9
Providers	3	2	1	6
Total	8	5	2	15

Table 9.1- The number of qualitative semi-structured interviews by pilot type and professional role

The central theme from the data collected focused upon the IT system which supported the OHA. However, on many occasions it was not possible clearly to separate the views about the interviewee's relationship with decision support software from its impact upon individual patients, the operation of the dental practice as a business and its effect upon dental teams (see Figure 9.2), and these three supporting themes emerged and are reported here.

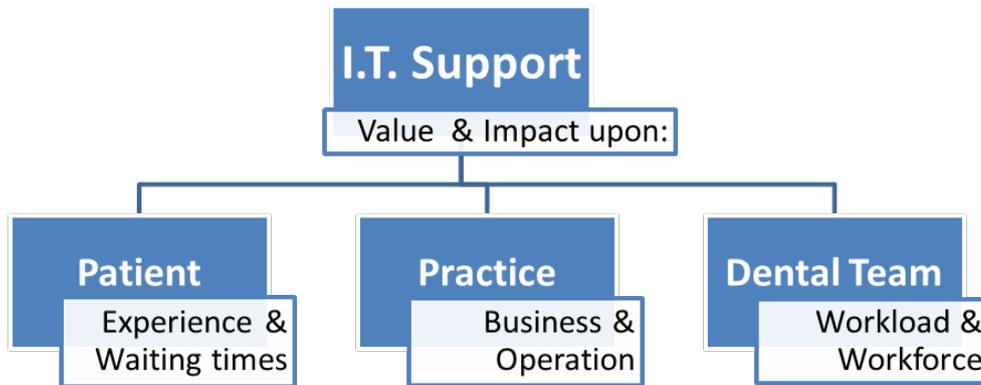


Figure 9.2 - Schematic of the key themes with respect to the decision support (IT) software and the impact upon key stakeholders

Each theme will be presented in turn alongside verbatim quotations to provide supporting evidence supporting the identified theme.

9.4.1 IT decision support - Overview

Participants typically described the OHA decision support software as being very thorough and as a consequence, some perceived this aspect of the care pathway to be very time consuming. However, many of those interviewed described how their time spent undertaking the OHA had reduced with experience.

“Initially you’re very slow until you see what you’re being asked to do...and then once you’re familiar with it, it becomes second nature”. (Performer, Type 2 pilot)

Several participants described how the decision support software and the associated OHA questions had facilitated communication with patients, perhaps ‘endorsing’ some of the more personal lifestyle and social history questions which some practitioners may have found more challenging outside of the pilot.

“There were things that you probably felt rather embarrassed about, rather prying about before, and it seems to have empowered us to ask all those sorts of questions and I have to say there has been very little resistance from the patients at all”. (Provider, Type 1 pilot)

Although the OHA decision support software was described as providing a clear structure for practitioners, there was concern that for some patients, aspects of the OHA were too detailed and sometimes unnecessary. Several practitioners highlighted that the number of tick boxes for the extra and intra-oral examination sections could perhaps be shortened for young patients who had been regular attenders. This is similar to comments coming from support groups where

frustration has been expressed around the need to collect a large amount of data for emergency appointments.

As a consequence of the length of time taken to undertake the OHA, the vast majority of participants discussed how initially they had been very reticent to 'override' the decision support software and delete items they considered unnecessary. There was a perception that doing so may have been stepping outside of the rules or the 'spirit' of the pilot. However, as practitioners' experience with the pilot evolved, participants typically expressed greater confidence in deleting items suggested by the software, on the basis of their clinical experience and knowledge of their patient.

"I feel like we're doing proper check-ups now...we're making proper notes, all the information's there...I just feel you can't go very far wrong, it doesn't let you go wrong...sometimes I feel there's lots of unnecessary items, but now I feel very well able to delete, I haven't got a problem". (Provider, Type 3 pilot)

Analysis suggested that practitioners interviewed in this study firmly viewed the IT software as a tool to support decision-making rather than as a rulebook, though there was some variation in the confidence expressed in this regard. The importance of clinicians' judgement and expertise in decision-making was highlighted as this process typically requires multiple sources of information that may not always be captured within a computer algorithm.

"When they designed the care pathway we thought that, you know, we were supposed to follow the pathway rigidly, but I think the idea now is, to use that as a guide, but as a clinician it's up to your own judgement...what you think is best for the patient". (Performer, Type 1 pilot)

9.4.2 IT decision support - areas for improvement

The semi-structured interviews identified a number of broad areas within the IT decision-support software which practitioners believed could be improved. These areas were themed and they are presented below. Some of these issues may have been addressed (to varying extents) since the interviews were undertaken as a consequence of software revisions.

a. The periodontal domain

Of all the clinical status measures in the OHA, the periodontal domain generated the greatest volume of discussion amongst participants. Some practitioners criticised the periodontal domain describing it as 'overkill' with respect to the number of management options generated by the software. A large number of examples and scenarios were cited where practitioners described deleting the management options suggested by the software.

"I think what it may be trying to achieve with perio may be a bit unrealistic...my experience is that it really bogs you down in that particular domain...it's getting you into intensive perio and goes on about referring...you'd be doing it every 5 minutes really in my practice if you were...". (Provider, Type 2 pilot)

A number of 'glitches' were described by participants that had resulted in them having to change or delete a number of treatment options suggested by the software. For some clinicians, the repeated nature of these issues suggested that the periodontal disease management pathway required review. Another cited concern that the OHA software would formulate a

treatment strategy without a diagnosis. Clearly, the latter scenario highlights the central importance of the clinician whilst using the IT software as a decision support tool. Often, a compromise will be required.

“You have to adapt it...sometimes the patient doesn’t want referral, say a perio case, do they?... You’re having to delete all these things because the patient’s already accepted they’re going to lose all their teeth and are not interested in any further things”. (Provider, Type 2 pilot)

b. The RAG score

Many practitioners acknowledged that the RAG score appeared to act as a useful tool to assist patients in understanding their disease risk status. The RAG score was reported by some to act as an incentive for some patients and the concept was deemed useful in demonstrating improvement (or an increase in risk status) over time.

“...It’s a very, very beneficial system for patients because we’re finding it much, much easier to explain to them ‘Well, this is what we’ve assessed. This is the situation now and this is where we need to get to. And for you to be there, we need you to follow this path, the aftercare, the prevention you need to carry out at home to get you to green’”. (Performer, Type 1 pilot)

However, despite these positive comments about its utility as a motivational tool, a number of practitioners reported that they neither used nor referred to the RAG score with patients.

“I don’t really pay much attention to that to be honest with you because I don’t really ...the time constraints I’ve got, I haven’t got a lot of time...my nurse would probably go through more of that element than I would...so in terms of RAG status, I pretty much never look at that personally”. (Performer, Type 3 pilot)

Additionally, several practices did not provide patients with a hard copy of their care plan incorporating this information. Practitioners with these views typically preferred to provide a detailed verbal description for patients including the specific problems that had been identified rather than referring to an ‘overall’ RAG score.

“I suppose the RAG is one of the more innovative things to come in, and I think that’s given patients a rough idea. But at the same time the advice given may have been a bit too technical for the average patient to comprehend... from what we have experienced, it’s not everyone’s cup of tea”. (Performer, Type 2 pilot)

Other barriers to fully embracing the RAG score included practitioners not having access to colour printers in their practices and several were concerned at the volume of paperwork and the associated financial cost in supplying information in this format.

Uncertainty and variability in the use of the IT decision support (RAG and care plans) as a feedback mechanism for patients may currently be a limiting factor in the ability to maximise the efficiency and preventive potential of the OHA and pathway. This is an area that may need some further clarity.

c. I.T. software packages

Early feedback has highlighted a number of areas for improvement with the IT decision support software. Some of these issues may have already been addressed either fully or partially as a consequence of software revisions. Practitioners acknowledged the length of time required for the OHA and that the software was often 'clunky' and sometimes 'muddled' in the way that aspects of the OHA had been structured. Several clinicians described trying to 'group' associated clinical measures and advice together for the benefit of referral to other members of the dental team. This process was deemed an inefficient use of limited clinical time.

However, participants recognised that both they and the software companies were constantly learning as well as finding ways to work more efficiently.

"I wouldn't say we found shortcuts to get through the pathways, but we found easy ways of doing things more efficiently...because these software companies are learning as we are...I wouldn't say it's perfect but we are getting there. It's just the time constraint; it does take time to do, to do it properly". (Provider, Type 1 pilot)

Despite frustrations about the volume of data required in some quarters, several practitioners described frustration, with an inability to input the level of detail required in aspects of patients' social and diet histories.

"...the computer doesn't allow you...that is one of the complaints we've had actually, it doesn't allow you to record a patient's diet, only the fact that it's either okay or isn't...you can put in whether they have a sugar habit or whether they have a dietary acid habit, but as to what it is, you can't record that – not on the software we're using". (Provider, Type 1 pilot)

The language generated in patient care plans was frequently described as being too technical and detailed for patients.

"One of the problems is...the patient care plan...there's a lot of technical jargon...it needs to be plain English really, more patient-friendly...it's written almost as an academic would write it...things like 'consider Advanced Care Pathway Guidance'". (Provider, Type 2 pilot)

Clearly, the use of appropriate language in patient information is fundamental to the usefulness of the care plan. It is possible (though not made explicit in the data) that this is one reason why the care plans are not issued in some practices. It should not be difficult to design a care plan template that is user friendly, or perhaps can be issued in different form.

9.4.3 Patient feedback

The clinicians interviewed in this study provided a significant volume of information with regard to patients' opinions about the pilot programme and particularly their experience of OHAs. Whilst patients were generally reported to be very positive about the OHA (not least the 'extra' time spent in discussion with members of the dental team as part of this process), some were unhappy about extended waiting times for treatment where practices' appointment books were extremely busy. This was often reported by dentists to be the result of the number of interim care 'IC' appointments.

“A lot of them [patients] went away saying that, you know ‘the time you spend with your assessment, I’ve never had this much time spent with the dentist before, in terms of your check-up and explaining things”. (Performer, Type 1 pilot)

“The patients like it...but because we’re spending so long with people, our appointment books are really, really, you know, overwhelmed...that’s the downside”. (Performer, Type 2 pilot)

“The patients are very positive... actually love it because they get such a lot of personal attention and they think it’s great, marvellous”. (Provider, Type 2 pilot)

In a relatively small number of cases patients were reported to have expressed intentions to visit other dental practices which could treat them more quickly, and this was a serious concern for these practices. Clearly, there are inextricable links between waiting times, patient satisfaction, the potential impact upon dental practices as businesses as well as the effect of this workload upon the morale of all members of the dental team.

The impact of the decision support software upon dental professionals’ behaviour was noted by some patients who became aware that practitioners could become overly focused upon the computer screen.

“You spend a lot of time clicking...many, many patients will say ‘Look, you know, you’re looking at that more than you’re looking at me!’...and there’s four ‘people’ in the room in the exam isn’t there?...me, the nurse, the dentist and now there’s the computer”. (Performer, Type 3 pilot)

The example above was not typical of all dental practices but such expressions are significant in understanding the variation of approaches to the software. Many practitioners delegated the responsibility of data entry to another member of the dental team whilst the dentist spoke directly with patients. This arrangement was reported to avoid the issue of the dentist focusing their attention upon the software.

“The nurse does it all – puts it all in. In fact she asks most of the questions and inputs it”. (Provider, Type 2 pilot)

In summary, practitioners overwhelmingly reported that patients had responded very well indeed to the concept of the OHA and the personalised care pathway approach. However, there were also significant concerns about the length of waiting times for treatment by some practices.

9.4.4. Practice management

Within this domain the impact of the OHA and the pathway upon skill mix within practices was evident as an important consideration.

Not all dental practices will employ a range of dental care professionals including hygienists, dental therapists and oral health educators. However in this study those that did generally reported that they were able to manage treatment waiting lists well through referrals to DCPs working within the practice.

“We use two surgeries with two oral health educators and one dentist working between the two to do OHAs, because a lot of the work we do on OHAs doesn’t need to be delivered by a dentist”. (Provider, Type 1 pilot)

In-practice referrals to DCPs were often found to be a more efficient use of resources. Where practices did not have access to wider DCPs, practitioners perceived that their presence would make a significant difference to their workload and efficiency as a pilot practice.

“I think I could make it work better if I had a hygienist or therapist, that would make a massive difference because I could then you know, offload...I’m a very expensive hygienist at times really”. (Provider, Type 2 pilot)

Interestingly, despite recognising this potential benefit, a change in structure had not been made. Where practices had fully incorporated the skills of DCPs, their involvement in patient care and particularly IC (interim care) appointments had been particularly valued:

“...a lot of the work is really more suitable for therapists and nurses with additional skills... a lot of the IC’s are done by the therapists and the extended duty nurses...a lot of the DCPs are a lot more involved in patient care – I think that’s positive”. (Performer, Type 2 pilot)

In this theme, the reported advantages of encompassing greater skill mix in practices was tempered with concern focused elsewhere upon the length of some waiting lists for patients to receive treatment. Understandably, the impact of conducting a relatively large number of OHAs at the start of the pilot had in some cases led to longer waiting times for treatment. This situation had not been well-received by patients or practice owners.

“It has been negative for the practice in terms of growth...we’ve been able to see fewer patients in the last 18 months...so instead of being a growing practice we are perceived locally as being effectively closed...we can’t take any new patients...that’s not great”. (Provider, Type 1 pilot)

Other participants acknowledged the issue of treatment waiting times but that in their experience, the impact of the pilot on this factor had not been excessive. Another participant concisely summarised the views of many practitioners with respect to this theme on day-to-day practice management and the impact upon business.

“...to do the pilot properly takes longer...you’re talking to the patient more...I’m not saying that’s a bad thing but I just think it should be taken on board if we’re spending less time treating people...there’s either going to be a shortfall somewhere, there’s going to be complaints or there’s an element of people who might consider going somewhere else”. (Provider, Type 1 pilot).

9.4.5. The dental team

The impact of the pilot on skill mix within practices has already been discussed as a consequence of the inextricable link between managing practices as businesses and dentists’ referrals to other members of the dental team. One group which has not yet been mentioned are practice reception teams and associated managerial and administrative staff. Many participants were keen to acknowledge the support of reception staff on the ‘front line’ in managing very busy appointment books.

“I think it’s tough for reception because there are huge issues with access to appointments and so obviously, they’re having to deal with that quite a lot and that’s quite difficult for reception...If we’re going to spend four times as long on a check-up and possibly two, three times as long on care, the appointment access isn’t good. So they’re explaining to patients a lot but they’re coping with that”. (Performer, Type 2 pilot)

Several practitioners explained that training all members of the dental team about the pilot was important and that to gain maximum benefit, training should ideally be conducted in the practice.

“I think that training in the practice was a good idea...I think it is really important to train everybody and reception as well because they get a – well, they have to fend off a lot of questions”. (Provider, Type 3 pilot)

Despite concern about maintaining access to the appointment book for many practices, others perceived that they had overcome the initial surge of OHAs and that the practice environment had now become more settled for reception staff. In some cases reception staff were reportedly busy explaining certain aspects of the pilot to patients as well as a number of questions surrounding the purpose and typical content of IC (interim care) appointments.

“The throughput of patients has reduced and so there’s a pleasanter atmosphere. They’re not rushed off their feet like they were and it’s a more steady pace...they’ve had a little bit more work to do explaining to the patients about ICs and charges...I think they’re happier”. (Provider, Type 2 pilot)

Finally, a number of participants raised the issue of long-term job security in primary dental care for associate dental practitioners. With the move towards the increased use of DCPs and extended duty nurses for certain clinical interventions, several performers interviewed in this study perceived the ‘associate’ role to be potentially ‘at risk’ in the future.

“As a practice owner it’s not a threat. It is a threat, certainly for associates.” (Performer, Type 1 pilot)

9.5 Overall comments and conclusions

Clearly, there is a balance to be had between time spent collecting information and giving advice and the time it takes to see new patients and do treatment. In different practices that balance can feel different. The extent to which the IT decision support supports or hinders clinical care and practitioner independence was what was explored here. The following conclusions can reasonably be drawn:

- Respondents generally viewed the I.T. decision support software firmly as a tool (rather than a rulebook) to inform clinical decision-making though the level of independence, flexibility and confidence to override it was quite variable between dentists.
- The data suggest that this was dynamic and that in the earlier stages of the pilot process, some participants believed that deleting items suggested by the software would have been akin to ‘stepping outside of the rules’ or going against the ‘spirit’ of the pilot. However, the data suggest that these early concerns were not widespread

by the time the interviews took place. Nevertheless, this time to adjust is an important consideration for any future transition to an OHA.

- There was evidence that practitioners felt that the I.T. decision support software requires further refinement to improve the efficiency of data entry and to permit more detailed recording of specific aspects of patients' histories in some areas and greater efficiency in others.
- The themes identified in this study suggest that there have been significant inconsistencies in the way that pilot practices have implemented aspects of the pilot at local levels (variation in the distribution of written patient care plans, the use of RAG scores for feedback and the approaches which practices used to manage their appointment books varied markedly).
- The concept of interim care (IC) appointments was not always clear to patients, nor to some practitioners. Several respondents cited the provision of ICs as an important cause of lengthening waits for treatment.
- The themes identified in this study are inherently linked to one another in complex and often inextricable relationships. To varying extents, clinical decision-making is linked to factors including the availability of appropriate staff, the status of practice appointment books and even local practice policies. The business of the practice was considered by clinicians in the implementation of I.T. decision support recommendations.
- A number of practices reported excessive waiting times for patients to receive treatment, however others reported no such concern.
- Where skill mix has been available to pilot practices and been utilised to support the pathway, it has generally worked well.
- Engagement with the software, and the way different dentists responded to the new system probably did impact on practice efficiencies to a very significant degree early in the process, though the approach of dentists "matured" over the period. However an understanding of why practices have performed differently, and have operated the pathway differently can only be gained by looking at the approach to managing the practices and business models adopted.

10. Findings - Cross case analysis of differential falls in access

Researchers

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10.1 Introduction

The data from Section 6 illustrated a net reduction in patient list sizes across practices, but also showed that this was hugely variable from practice to practice. It also failed to show any consistent pattern relating to the relationship between practice metrics and the change in patient list size. The qualitative data in Section 9 clearly illustrated that the way that practices were operating the clinical pathway, the software and the business was also, apparently, highly variable. Dentists had mostly adapted to the use of the new systems over time, but had adapted in different ways and seemingly at different rates. The approach in Section 9 was to draw out an understanding by exploring the opinions and actions from a range of dentists in different practices, and it was driven by the need to understand the specific relationship between dentists and the decision support tools they had been given. With the combined programme, clinical and qualitative data available as described in the previous four sections, it became clear that to understand the potentially important changes in patient list size, which will be a critical consideration when setting up a new contract, we needed to drill down further using qualitative approaches. It was the operation of the practices as businesses that the group felt was a priority for further work.

To do this it was going to be necessary to look more deeply at the quantitative data revealing variations in changes in patient list size, using qualitative methods in order to explore differences which were apparent between practices. A purposive sample of 12 practices was therefore chosen for an in-depth study.

The majority of the selected practices (10 of the 12) were Type 2 and Type 3 pilots, since these had relatively stable list sizes prior to the start of the pilots and had been assigned a pilot type on that basis. Practices were stratified to ensure that there were practices with a range of changes in list size, from those that had stable or slightly increased list sizes (stratum A), those with a moderate reduction in list size (>5% drop to 10% drop: stratum B), to those with large reduction in list size (>10% drop over 18 months: stratum C). Six practices were chosen with Stratum A, 3 from stratum B and 3 from stratum C. There was also an attempt to balance the sample with a range of geographic areas, proportion of skill mix within the team and size of the practice. More detail on the practice characteristics is included in Appendix 4. The practices were visited by an NHS BSA Dental Services Clinical Advisor and Dental Contract Reform Programme Regional Support Lead. Structured interviews were conducted with the practice owner and practice staff and the end to end process for an oral health assessment observed.

Some interviews were digitally recorded, others captured through note taking. The visits were conducted between July and September 2013.

The data came in the form of case notes of interviews and observations and audio recorded interviews which were transcribed prior to analysis. Formal analysis of the data was undertaken by a team from Liverpool University.

10.2 Analysis approach

Our position (or lens) for this analysis was to look to compare the data for differences and similarities between cases which might explain why some practices had very large falls in access whilst others maintained their access. If data suggested themes that were commonly experienced across all dental practices and therefore were not pertinent in explaining why access had fallen more in some practices than others, it did not feature in the analysis. We were looking to draw out the differences.

The analysis of these data was approached through a thematic case study analysis, a technique which harmonises a high degree of structure in the process of analysing qualitative data with a flexibility to adapt data to the needs of the particular study. The process involves the recognition, emphases, examination and subsequent recording of patterns or 'themes' within the data which are 'coded'. There are no predetermined themes; all themes emerge from the data and there is on-going potential to return and alter themes throughout analysis, nothing is sacrosanct.

Data analysis software, NVIVO Version 10.0, was used to aid the organisation of the data and subsequent 'coding' of the themes. Analysis began by separating practices by access strata (A – more or less stable or increased access, B – moderate access reduction, C- large access reduction) and creating 'data sets', which included both observational and interview transcription data for each practice. Each data set was read, familiarised and re-read with some early themes developed before moving on to the next phase. Whilst coding was undertaken by one (non-dental management science) researcher, throughout this 'coding' and analysis procedure themes were discussed, altered, and settled by a wider dental academic team.

10.3 Description of themes and sub themes

Tables 10.1 and 10.2 illustrate the six themes that emerged from the data (Skill Mix, Buy In, Management Typology, Patient Focus, and Streamlining).

Table 10.1 defines the themes themselves, their subthemes, following up with indicative quotes.

Table 10.2 provides a more detailed yet generalised overview of the cross case differences according to the A,B,C strata.

Overarching Theme	Definition	Sub Themes	Indicative Quotes and Observations
Skill Mix	The way skill mix is utilised by practices.	<p>Letting Go – <i>The ability to recognise and commit to a delegation of care pathway delivery</i></p> <p>Housing – <i>Practice ability to house and develop a skills mix</i></p> <p>Usage Extent – <i>The breadth of skills mix utilisation</i></p>	<p>“Quite passionate about... getting other people to do stuff for me, always have been... I don’t like doing simple stuff, I prefer to do the dentistry that’s rewarding” (Provider, Practice A162)</p> <p>“I’d be quite happy for somebody else to do that... they’re [skill mix staff] perfectly capable of doing it” (Dentist, Practice A217)</p>
Buy In	The agreement with, understanding of, and subsequent cohesion to communicate and deliver the pilot system.	<p>Patient Buy In – <i>Reciprocal efforts to ensure patient understanding and co-operation with the pilot system</i></p> <p>Staff Buy In – <i>Comprehensive practice wide understanding and communication of the pilot system</i></p>	Explaining the pathway approach is fundamental to getting buy in and improved outcomes... “Patients need to understand the pathway approach – otherwise they’ll go elsewhere” (Provider, Practice A162)
Management Typology	The underlying managerial persuasion concerning business and commercial management decisions relating to the pilot system.	<p>Proactive – <i>Anticipatory management, decision making, and recognitions through creations or control</i></p> <p>Reactive – <i>Making decisions, changes, or recognitions in response to occurrences rather than creating or controlling</i></p>	“[Increasing patient access] due to active management and realisation in October 2012 that numbers were falling... Have taken on approx. 2000 new patients and know that they have over accepted as they expect some patients would drop off” (E&L observation, Practice A979)
Patient Focus	The extent to which the operation of the pilot is geared around the patients’ wishes and expectations	Patient Obligation – <i>Operation of contract is geared around patient expectations and wishes, the converse is an obligation to the contract</i>	“Occasionally you’ll get a patient who needs half an hour... They need half an hour of teaching, coaching, you know, encouragement... explaining you know the importance of oral health” (Provider, Practice C1292)
Streamlining	The improvement or otherwise in the efficiency of processes gained from active input or natural progression within the system.	<p>Active Streamlining – <i>Efficiency advantages that emerge from explicit and active measures</i></p> <p>Natural Efficiency – <i>Efficiency advantages that come with greater familiarity and experience of processes</i></p>	<p>“We use our own [templates]... for all the treatments and tailored it to what I want so it fits in then with this pathway” (Dentist, Practice A217)</p> <p>“I don’t know how we can sort this problem, but in our practice we try to ever six months change our approach to all this” (Provider, Practice A887)</p>

Table 10.1 - Summary of Overarching Themes

Overarching Theme	Stratum A <i>Little drop or increase in list size (5% drop or any increase)</i>	Stratum B <i>Moderate reduction in list size (>5% drop to 10% drop)</i>	Stratum C <i>Severe reduction n list size (>10% drop)</i>
Skill Mix	Practices understand the benefits that utilising a skill mix can bring, and most are able to let go and delegate. There is some mix on their ability to house but most succeed at this. The majority of these practices utilise the skill mix to a strong extent.	Practices not willing to delegate or let go for varying reasons but specifically attitudes towards delegation and skill mix and having no explicit skill mix protocol. Some do however see the benefit a skill mix can bring. Skill mix is ultimately not used to a great extent and practices highlight multiple barriers in being able to house it.	Some practices are unwilling to let go, although others recognise the benefits and would consider utilising their skill mix going forward. Practices are not currently utilising their skill mix at all, they highlight certain barriers to being able to house such as physical space and training.
Buy In	Selectively discusses the RAG and pilot system with patient and are well placed to get their buy in through marketing, patient forums, and communication. They recognise the importance of communication. Staff mostly buy in to the pilot, are very knowledgeable and provide good explanations.	Selectively discusses the RAG and pilot system with patient and they recognise the importance of this communication. Staff are mostly buying into the pilot, however there has been difficulty in spreading the word and not all staff engage in pilot as much as would be liked by management.	Many patients are not given enough information about the pilot and the RAG system or discussion is inconsistent. Some practitioners do not like the RAG, some do not follow the pilot pathway, and in some cases not all members of staff understand the pilot (e.g. management and receptionist).
Management Typology	Predominantly proactive management typologies, this style of management included measures such as performance management, operational efficiency such as cutting or extending hours, a focus on strategy and a recognition of commerciality through marketing activities.	Predominantly reactive management typologies. Includes realisations that changes need to be made, such as implementing a zoning system after being part of the pilot for 6 months.	There was limited evidence to suggest with any certainty an explicit management typology for stratum C, but evidence points toward a reactive stance.
Patient Focus	All practices feel obliged to provide check-ups at interim care appointments and are comfortable overriding the system to provide a shorter recall if necessary. Some practices are much more explicit about “whipping through” patients than others.	All practices feel obliged to provide check-ups at interim care appointments and are comfortable overriding the system to provide a shorter recall if necessary.	All practices feel obliged to provide check-ups at interim care appointments and are comfortable overriding the system to provide a shorter recall if necessary. Spends longer time with patient if necessary or if patient prefers.
Streamlining	Widespread natural improvement and active streamlining measures such as template development, form completion protocol, and regular identification of improvements.	All noticed a natural bed in and improvement over time, but very little examples of active streamlining.	There is only a notice of natural improvements over time and very little to point to explicit active streamlining measures.

Table 10.2 - Summary of Cross Case Differences

10.4 Skill Mix

Like many practice characteristics, skill mix percentages in the chosen practices had a weak relationship to access position. Deeper and more searching qualitative investigation showed that skill mix utilisation i.e. the way skill mix is approached and appropriated, has a noteworthy influence on access position. In other words statistics, for example, on the proportion of the team made up of DCPs do not reflect the fact that in some teams, even with DCPs, there is limited delegation and team-working.

10.4.1 Letting go

One characteristic of utilisation is the implicit ability of a practice, namely management and dentists, to ‘let go’ and delegate to their skill mix staff.

“I’m quite passionate about therapists and getting other people to do stuff for me, always have been... not just therapists it’s EDDNs as well... I’ve had a therapist working for me from day one... I don’t like doing simple stuff, I prefer to do the dentistry that’s rewarding” (Provider)

“I refer very little to the therapist... I would say I’m a dinosaur” (Performer)

“We have toyed with the idea [skill mix] quite a lot but we just haven’t... the problem is the dentists are really popular and... I’m almost like if it isn’t broke don’t fix it” (Provider)

The ability to let go and delegate was able to free up dentist availability for more time consuming treatments that enable the practices as a whole to better manage the care pathway.

10.4.2 Housing skill mix

Similarly, data showed that skill mix utilisation was trenchant where practices were able to harmonise their skill mix, house it and develop it through various measures. First and foremost there was a need to have adequately trained EDDNs, and this was limited by a lack of local availability of local training courses for them.

“[Training requirements]... Would like to get nurses onto additional training courses such as fluoride varnish and OHI but there is a problem with availability of such courses in the area” (Practice Manager)

Managing work flow and delegation in the practice was a challenge to skill mix implementation. DCPs were perceived by some to offer a less flexible workforce: in terms of covering dentists’ annual leave, and patients requiring being rebooked with dentists for particular procedures. A larger size of practice team was thought to make ‘housing skill mix’ more feasible.

“So larger practices that maybe have like ten... I think they would find it easier” (Performer)

Remodelling skill mix in the practice was challenging. Training courses for EDDNs need not only to be available, but the current dental nurses need to want to take on a new role. Remodelling skill mix necessitates staff changes in the team.

“The dentists are not doing longer hours but the hygienist changed to a therapist in 2012 for greater flexibility of treatments. Nurses that were not willing to re-train left” (E&L observation).

What's more, the physical space to present and adopt skill mix use effectively and efficiently, was found to be a key driver in how practices can reconcile a skill mix with the care pathway.

“Surgery refurbishment helped this change in skill mix... created oral health education room for the now trained dental nurse... greater efficiency in terms of investing in staff training, investing in equipment” (Area Manager)

Practice space utilised for the skill mix was something of a physical embodiment of the care pathway for certain practices which helped their efficiencies management of staff and processes around the pathway. Practices without this physical space highlighted the benefits that such space would bring to their ability to cope and manage the care pathway effectively.

10.4.3 Usage extent

What became clear throughout the cases is that although some practices had the scope to let go and house a skill mix, they were ultimately not using it to their full potential at that particular time.

“Not using [DCPs to deliver the pathway] at the moment, but will be” (Practice Manager)

“Hygienist is totally private... DCP is restricted” (E&L observation)

The lack of usage ties into the practice ability to harmonise their skill mix and also at what stage of this harmonisation they are at. Some practices are just beginning to put this in place and going forward may have a much larger usage.

10.5 Buy In

A staff and patient wide buy in toward understanding and communicating the pilot system was found useful to maintaining access by aiding practice efficiency, patient acquisition, retention, co-operation and motivation.

10.5.1 Patient Buy In

Patient buy in illustrates how practices provide patients with a base understanding of how their treatment is structured and subsequently judge when and with whom it is necessary to provide further discussion. The buy in is approached differently from practice to practice and varies in its influence.

“[Communicating RAG status to patient]... it's been the most enormous difference... this actually seems to have concentrated their minds” (Provider)

“Explaining the pathway approach to patients is a fundamental to getting buy in and improved outcomes – patients need to understand the pathway approach – otherwise they'll go elsewhere” (Practice Owner)

What becomes clear is that as patients understand the pathway it reinforces it and makes patients more co-operative with the requirements of pathway processes such as recall times.

10.5.2 Staff Buy In

Likewise a buy in from staff, a cohesive and comprehensive understanding of the pilot system throughout the practice, can hold some influence over access position.

*“I think the message has been getting through to patients via various different people, means, education...the message is being reinforced throughout the whole team”
(Performer)*

“The practice manager did not appear to understand the concept of the RAG rating... [the receptionist] she didn’t understand the concept of RAG rating and she didn’t know the difference between an OHA and an OHR” (E&L observation)

Some practices, typically those in stratum ‘A’, have what would be regarded as a strong buy in where the concept and delivery of the pilot is understood and practiced throughout the dental practice, whereas others are much more fractured in their understanding, communication, and thus ultimate all round buy in.

10.6 Management Typology

Like most organisations the culture and implicit strategies are often dictated, be it intentionally or otherwise, by an underlying managerial persuasion or typology. The data showed these typologies to exist in varying extents across access strata and in some cases could be setting the tone, perpetuating, or merely highlighting symptoms of an underlying driver toward organisation and delivery that ultimately contributes to access. Typologies were understood within the subthemes of ‘proactive’ and ‘reactive’, though there was also potential to extend to an ‘inactive’ subtheme.

10.6.1 Proactive

The proactive typology refers to the anticipatory management, decision making, and recognitions through creations and subsequent control of situations. It was found that the proactive typology was reflected in numerous characteristics. Notable is how some practices had operated in ways similar to those required by the pilot prior to enrolling.

“Probably, we have done this many years... for our practice, you know we done more or less the same way. Is not a lot of change” (Provider)

This seemed to make transition to the pilot much easier as many processes, such as skill mix or focus on prevention, were already in place. Proactive typologies also demonstrated foresight in areas such as performance management.

*“Then what’s motivated them... I’ve suddenly got the dentists to switch on to the portal so they’re actually looking at their stats [patient numbers]... and suddenly when I’ve linked their pay to a portal, they’ve suddenly gone ‘right I’m looking’ and they’re looking at it regularly... some dentists have jumped in straight away and caught back up again”
(Provider)*

Performance management is evident in not just the observation and action upon stats, but also made clear through regular meetings, cross practice team meetings, regular staff memos and email updates and, importantly, regular actions and motivation to take stock and make changes. It was these practices that were in a position to be much more alert to patient access figures.

Furthermore, a respect for and understanding of the commerciality of a dental practice was evident amongst most of these proactive practices. Some referred to their advertisement efforts

explicitly as “marketing” and these marketing measures, in some cases, were regarded as some of the key reasons behind increases in access. Operationally and strategically as part of the day-to-day many of these practices altered opening hours, extending them to weekends, cutting lunches, and actively taking a more refined look at their schedules.

10.6.2 Reactive

Contrastingly, reactive typology practices were typically making decision changes, or recognising, responding and altering their approach to occurrences rather than creating or controlling them. Some practices found that to maintain access they needed to find additional space or increase hours, however their budget then restricted them. Similarly, some practices were not as perceptive of their performances or lacked use of measures in place such as checking the portal to keep track of progress.

“The practice owner was also aware of a decrease in patient numbers but did not realise the extent” (E&L observation)

One characteristic common in both these typologies is pragmatism provoking a realisation of a need to change, to varying extents, and alter the ways in which the practice is run and the ways in which they approach the pilot to ensure its success.

10.7 Patient Focus

Patient quality is the flagship of healthcare but as commercialisation, operational necessities, and government goals shift and become more prominent in the industry, any new dental contract must allow for a balance of these requirements both ethically and efficiently. Patient focus deals with the extent to which the operation of the pilot practice is geared around the patients’ wishes and expectations rather than any perception of obligations to “whip through” patients and increase access; the balance between patients’ needs and business needs. Similar approaches were seen across all three strata, many practices felt compelled to provide a form of check-up when conducting an interim care appointment because it seemed the “right thing” or was “normal” even though this was not necessarily required of them.

“I just feel obliged I’ve got to look round everything... it’s what the regulators might expect anyway... [Interviewer: Do you think the patient has an expectation?] That’s another part of it as well” (Dentist)

“Payments for the ICs make the appointment more awkward not to carry out a check-up” (Dentist)

This was done for various reasons, most prominent being the need to satisfy the expectations of a patient to have some form of tangible care. In Section 9 it was reported that the pathway was sometimes seen as a rulebook, but this diminished with time as dentists became more confident about overriding the system. These data suggest that patterns of prescribing treatment may be deep seated, involving beliefs around moral obligations to patients who are co-payers of care. Prescribing treatment via care protocols offers more of a bio-medical approach to care and potentially conflicts with values concerned with individually tailoring care in a patient-focused way.

Similar characteristics involved providing a more tailored, be it longer or shorter, appointments for certain patients based on their needs, familiarity, or tenure with the practice or dentist.

“Occasionally you’ll get a patient who needs half an hour... of teaching, coaching... encouragement... we are giving them [dentists] the freedom to decide but if people are taking the mickey then of course you know we are able to look at that” (Provider)

“When it tells them to come back in 24 months and I do tell the patient... but they aren’t very comfortable with the 2 years recall so then I create an ICM of 12 months” (Performer)

It is these kinds of measures taken, where practices are confident of overriding the pathway that highlight how the patient can be somewhat centric to the pathway delivery in the real world setting. Further measures such as patient forums and feedback systems existed to varying extents across practices and reflect a patient focus and a likely wish to feed in patient expectations and comment in a more refined care pathway delivery.

10.8 Streamlining

10.8.1 Natural Efficiencies

Natural economies and efficiencies are not unusual in organisations. It emerged that all practices were negotiating and seeing some form of improvements in various aspects of the pilot compared to when they began. These natural efficiencies included greater familiarity with computer systems, processes and targets.

“[Any new] associate will be coming in to a system where the pilot has been going on for a while so I think there’d be more of an advantage” (Performer)

Most practices being able to cut their assessment times after an initial increase is a common expression of these natural efficiencies.

10.8.2 Active Streamlining

More pertinent to access differences, however, are the active streamlining measures that practices were undertaking and that were generating notable efficiency advantages.

“We use our own [templates]... for all the treatments and tailored it to what I want so it fits in then with this pathway” (Dentist)

“I don’t know how we can sort this problem, but in our practice we try to every six months change our approach to all this” (Provider)

The measures were predominantly seen in stratum ‘A’ practices. Measures included the development of an in house questionnaire to streamline the often long-winded social and medical history forms. Similarly, protocols such as only signing for alterations on the aforementioned forms. Other measures included tailoring treatment and pathway to the patient if they have known them many years, developing dentist or practice specific templates to work from, having active goals and a finger on the pulse of change with regular reviews of processes, as well as strategically negotiating appointment times.

10.9 Analysis of Access using Themes

In discussing and subsequently composing a reasonable archetype for the practices which are maintaining their list sizes and those which are seeing them drop, we have drawn on a cross case analysis of the examples outlined by the findings described above.

Although the themes that emerged from the data are reasonably distinct there is an underlying link between them. The practices whose list sizes are being maintained, or where they are only reducing slightly, typically demonstrate a proactive management typology and often a desire to improve. The more reactive typologies are more typical in strata 'B' and 'C'. Management typologies are an influencer for the all other emerging themes particularly in terms of the reinforcement and support of their particular characteristics. A practice's management typology may influence list size in numerous ways; measures such as performance management, continuous improvement focus, day to day operational changes, and a respect for required commercial activity all help to incentivise and steer practices in certain directions which may or may not create the foundations and an environment favourable to delivering a throughput of patients. It is worth noting of course that the direct financial drivers that would be operational in real life (money per patient) are either not present or of a very small scale in the pilots.

In terms of skill mix, stratum 'A' practices were typically more able to let go and delegate the pathway to skill mix staff, whilst they also seemed to show a greater understanding of the benefits that a skill mix deployment can bring much more than those of other strata. As you move across strata, the willingness, proactive and positive attitude toward skill mix delegation somewhat deteriorates, as do capabilities in accommodating the skill mix (Table 2). This latter point is not always necessarily under a practice's control, especially in terms of physical space and the availability of adequate training for staff. Practices that stood out benefited from their ability to afford a skill mix and gear it strategically to the needs of the practice, and in some cases advantages were achieved by having the physical space to reflect the care pathway tangibly in the practice.

Gaining buy in from both staff and patients emerged as a notable theme because of the way such commitment greases the gears of pathway communication throughout practice. The stronger cases, typically but certainly not uniquely in strata 'A', depicted practices where most, if not all, members of staff were knowledgeable and understanding of the care pathway and the pilot, and where noticeable measures were undertaken to communicate this knowledge and understanding to the patient. In cases where buy in was weaker there was fragmented staff understanding and lack of patient communication, conjuring the potential for a culture to emerge that is not fully committed to the change and damaging to a practice's long term focus. In an extensively people focused business, communication and commitment are necessary canons of good practice, and by having a robust and pragmatic buy in from staff and patients there is scope for efficiency to be bolstered.

Having patient services balanced with the business needs within the delivery of the pathway was reasonably consistent across all practices, however notable variations did occur in stronger performing practices where they were much stricter about assessment times and explicitly conveyed a willingness to "whip through" certain patients quickly. Rather than highlighting an interrelationship between an overt patient focus in assessments and poor access figures,

balancing patient services across these strata serves to highlight a value in maintaining a pragmatic balance of managing patients' expectations with the obligations of a contract.

Of particular interest prior to this report was the identification of measures taken by practices, unique to them or popular across strata, which actively addressed the problem of access and patient list size. Whilst there were widespread naturally occurring efficiencies as practices familiarised with the pilot and the necessary processes, more active streamlining measures were mostly circumscribed to strata 'A'. It is likely that underpinning these is a proactive management typology that affords their initiation and maintenance. The measures were advantageous to the practices that utilised them, though in some cases these were unique to that practice and it remains to be seen whether a generalisation of all the measures could provide a blanket effect on access. Nevertheless, identifying, initiating, and consistently reworking or heading up streamlining can likely have a noticeable impact on access.

10.10 Overall comments and conclusions

Research of this type clearly has its limitations. Interviews and analysis were conducted by two separate parties so lines of questioning during collection of the data will have been less focused than they could have been. Similarly, qualitative research such as this would typically benefit from further fieldwork interviews once themes are coded to some certainty, in other words a process to check back. Time has precluded this additional step at this stage but the evidence so far is consistent with other observations (for example the work reported in Section 9).

Nevertheless, these limitations should serve only as caveats for the data and should not take away from what the findings and conclusions ultimately point toward, which is an insightful qualitative reasoning behind differences in the change in list size for practices over the period of the pilot. In the absence of clear statistical explanations for the variation, these data are vital to understand what is observed and point the way to some of the features of a contract model and how the environment can be prepared to make any transition as smooth as feasible.

To summarise, it was found that those practices whose patient access was least impacted were driven by proactive management styles, utilised their skill mix effectively, gained practice wide buy in and understanding for the pilot, balanced patient expectations with the needs of contractual obligations and typically demonstrated measures to actively streamline their processes. Contrastingly, those practices whose access was negatively impacted most showed no explicit driving management typologies or ebbed towards reactive mentalities. They, typically, had fractured utilisation of skill mix, buy in, and showed little noticeable activity toward streamlining their processes to harmonise the practice with contract requirements. Although these patterns were consistent across the range of changes in patient list sizes represented in the 12 practices studied, we cannot infer that where list sizes were maintained, the quality of care for patients was necessarily always better. In short though, the data clearly indicate that underpinning the variations in changes in patient list sizes observed is the culture and implicit management strategies of the practices involved.

Some very specific points emerged from the data as exemplars of successful implementation strategies that may prove useful:

10. Findings - Cross case analysis of differential falls in access

- Training – An increased local availability of appropriate training courses for EDDNs would potentially help greatly with the ability to utilise skill mix
- The possible benefit of raising public awareness around the new traffic light system which may help to reduce practice-level resources committed to this communication
- Active streamlining - notable measures that practices employed to cope with the pathway were those which streamlined the process. Examples of these are as follows and may be copied by other practices seeking to minimise impact on access:
 - Signing for revisions only on Medical and Social history forms
 - Developing in house templates, unique to the practice's characteristics, processes and patients, to deal with the pathway more efficiently.
 - Practice and team wide buy in and understanding of the care pathway to enable fluid communication
 - Target setting and statistics observation through systems such as the portal or other easily accessible in-house systems, to ensure that certain goals are part of the daily, weekly, or monthly focus.

11. Summary

This report brings together a real mix of data sources, and these should not be seen in isolation from each other. There is an underlying set of messages starting to emerge around what is working well and what is not. There is a need to learn from the successful and the not successful, to ensure the good is retained and the weaknesses firmly addressed.

Given the importance of a universal system to the NHS, the reduction in list sizes and the way this may affect access is important and needs to be fully understood. However a reduction in list sizes is also to be expected in a system which lacks the economic leverage that is part of any working service. It is also to be expected in a new system (including an IT requirement) which is introduced cold and where the new pathway is by necessity, untried. This is what a pilot is for.

One of the most important and telling images in this report is figure 3 in Section 6, which illustrates clearly the potential for practices to be the architects of their own destiny, a theme explored in subsequent sections. It shows a large number of Type 2 and 3 pilot practices demonstrating a modest reduction in list size and a few with very little change, but also a few which have seen very dramatic changes. It is not unreasonable to expect that good preparation around the introduction of the OHA and pathway, a more efficient pathway and the more refined and developed software, combined with some real financial drivers, should be able to manage out the modest changes. However, the small number of practices that experienced much greater problems in maintaining a throughput of patients is an important minority. The findings from Sections 9 and 10 give a clearer understanding of the factors that underpin this sort of response and some clear indications of what might need to be done.

What emerges from Section 10 in particular is that the extent to which practices adapt successfully to the new system, is influenced significantly by the whole approach to change and management of the practice as an organisation. This is something which is not easily identified when we look at statistics relating to the various practices involved in the pilots, but is nevertheless an important factor when we consider the implications for implementation across the country.

The other striking finding is very different and no less important, and it is a clinical one. For those patients that we can follow through the pathway, there do appear to be real clinical benefits in terms of a reduction of risks and the improvement of health. These are difficult to demonstrate with absolute confidence away from a clinical trial (which the pilots explicitly are not) and we have little or no comparable data from general dental services outside the pilot, but the follow through data are all pointing very clearly in the right direction. The data on periodontal disease are particularly encouraging. Furthermore, although there is some variation, practices do appear to be broadly meeting the challenge of treatment for disease and the approach of calculating some simple metrics to monitor this simply appears to be very viable. We have little data yet on more advanced rehabilitation treatment and we need to understand better what is happening to those patients where we have no evidence of an OHR.

The challenge now is to identify in detail the steps that will maintain the capacity of the service and maximise the appropriate use of the pathway.

Some specific key learning points are described below, grouped under headings which broadly represent some of the priority areas for further investigation and development.

11.1 The pathway and clinical care

- There is evidence from all relevant sources that patients and dentists continue to like the concept of the pathway.
- There is evidence that risks are being managed and reduced through the pathway.
- There is also good evidence that routine treatment for disease is being provided and that oral health is benefitting, although there is variation.
- We know little yet about more advanced care.
- There is evidence that different dentists are using the RAG rating in very different ways. This is something that needs greater clarity, specifically the prime purpose of the RAG score needs to be decided and the scoring adapted to fit.
- There is scope to further refine the pathway approach and to better match the software to the pathway. This manifests in a number of ways including the appropriate use of ICs and the RAG rating.
- Making sure that the risk rating is balanced with the care that follows is critical. If the effort to prevent disease is significantly greater than the effort to treat it, no matter what the lifetime benefits, in the short term it will not appear to make sense. Being clear about the purpose of the RAG rating (patient motivation, dentist information, contract management or something else) and then adjusting it to match its purpose is important.
- There is also considerable potential to make the software quicker to use and less time consuming particularly if the data used for monitoring are at tooth level rather than surface level. Chart data must be at surface level so the point and means of conversion is an important consideration.

11.2 Adapting to the new arrangements

- Adaptation to the new arrangements, including the concept of the pathway and adaptation to the software as a tool is a dynamic process.
- The speed with which practices are able to adapt will affect the comfort and the finances of the practices, the quality of service and access for patients because time wasted as a result of delaying changes will soon start to show.
- At a practice level, buy in from all of the staff helps immeasurably. Both of the qualitative studies detected huge variation in this area, and this impacted the comfort of the transition for the practice. Where all staff understood and bought into the arrangements, the new system appeared to be more comfortable and easier to operate.

- A process to identify the best steps to support early adoption of good practice is a high priority for everyone (dentists, DH, patients and the taxpayer) and would hugely benefit from support and input from professional bodies.

11.3 Skill mix

- Skill mix use is a very important consideration. Both qualitative studies identified this. Some practices have changed and reaped the benefits, but not all practices can change easily. Smaller practices will find it more difficult simply because of space considerations.
- It is not just the presence of skill mix that is important but the ability to use it well.
- It is very important to understand that this is not just about therapists. Extended duty dental nurses provide a huge opportunity under the pilot system and are being used successfully. The training is quick and inexpensive and once trained EDDNs can work unassisted. Expanding the opportunity for EDDNs to train may be of some importance.

11.4 Data and feedback for contract monitoring and patient information

- The ability to collect data and undertake some very simple, quick and clinically meaningful measures of performance (for example the BPE changes and the treatment data for caries) was invaluable as a means of ensuring good clinical practice.
- Matching needs to treatments is the approach to contract performance measurement of the future and is much more clinically meaningful than anything currently used. Such measures are good for commissioners, for patients and for practices.
- A mechanism to produce these at the push of a button is a key step.
- Work with the public to prepare them for any change would probably help practices.

Appendix 1 - Evidence and Learning Reference Group – Terms of Reference

Purpose

The primary purpose of the Reference Group is to support the capture of evidence and learning from the dental contract pilots that have been established as part of the Department of Health's Dental Contract Reform Programme.

The Dental Contract Reform Programme is seeking to develop a new contract model and way of working which shifts the focus of NHS dentistry from treatment and repair to prevention and oral health. Seventy dental contract pilots are underway in practices across the country. The pilots are testing a new clinical pathway and new remuneration models. The aim of the pilots is to inform a new contract model where remuneration will be based on capitation (paying based on number of patients cared for and their needs) and quality of care (clinical outcomes, patient experience and patient safety) rather than paying based on units of activity.

The evidence and learning from the pilots will be sought in two broad ways:

- Conducting focus groups and surveys with stakeholders including patients, dental practitioners, practice managers and commissioners. The areas the focus groups and surveys will explore will include the clinical pathway being tested in the pilots, the practicalities of delivering the pathway and the potential remuneration models for a new contract. An external research agency is being appointed to conduct focus groups and surveys.
- Conducting data analysis and modelling to explore the impact of the pilots on clinical activity, oral health and access. The data analysis and modelling will also explore finance issues in terms of the factors upon which a weighted capitation model would need to be based and the affordability of the care pathway model being tested.

The evidence and learning reference group will:

- act as an independent source of expertise upon which the programme can draw to help shape the approach to capturing evidence and learning – individual members may be engaged to provide expertise in relation to specific areas of work
- provide an independent overview of the process of evaluation.
- provide independent advice around interpretation of emerging results.
- provide challenge to ensure the approach to capturing evidence and learning is robust and findings are representative.

Membership

The following are being invited to be members of the reference group:

Professor Jimmy Steele (Chair)	Newcastle University – Head of Dental School
Elizabeth Lynam	Department of Health – Head of Dentistry
Helen Miscampbell	Department of Health – Dentistry policy
Daisy Wild	Department of Health - Data analysis
Marianne Scholes	Department of Health – Data analysis
Serbjit Kaur	NHS England - Deputy Chief Dental Officer
Alice Benton	NHS England – Commissioner
Sue Gregory	Public Health England
Anna Ireland	Public Health England
Eric Rooney	Public Health England
Christopher Allen	British Dental Association
Jane Moore	British Dental Association
Philippa Risely Prichard	Dental Contract Pilot practitioner
Janet Clarke	Birmingham Community Dental Services
Cam Donaldson	Glasgow Caledonian University - Health economist
John Wildman	Newcastle University - Health economist
Rebecca Harris	Liverpool University – Health services research
Ruth Gasser	NHS Business Services Authority - Dental services
Darren Williams	NHS Business Services Authority - Dental services
Keith Ellis	Dental Contract Reform Programme

Governance and Accountability

The Reference Group will be chaired by Professor Jimmy Steele. The Reference Group will report to the National Steering Group for the Dental Contract Reform Programme. Reports will be provided by Professor Steele who is a member of the National Steering Group.

Frequency of meetings

The working group will meet as and when necessary to fulfil its role.

Conduct of meetings

Actions arising from working group meetings will be issued within seven days of the meeting.

Review of terms of reference

The terms of reference for the working group will be reviewed at any time deemed necessary by the Chair.

Appendix 2 - Analysis exploring how different factors might be impacting access

This appendix describes the initial quantitative analysis undertaken to understand the variation in the impact on access across the pilots.

The first step was to develop a list of quantifiable factors which it was believed may have affected the ability to maintain patient numbers. These are presented below, grouped under the following themes: practice characteristics, patient needs, pre-pilot activity patterns, and approach to implementing the care pathway. Due to the data quality issues it was not possible to include some key factors in the latter category regarding care under the pilot such as rates of interim care appointments and treatment volumes.

Variables considered

Practice characteristics

- Size of practice as measured by whole time equivalent dentists
- Does the practice have a single dentist?
- Is the practice a corporate?
- Proportion of hours spent on private work (pre-pilot)
- UDA value

Pre-pilot activity patterns

- UDA delivery percentage in the pre-pilot year 2010/11
- Pre-pilot courses of treatment (CoTs) per patient per year (patients measured as the number on the practice's capitation list)
- Pre-pilot UDAs per patient per year ... (patients measured as the number on the practice's capitation list)
 - ... for children
 - ... for adult patients who are exempt
 - ... for adults patients who are non-exempt
- Pre-pilot re-attendance rates within less than 3 months (Jul 2010 – Apr 2011)

Patient needs

- Patients living in the 10% most deprived areas
- Patients living in the 30% most deprived areas
- % of patients with red RAG status
- % of patients with green RAG status

- % of all assessments which are urgent (since start of pilot)

Implementation of care pathway

- Time reported in online survey 12 months into pilot for:
 - adult OHAs
 - adult OHRs
 - child OHAs
 - child OHRs
- Software provider
- Change in NHS commitment hours (pre-pilot to 2012/13)

Access measure

Access was measured as the number of patients on a practice’s three year capitation list (“capitated patients”). This was in order to be consistent with the remuneration model which itself was designed to allow a margin on the maximum NICE recommended recall interval of two years.

The analysis focussed on the change in the number of capitated patients over the first 18 months of the pilots, comparing for each practice the level at 18 months with the level at the start. This was expressed as a percentage and termed the practice’s “access position” at 18 months.

Changes in capitated patient numbers in Type 1 pilots were not considered valid for this analysis. This is due to the fact that it takes up to three years for a capitation list to respond fully to a change in contract value. Type 1 pilots had all had changes in contract value within three years prior to the start of the pilot and their capitation lists were consequently expected to be responding to these during the pilot period. This meant that the impact of the pilot itself on access could not be isolated. The analysis was therefore limited to the 24 practices of Type 2 and 3 only.

These practices were grouped into three strata according to their access position at 18 months to facilitate the analysis, and the number in each are presented below.

	A: any increase in access and up to 5% decrease, 18 months into pilot	B: greater than 5% decrease in access to up to 10% decrease, 18 months into pilot	C: greater than 10% decrease in access, 18 months into pilot
Type 2 pilots	4	6	2
Type 3 pilots	3	5	4
All pilots	7	11	6

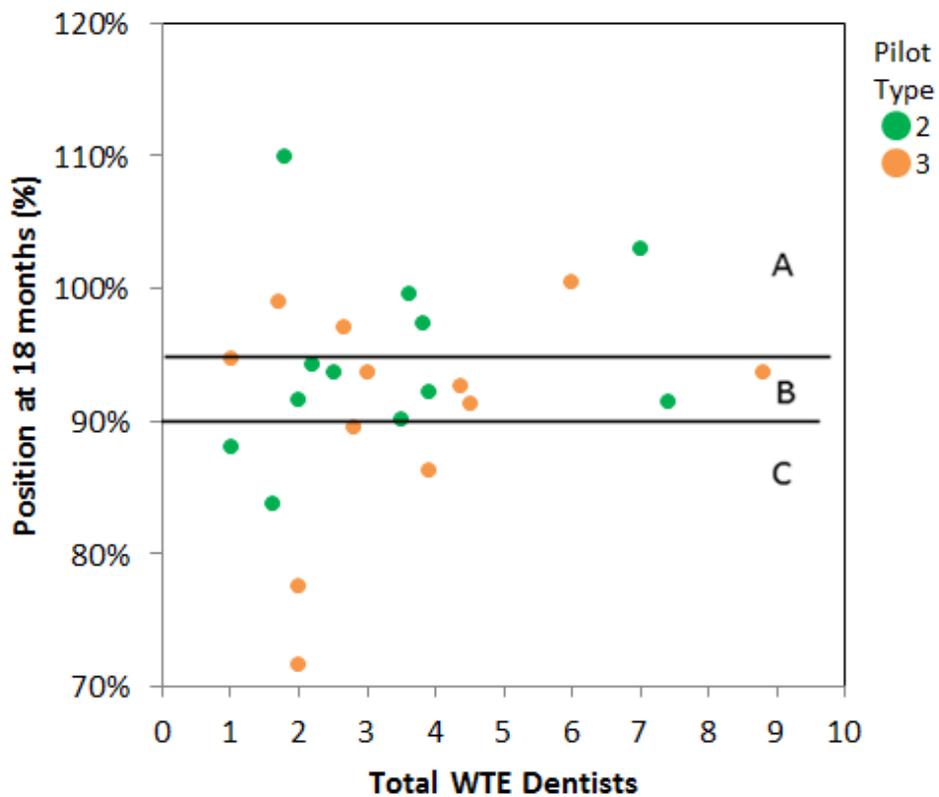
Bivariate analysis

The analysis first considered the effect of each variable in turn. The results are presented below in the form of frequency tables by strata for category factors and scatter plots for continuous variables.

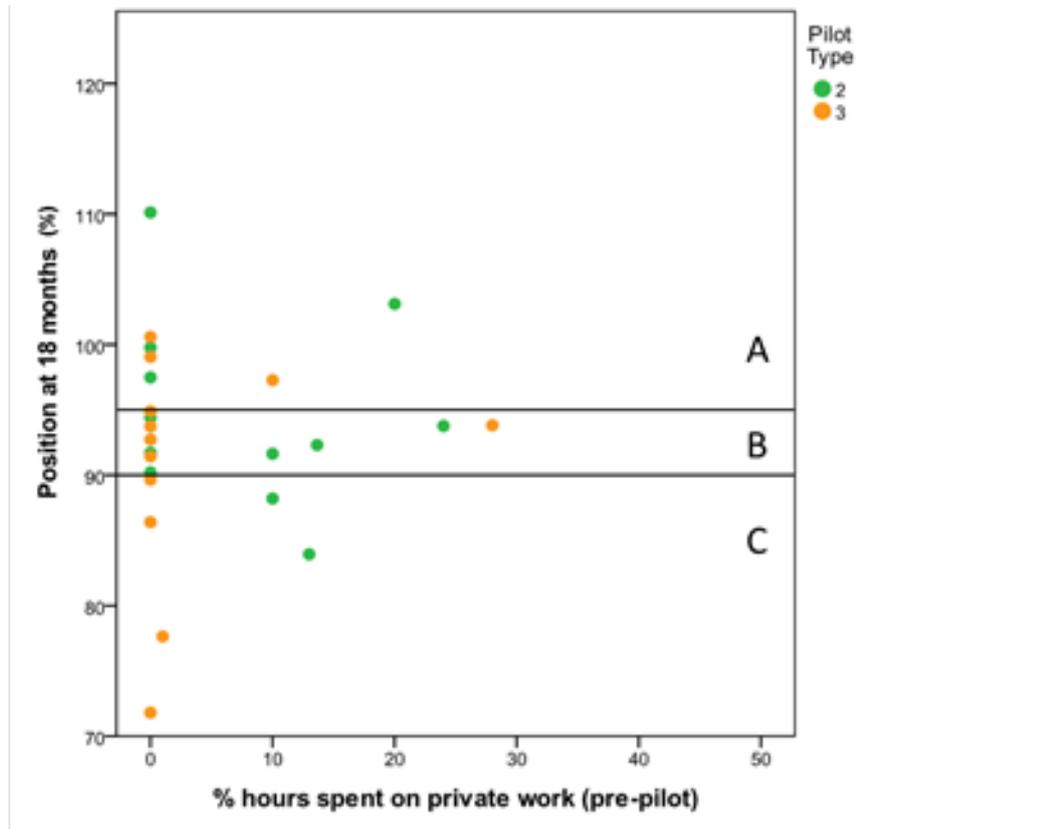
Practice type

Strata	A	B	C
Number of corporate (% of strata)	0 (0%)	5 (45%)	1 (17%)
Number with single dentist (% of strata)	0 (0%)	1 (9%)	1 (17%)
Practices in strata	7	11	6

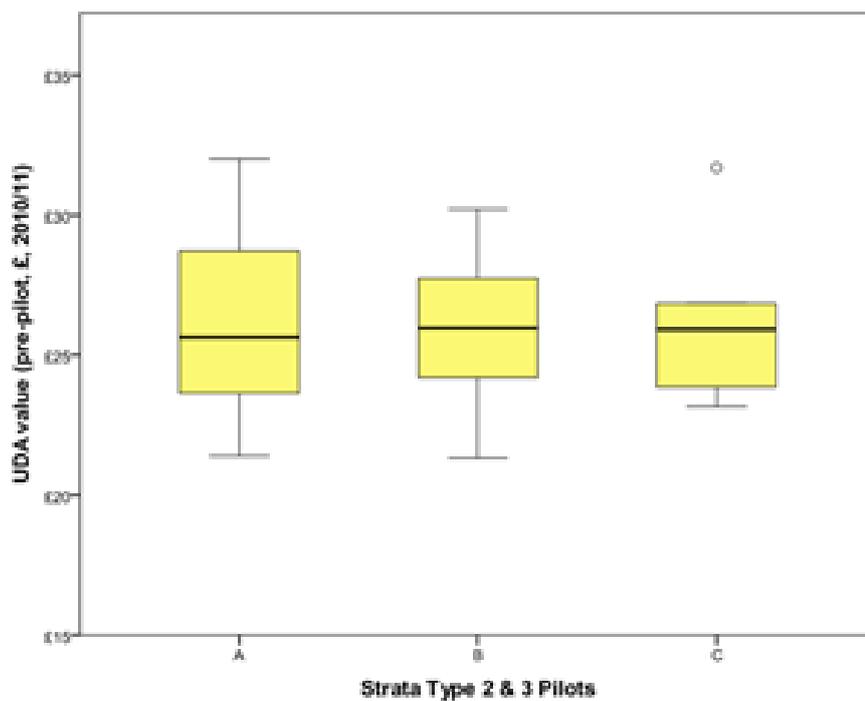
Whole time equivalent dentists



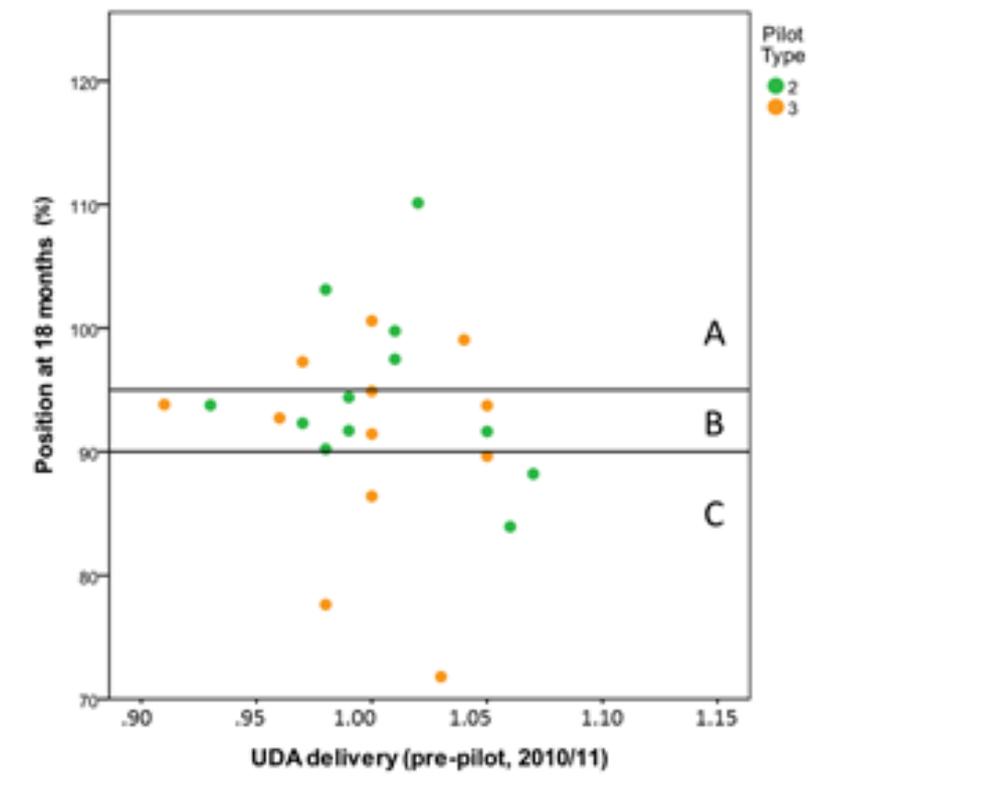
Private work



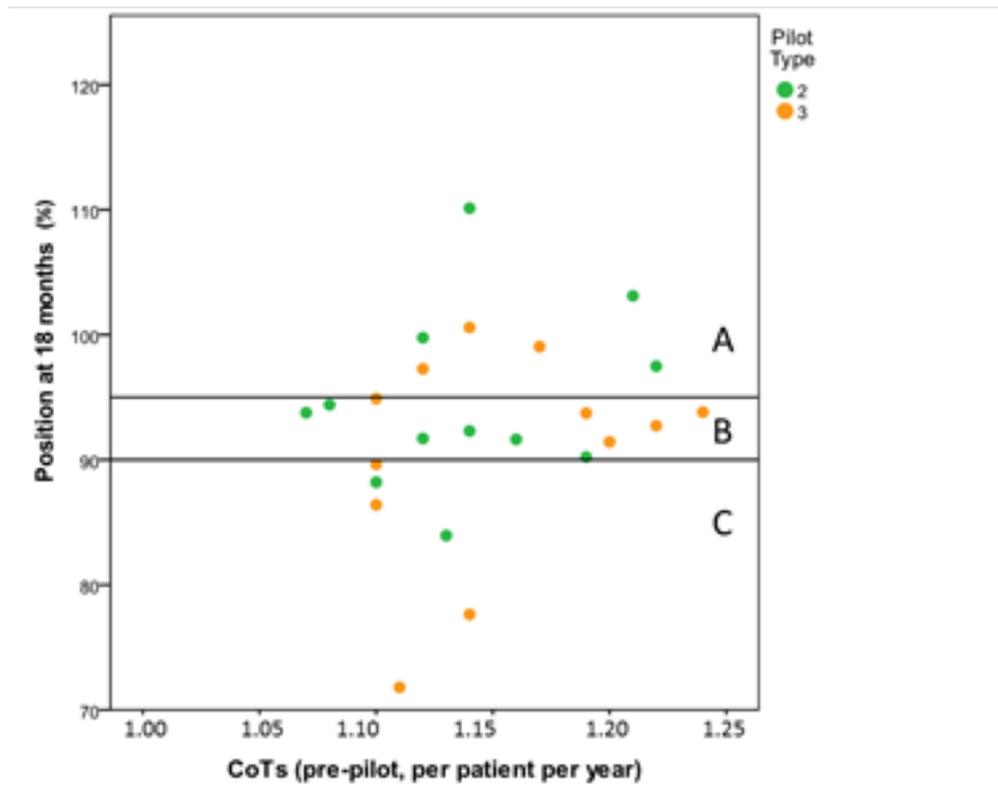
UDA value



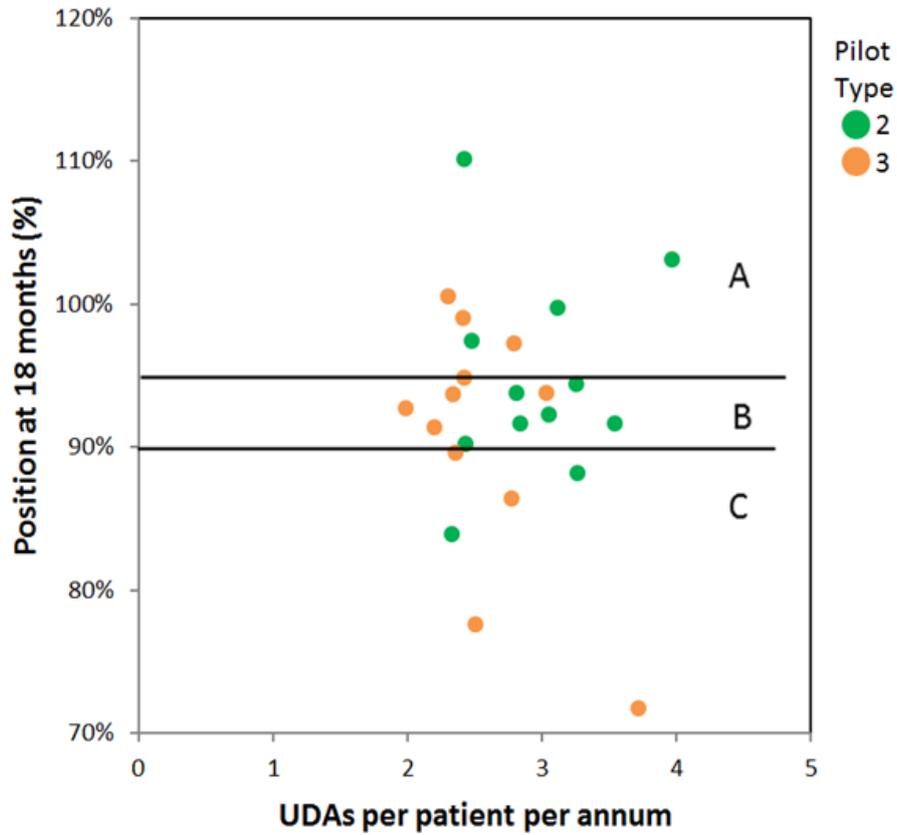
UDA delivery in 2010/11



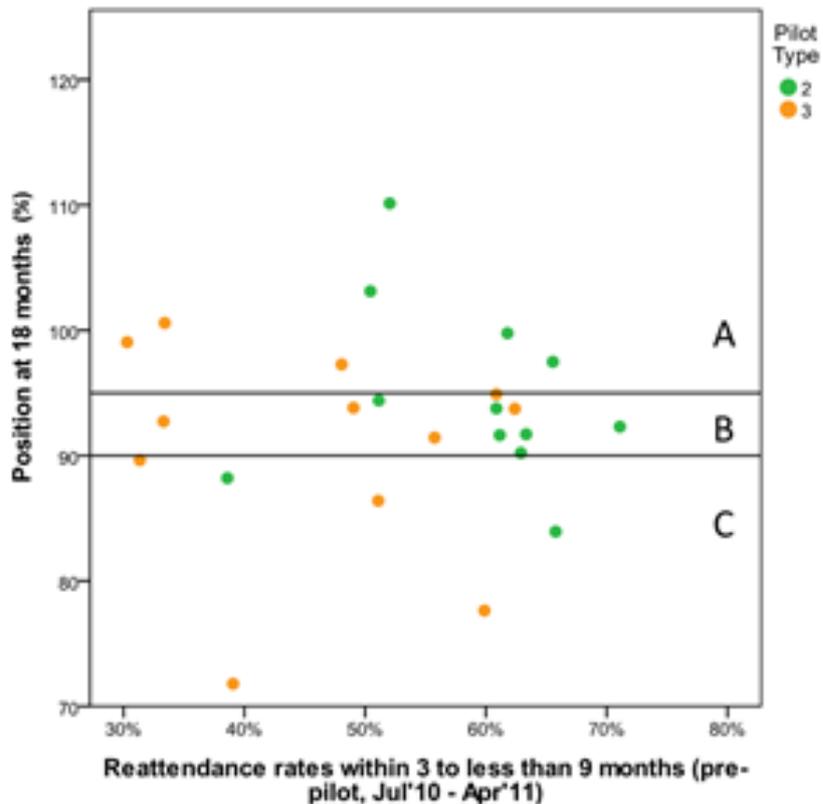
Pre-pilot courses of treatment per patient per year (patients defined as number on 3 year capitation list)



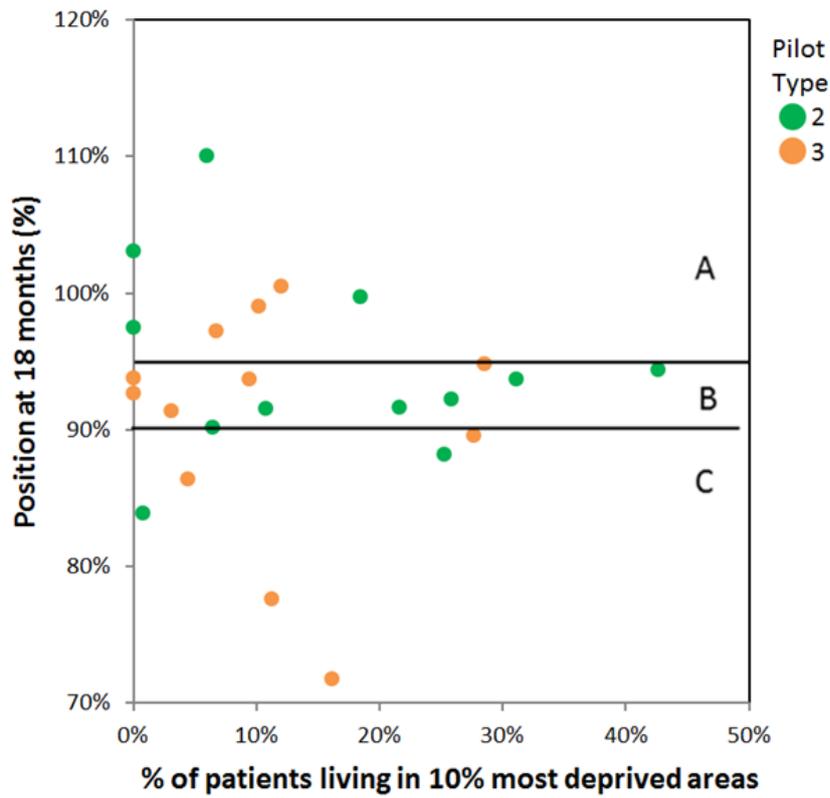
Pre-pilot UDAs per patient per year (exempt patients)



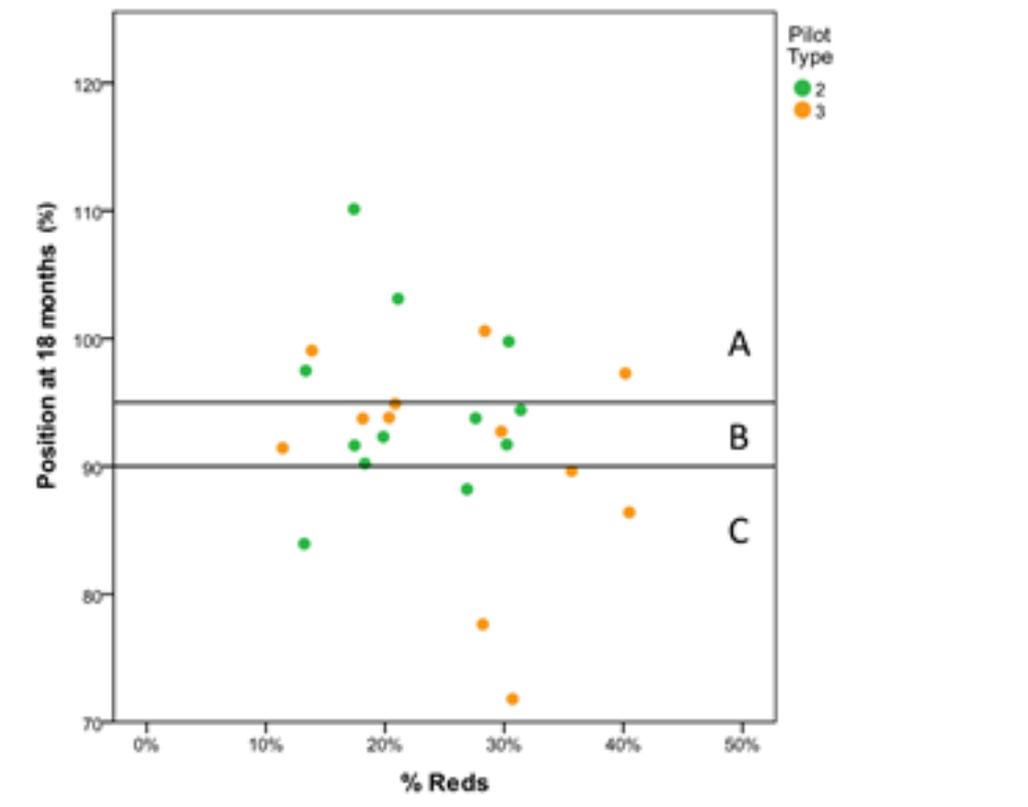
Pre-pilot re-attendance within 3 months



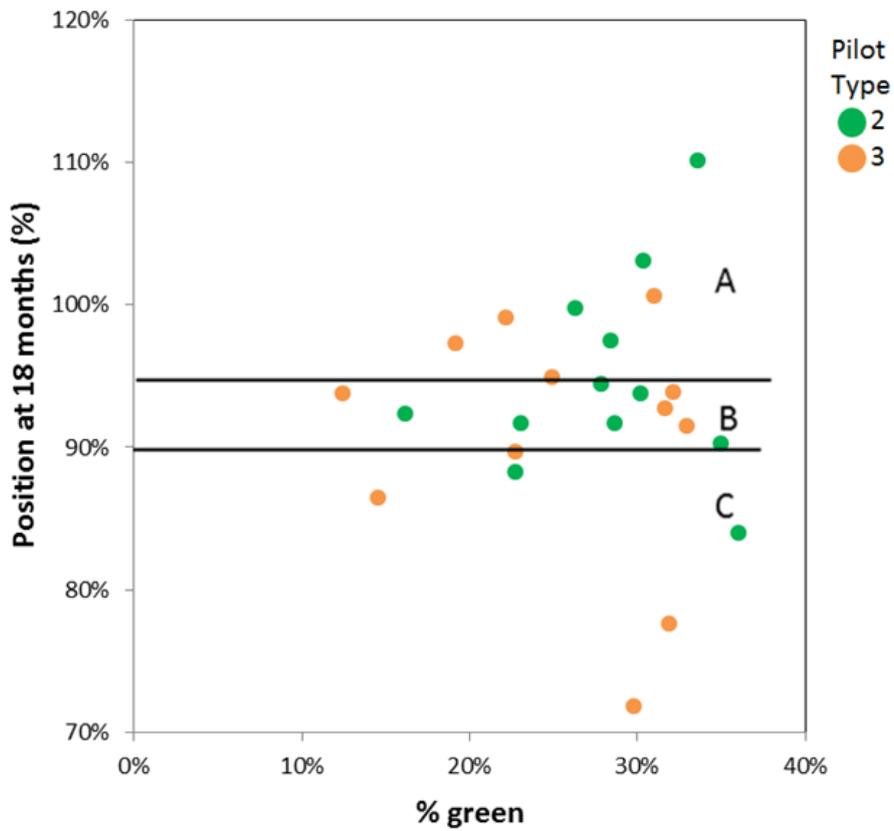
Percentage of patients living in the 10% most deprived areas in England



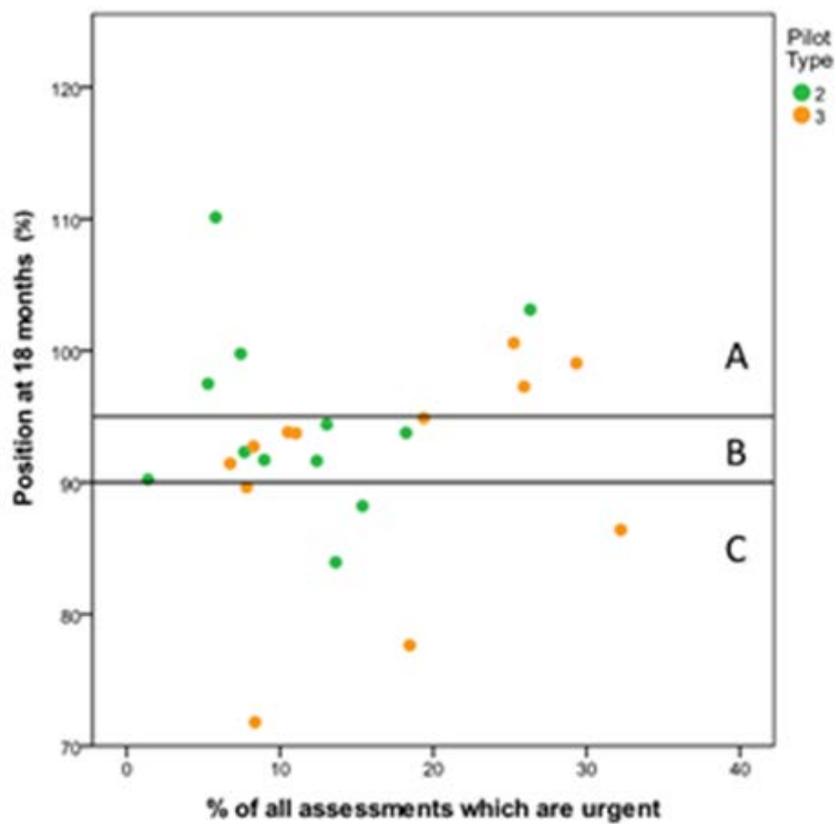
Percentage of patients who have red RAG status



Percentage of patients who have green RAG status



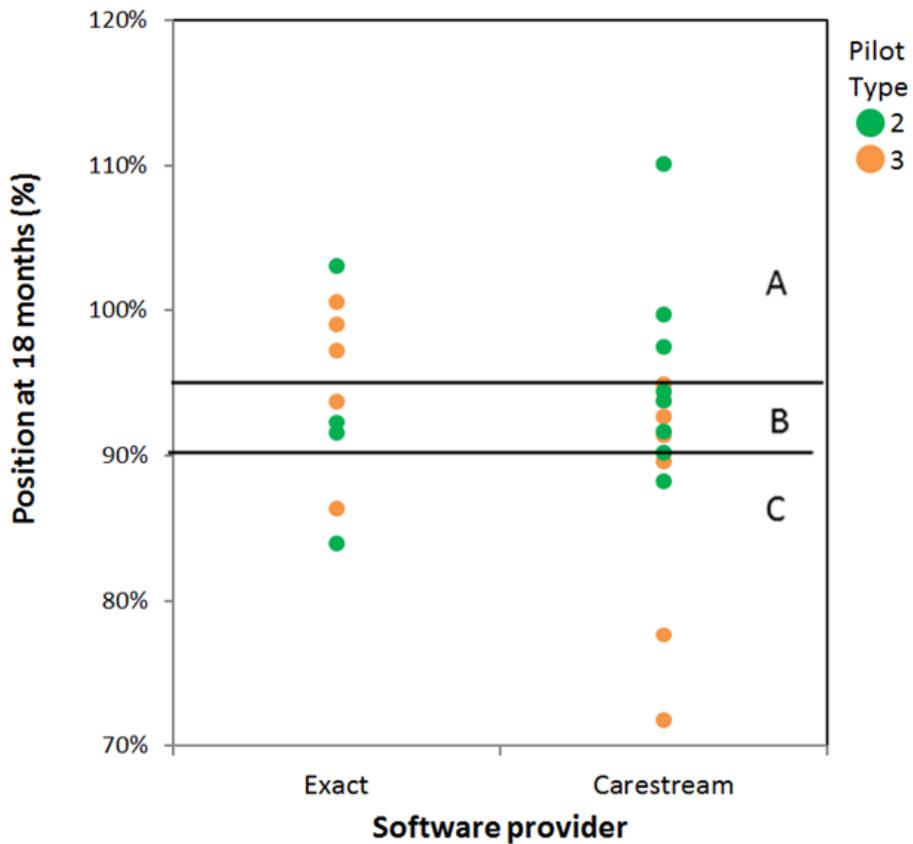
Percentage of all appointments which are urgent



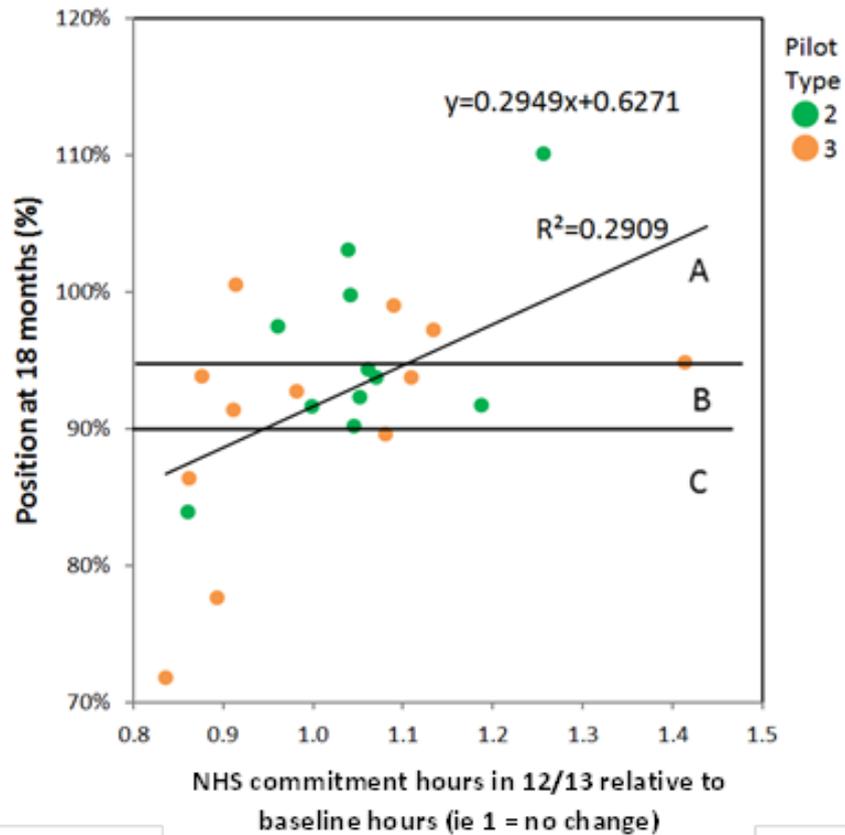
Time reported for adult OHA

	% of strata		
	A	B	C
10 mins	29%	9%	0%
15 mins	14%	9%	67%
20 mins	43%	82%	33%
25 mins	0%	0%	0%
30 mins	14%	0%	0%
Practices in strata	7	11	6

Software provider



Change in commitment hours from pre-pilot baseline to 2012/13



Summary of bivariate analysis

As the charts suggest and statistical analysis confirms, change in NHS commitment hours is the only one of the identified variables that has a clear, if weak, relationship with changes in patient numbers. This suggests either that there are interactions between these variables which explain more of the variation, or that the impact on access is dominated by other less tangible factors or individual circumstances or events which can't be modelled.

Multiple variable analysis

We attempted to undertake multivariate regression to see if this would reveal a combination of factors which could explain the variation but concluded that 24 data points was not sufficient to generate a statistically significant model given the number of factors we believe are at play.

As an alternative, we undertook a less formal exercise to establish if groups of factors helped to explain differences in access changes. This involved highlighting practices' positions relative to other practices on the key variables and scrutinising the data for patterns, looking particularly at practices with combinations of factors which one might expect would make it easier to maintain access. However this did not provide any further insights, except to reaffirm the hypothesis that there are other currently unquantified or less tangible factors that have affected practices' ability to maintain patient numbers and to highlight the need for a deeper and more broad-minded investigation of practices' responses to the pilot.

Appendix 3 - Patient experience DQOF indicator points thresholds

The table below illustrates the patient experience DQOF indicator points thresholds for 2012/13 and 2013/14 alongside the pilot performance against these indicators in 2012/13.

Patient experience indicator	DQOF points	Distribution of scores	2012/13 DQOF points thresholds	2013/14 DQOF points thresholds
Patients reporting they are able speak and eat comfortably (%)	30	85-90% - 2 practices 90-95% - 7 practices 95-100% - 59 practices	<45% = 0pts 45% - 55% = 15pts >55% = 30pts	<75% = 0pts 75-85% = 15pts, >85% = 30pts
Patients satisfied with the cleanliness of the dental practice (%)	30	90-95% - 5 practices 95-100% - 65 practices	<90% = 0pts 90%-95% = 15pts >95% = 30pts	Unchanged
Patients satisfied with the helpfulness of practice staff (%)	30	90-95% - 11 practices 95-100% - 59 practices	<90% = 0pts 90%-95% = 15pts >95% = 30pts	Unchanged
Patients reporting that they felt sufficiently involved in decisions about their care (%)	50	85-90% - 4 practices 90-95% - 25 practices 95-100% - 41 practices	<90% = 0pts 90%-95% = 25pts >95% = 50pts	<85% = 0pts 85%-90% = 25pts >90% = 50pts
Patients who would recommend the dental practice to a friend (%)	100	85-90% - 2 practices 90-95% - 23 practices 95-100% - 45 practices	<90% = 0pts 90%-95% = 50pts >95% = 100pts	Unchanged
Patients reporting satisfaction with NHS dentistry (%)	50	85-90% - 1 practice 90-95% - 18 practices 95-100% - 51 practices	<90% = 0pts 90%-95% = 25pts >95% = 50pts	Unchanged
Patients satisfied with time to get an appointment (%)	10	65-70% - 5 practices 70-80% - 20 practices 80-90% - 26 practices 90-100% - 19 practices	<70% = 0pts 70% - 85% = 5pts >85% = 10pts	Unchanged

Appendix 4 - Sample of practices selected for in-depth studies

The table below shows the range of the pilot practices that were strategically selected for in-depth studies to inform the cross case analysis of differential falls in access (explored in Section 10 of the report).

There were five Type 2 pilots, five Type 3 pilots and two Type 1 pilots.

The table shows for each pilot practice:

- Impact on access over first 18 months of piloting in terms of list size:
 - Increase or decrease less than 5%
 - Decrease between 5% and 10%
 - Decrease greater than 10%
- Contract value for general dentistry:
 - Less than £400K
 - Between £400K and £700K
 - Greater than £700K
- Skill mix (whether the practice uses any skill mix) – Yes or No
- Percentage of patients whose home postcode is in most deprived 10% of areas:
 - Less than 5%
 - Between 5% and 10%
 - Between 10% and 50%
- Percentage of adult patients whose RAG status at OHA/OHR is red:
 - Between 10% and 20%
 - Between 20% and 35%.

Pilot Practice	Impact on access	Contract value	Skill mix	Percentage of patients living in most deprived areas	Percentage of patients Red at OHA/OHR
A	Increase or decrease less than 5%	Less than £400K	Yes	Between 5% and 10%	Between 10% and 20%
B	Increase or decrease less than 5%	Greater than £700K	Yes	Between 10% and 50%	Between 20% and 35%

Pilot Practice	Impact on access	Contract value	Skill mix	Percentage of patients living in most deprived areas	Percentage of patients Red at OHA/OHR
C	Increase or decrease less than 5%	Between £400K and £700K	Yes	Between 10% and 50%	Between 20% and 35%
D	Increase or decrease less than 5%	Between £400K and £700K	No	Less than 5%	Between 10% and 20%
E	Increase or decrease less than 5%	Less than £400K	No	Less than 5%	Between 10% and 20%
F	Increase or decrease less than 5%	Less than £400K	Yes	Less than 5%	Between 20% and 35%
G	Decrease between 5% and 10%	Between £400K and £700K	Yes	Between 10% and 50%	Between 20% and 35%
H	Decrease between 5% and 10%	Between £400K and £700K	No	Between 5% and 10%	Between 10% and 20%
I	Decrease between 5% and 10%	Greater than £700K	Yes	Less than 5%	Between 20% and 35%
J	Decrease greater than 10%	Greater than £700K	No	Less than 5%	Between 10% and 20%
K	Decrease greater than 10%	Between £400K and £700K	Yes	Less than 5%	Between 10% and 20%
L	Decrease greater than 10%	Less than £400K	Yes	Between 10% and 50%	Between 20% and 35%

Appendix 5 – Alternative text for figures and graphs

Figure 2.1 – An overview of the care pathway for patients engaging in continuing care

The figure shows four stages in the pathway:

- Oral Health Assessment records key information on 4 important dental conditions
- Risk is assessed based on patient and clinical information which results in a Red, Amber or Green risk status
- Preventive Actions for the patient and dental team are advised
- Oral Health Review date is advised based on risk and NICE guidelines.

Figure 5.1 – Flow of data in pilot system

The figure shows how FP17 and appointment data flows from Data entry to the Practice IT system to the Data warehouse to Reports/analysis.

There are issues with data entry caused by:

- Lack of understanding of what is required
- Lack of willingness to do as required
- User interface not being intuitive
- Lack of direct feedback loops to check validity of what is entered.

There are issues with chair-side IT caused by:

- Misinterpretation of the specification
- Excessive requirements for data
- Reliance on information sharing between practices, NHS BSA, software suppliers and programme support.

There are issues with data processing caused by:

- Large volume of data making testing difficult
- Rules for what data to expect are difficult to define as a result of data fields being new.

Figure 6.1 – 24 month patient numbers across all pilots

The figure shows how patient numbers across all pilots as a whole were stable in the year prior to the pilots starting but fell steadily in the two years from the time the pilots started up until August 2013. The drop in patient numbers by August 2013 was around 17%.

Figure 6.2 – Change in patient numbers across Type 2 and Type 3 pilots

The figure is described in the main body of the document. The pilot that showed a sharp and sudden increase after several months of gradual reduction increase patient numbers relative to the baseline CEWCP from around 97% in October 2012 to around 111% in April 2013. In the majority of cases patient numbers had fallen by July 2013 by up to around 18%. There are two pilots where patient numbers have dropped between 30% and 40%.

Figure 6.3 – How expected recall intervals are comparing with actual intervals

The figure is described in the main body of the document.

Figure 7.1 – How RAG status is changing between OHA and OHR

The figure is described in the main body of the document.

For adults (based on a cohort of 22,474) at OHA there were 6% greens, 67% ambers and 26% reds and at OHR there were 11% greens, 65% ambers and 24% reds.

For children (based on a cohort of 57,672) at OHA there were 57% greens, 32% ambers and 11% reds and at OHR there were 59% greens, 31% ambers and 9% reds.

Figure 7.2 – How RAG status is changing between OHA and OHR for each RAG type

The figure is described in the main body of the document.

For those adults red at OHA (based on a cohort of 15,224) 4% were green at OHR, 38% amber and 58% red.

For those adults amber at OHA (based on a cohort of 38,735) 9% were green at OHR, 78% amber and 12% red.

For those adults green at OHA (based on a cohort of 3,713) 54% were green at OHR, 40% amber and 7% red.

For those children red at OHA (based on a cohort of 2,454) 19% were green at OHR, 45% amber and 36% red.

For those children amber at OHA (based on a cohort of 7,191) 34% were green at OHR, 56% amber and 10% red.

For those children green at OHA (based on a cohort of 12,829) 81% were green at OHR, 15% amber and 4% red.

Figure 7.3 – How Periodontal and Caries RAG status is changing between OHA and OHR

The figure is described in the main body of the document.

For those adults whose periodontal RAG status was red at OHA (based on a cohort of 10,729) 8% were green at OHR, 28% amber and 64% red.

For those adults whose periodontal RAG status was amber at OHA (based on a cohort of 30,744) 23% were green at OHR, 69% amber and 8% red.

For those adults whose periodontal RAG status was green at OHA (based on a cohort of 16,199) 69% were green at OHR, 28% amber and 3% red.

For those adults whose caries RAG status was red at OHA (based on a cohort of 5,305) 20% were green at OHR, 50% amber and 30% red.

For those adults whose caries RAG status was amber at OHA (based on a cohort of 37,805) 15% were green at OHR, 78% amber and 7% red.

For those adults whose caries RAG status was green at OHA (based on a cohort of 14,562) 67% were green at OHR, 27% amber and 6% red.

Figure 7.4 – How prevalence of BPE code 3s and above changes between OHA and OHR

The figure is described in the main body of the document.

The change in the prevalence rates between OHA and OHR for different IMD groups was as follows:

- IMD Group 1 (based on a cohort of 6,813) – 22% to 14%
- IMD Group 2 (based on a cohort of 6,749) – 24% to 15%
- IMD Group 3 (based on a cohort of 14,410) – 26% to 18%
- IMD Group 4 (based on a cohort of 6,312) – 24% to 17%
- IMD Group 5 (based on a cohort of 6,538) – 27% to 19%
- IMD Group 6 (based on a cohort of 5,152) – 28% to 20%
- IMD Group 7 (based on a cohort of 5,587) – 30% to 22%
- IMD Group 8 (based on a cohort of 4,611) – 31% to 22%
- IMD Group 9 (based on a cohort of 4,355) – 37% to 27%

Figure 7.5 – How mean BPE sextant score is changing between OHA and OHR

The figure is described in the main body of the document.

The change in the mean BPE sextant score between OHA and OHR for different IMD groups was as follows:

- IMD Group 1 (based on a cohort of 6,813) – 2.2 to 1.9
- IMD Group 2 (based on a cohort of 6,749) – 2.2 to 1.9
- IMD Group 3 (based on a cohort of 14,410) – 2.3 to 2.0
- IMD Group 4 (based on a cohort of 6,312) – 2.3 to 2.0
- IMD Group 5 (based on a cohort of 6,538) – 2.3 to 2.0
- IMD Group 6 (based on a cohort of 5,152) – 2.4 to 2.1

IMD Group 7 (based on a cohort of 5,587) – 2.4 to 2.1

IMD Group 8 (based on a cohort of 4,611) – 2.4 to 2.1

IMD Group 9 (based on a cohort of 4,355) – 2.5 to 2.2

Figure 7.6 – Percentage of patients with BPE code 3s or above at OHA and OHR

The figure is described in the main body of the document.

The change in the prevalence rates between OHA and OHR for different age groups was as follows:

18 to 25 (based on a cohort of 3,039) – 6% to 3%

26 to 35 (based on a cohort of 6,018) – 14% to 8%

36 to 45 (based on a cohort of 10,306) – 21% to 14%

46 to 55 (based on a cohort of 12,927) – 28% to 20%

56 to 65 (based on a cohort of 13,564) – 34% to 24%

66 to 75 (based on a cohort of 10,417) – 33% to 23%

76 & over (based on a cohort of 4,781) – 33% to 22%

Figure 9.2 - Schematic of the key themes with respect to the decision support (IT) software and the impact upon key stakeholders

The figure illustrates that IT support can provide value and impact on:

- Patients with respect to experience and waiting times
- The practice with respect to business and operation
- The dental team with respect to workload and workforce.

Appendix 2 – Bivariate analysis

Whole time equivalent dentists

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

Private work

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

UDA value

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

UDA delivery in 2010/11

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

Pre-pilot courses of treatment per patient per year (patients defined as number on 3 year capitation list)

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

Pre-pilot UDAs per patient per year (exempt patients)

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

Pre-pilot re-attendance within 3 months

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

Percentage of patients living in the 10% most deprived areas in England

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

Percentage of patients who have red RAG status

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

Percentage of patients who have green RAG status

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

Percentage of all appointments which are urgent

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

Software provider

The graph does not illustrate any clear relationship between this variable and changes in patient numbers.

Change in commitment hours from pre-pilot baseline to 2012/13

The graph illustrates a weak relationship between this variable and changes in patient numbers. The greater the increase in NHS commitment the higher the patient numbers compared with the baseline position.