Scottish Dental Needs Assessment Programme (SDNAP)

Oral Health and Dental Services for Children
Needs Assessment Report

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*The opinions expressed here are personal and not those of MDDUS

1 Key Findings and Recommendations

1.1 Key findings

1.1.1 Oral Health Improvement, Inequalities and Demography

1. In recent years, child poverty has increased in Scotland and the highest levels of poverty can be found in families with young children. Health inequalities between children living in poverty and their peers in more affluent areas of Scotland are significant and start early. This has huge implications for dental health preventive initiatives and services. Dental health has improved significantly, but a core of “hard to reach” children remain and inequalities are still persisting.

1.1.2 Information

2. While there is a wealth of evidence on tooth decay in primary school children, there is no national information regarding tooth decay for children of preschool or secondary school age. Also, there is no information on other dental conditions for children, such as molar incisor hypomineralisation.

3. The current GP17/SDR system is not appropriate for gathering information regarding the work output/activity of paediatric dental care in the PDS and often does not facilitate appropriate treatment, especially for specialists, as the SDR does not include many procedures a specialist might provide. It also does not reflect any work in multidisciplinary clinics for children with hypodontia, cleft lip and palate or significant medical conditions.

1.1.3 Service Provision

GDPs

4. GDPs felt that the current business model is unworkable. They indicated that patient cooperation is a major barrier to treatment. GDPs believed that they are not remunerated appropriately for time spent on provision of dental services to child patients. They felt that SDR fees are inadequate where children’s ability to cooperate impacts on the time taken for treatment.

5. DCPs are currently underutilised in the provision of dental care for children.

PDS

6. Normally referrals were made to the PDS for more than one reason but the most common reason for referral of children to the PDS is for management of anxiety and phobia (61.5%) followed by treatment planning for children requiring extraction under GA/Sedation (52.7%) and severe childhood caries (42.2%). As children are commonly referred for anxiety, dentists should also be aware that it may be a manifestation of underlying wider wellbeing concern.

7. Many staff working in the PDS are dentists/clinicians with an interest and enhanced skills in treating children and some have obtained relevant additional postgraduate qualifications.

8. Only three NHS Boards in Scotland employ specialists in paediatric dentistry in their PDS. (NHS GG&C, NHS Lothian and NHS Fife WTE 4.12 on March 2016). In some areas, the PDS may not be making the best use of staff and their skills e.g. some specialists are employed as dental officers, rather than specialists.

9. It was perceived that the number of specialists in training is inadequate to maintain succession planning for any possible service development.

HDS

10. The commonest reason for referral of child patients to the hospital service was for the management of severe caries. The second most commonly referred patient group as a whole were patients with medical conditions who were at high risk, either from dental disease or from treatment to manage oral disease e.g. oncological, cardiac, haematological conditions.

11. More than half of the children referred to Glasgow Dental Hospital from within the NHS Board area were from the most deprived SIMD quintile (see inequalities).

12. The total WTE for Specialists & Consultants in Paediatric Dentistry in Scotland is 9.3, although this figure excludes academic consultants. Numbers in the HDS are small, so utilisation of this resource should be carefully monitored to ensure efficient use. Elsewhere in the UK, an alternative model of consultants working in the community has been developed, which may help maximise access to this highly specialised resource.

13. Staff numbers in the HDS are small in relation to the child population and the need for treatment, and are stretched. Management often ask consultants to undertake extra clinics to meet the waiting time guarantee and prospective cover for colleagues' leave has become the norm. There appears to be stress in all parts of the profession.

Patients

14. Patients preferred to be seen locally rather than travelling to a dental hospital. Some GDPs appeared to be unaware of the local PDS specialist service.

15. Specialist care for children in the PDS was highly valued and was considered an essential service by the participants interviewed. Some patients preferred the PDS specialist service to the hospital service because it is easier to access. They reported that the hospital service is good but busy and they had to wait longer to be seen.

16. In some hospitals, patients experienced delays due to communication/administration problems.

17. In some dental hospitals, patients seemed unaware of the risks of GA, with some parents of child patients who have undergone GA reporting that they have not been made aware of any risks. However, for many of the patients referred for GA with pain and sepsis who are dentally anxious, there is no other realistic option other than GA. Therefore, the risk benefit ratio is very different from most other areas of dentistry

18. Parents of some children with additional support needs felt that their children would cope better if treated at the familiar setting of school rather than being referred to hospital.

1.2 Recommendations

1.2.1 Oral Health Improvement, Inequalities and Demography

1. Despite improvements, poor oral health inequalities persists, so water fluoridation should be considered, with appropriate robust evaluation.

2. Population-based oral health improvement programmes with a primary care focus, such as Childsmile, must continue.

3. Population programmes should be sustainable and adaptable to demographic changes, such as increasing deprivation and the recent influx of refugee children.

1.2.2 Information

4. Improving data quality and capture centrally for all dental health services for submission to ISD should be considered as a priority, in order to monitor delivery and ensure a more efficient service.

5. It is essential that NDIP is maintained to inform the oral health of children and service delivery/improvement.

6. The scope of NDIP should be extended and consideration should be given to include information regarding decay for children of preschool and secondary school.

7. Opportunities for use of routine data for surveillance should be investigated. Consideration also should be given to include information regarding other dental conditions for children e.g. MIH, in national oral health surveillance.

1.2.3 Service Provision

8. The majority of routine paediatric care should take place in the GDS. GDPs should proactively refer patients to specialist services when indicated.

9. The current system of remuneration through item of service is perceived to be unfavourable. Therefore consideration should be given to make payments taking into

account the time-consuming nature of providing routine treatment for many children.

10. PDS and HDS referral criteria should be developed nationally and agreed at NHS Board level (see Appendix 1 for the proposed national referral protocol), so that there is more consistency across all NHS Boards in how child patients are accepted and treated.

11. The PDS should be developed nationally as an important part of paediatric care, forming the bridge between the GDS and HDS. The middle grade of HDS staff should also be expanded.

12. Local managed clinical networks (MCN) should be established and should be based in primary and secondary care. These should include consultants, specialists and non-specialists, therapists and hygienists (working to their full scope of practice) and middle tier career grade PDS and HDS staff.

13. Various pathways should be developed across Scotland, for the following groups:

    a. An accessible care pathway for trauma patients

    b. A pathway of support to promote attendance and follow-up of children who are identified at risk of dental disease, utilising the Childsmile DHSW network and emphasising primary prevention.

    c. Dental assessment for medically compromised patients should be standardised, evaluated and reported nationally so as to improve uptake.

    d. A pathway for patients with pain who should be prioritised.

1.2.4 Workforce and training

14. A national workforce strategy for paediatric dentistry should be developed. This should include review of consultant and specialist posts to meet service demands and need. It should also establish appropriate training posts and facilitate succession planning. The total WTE of specialist and consultants in NHS Scotland is 13.42 which is 1:66,566 of the

child population (in contrast to the BSPD recommendation of 1 specialist to 20,000 children). However, the total of WTE 13.42 for Scotland does not include the academic consultant workforce.

15. DCPs are currently underutilised and must be enabled to work to their full scope of practice.

2 Background and Context

Oral health is defined as the ‘standard of health of the oral and related tissues which enables an individual to eat, speak and socialise without active disease, discomfort or embarrassment and which contributes to general well-being’ (Department Of Health, 1994). Good oral health is an important component of overall general health and quality of life. Oral disease is still a major public health problem in high income countries (Petersen, P.E, 2008). In Scotland, dental health is widely used as an 'indicative measure' of children's general health. This is because it reflects a key 'outcome' of good parental care during the pre-school period (Scottish Government, 2014b). Dental health has an impact on child wellbeing because of the consequences of dental diseases e.g. pain, loss of sleep, reduced quality of life and disruption to a child’s education.

The Scottish Government’s implementation of the Children and Young People Scotland Act (2014) has put child wellbeing at the centre of health and social policy (Scottish Government, 2014a). The links between dental health and deprivation are well established and one of the aims of this report is to ensure that paediatric dental services in their widest context are sufficient to support the aims of the Act. This is the first piece of legislation since the Disability Discrimination Act (2003) likely to impact or and change the behaviour of health professionals.

In Scotland, one in four children (200,000) live in families whose income is 60% below the average. The highest levels of poverty can be found in families with young children. The evidence shows that the gap in outcomes for children living in poverty and those who do not remains wide in terms of standard of living, quality of life, opportunities and educational achievement. In Scotland, health inequalities between children living in poverty and their peers are significant and start early (Save the Children, 2014).

The Scottish Government investment in the national Childsmile programme to prevent childhood dental decay has provided savings of £6 million in dental treatments between 2001-2002 and 2009-2010 (Scottish Government, 2013) and started to reduce the gap between affluent and deprived communities. Whilst there have been improvements in the oral health of children, there remains a group of children, mostly in deprived areas, who are hard to reach. There are still significant numbers of children who require dental extractions under general anaesthetic (GA) and this remains the most common reason for children being admitted to hospital (Information Services Division, 2015c). As these children often have complicated social care needs, there can be a requirement for specialist paediatric

dental services. In addition, more children are now living with complex medical conditions than in the past further necessitating the need for the specialist paediatric dentistry.

In the recent past, the North of Scotland (NoS) region reviewed their specialist paediatric dental services and found them to be inconsistent. The specialist or consultant input was variable across the six NHS Board areas of Grampian, Highland, Tayside, Orkney, Shetland and Western Isles. There was also little specialist paediatric input in the Public Dental Service (PDS), although this was also the case for other specialist dental expertise (North of Scotland Planning Group, 2014). Other regions of Scotland also reported that specialist paediatric dentistry service staffing levels were not adequate to meet the need and therefore patients were waiting longer to complete a treatment course. However, they were not necessarily waiting longer to start the treatment, as this is monitored nationally through a waiting time target.

This children's oral health needs assessment, as part of the Scottish Dental Needs Assessment Programme (SDNAP), will evaluate the current children's oral health services, particularly the specialist paediatric dental service in Scotland as defined below. This report will take into account factors such as deprivation and the changing/improving oral health epidemiology among children due to preventive initiatives by Scottish Government. This report will also make recommendations for future service development.

Paediatric Dentistry is defined as the practice, teaching, and research into the comprehensive and therapeutic oral health care for children from birth to adolescence, including care for children who demonstrate intellectual, medical, physical, psychological, and/or emotional problems (BSPD, 2009).

3 Aim, Objectives and Methods

3.1 Aim

The aim is to conduct a needs assessment of oral health and dental services provision for children in all NHS Boards across Scotland, identify probable gaps in service and make recommendations.

Health Needs Assessment (HNA)

HNA is defined as "a systematic method of identifying the public health, health/social care needs of a population and making recommendations for changes to meet these needs" (Wright 2001). Stevens and Raftery described the common approaches to assessing population needs for health care. These are characterised as the epidemiological, corporate and comparative approaches to HNA (Stevens & Raftery 1994) (see Table 1).

Table 1: HNA Approaches and Work Involved

HNA approaches	**Work involved**
Epidemiological	Description of the problem: Incidence and prevalence; Availability, effectiveness and cost-effectiveness of interventions/services, Possible models of care, Outcome measures.
Corporate	Assessment of stakeholder perception, which includes professional and patient/public groups.
Comparative	Comparative study of the services/service models provided in one region with those available elsewhere.

The aim of a HNA is to maximise appropriate effective health care/policy, minimise both the provision of ineffective health care/policy and the existence of unmet need. HNA provides a systematic framework for undertaking a complex and important task in an evidence based way.

3.2 Objectives

These are

- To describe current oral health epidemiology among children in Scotland.
- To describe the current oral health /dental services provision for children in Scotland.
- To determine the demand for oral health /dental services for children in Scotland.
- To make an analysis of the current workforce in dental services for children.

- To determine the perceptions of service providers concerning the current paediatric dentistry model, including DCP services, and propose new pathways and models of care.
- To determine the perceptions of service users concerning the current paediatric dentistry model.
- To identify gaps in and between the services.
- To make future recommendations.

3.3 Methods

A range of methods were used

- Data collection from ISD (hospital data and primary care)
- National Records of Scotland (formerly the General Register Office for Scotland).
- Ascertaining number of specialists/trainees
- GDP and DCP survey
- Semi structured interviews/questionnaires with workforce
- Focus groups/questionnaires with patients of a range of service users
- Prospective audit of referrals received
- Survey of Clinical Directors, including activity
- Analysing oral health inequalities using National Dental Inspection Programme (NDIP) data - children from the poorest areas with greatest burden of disease
- Data from Childsmile National Headline Data Report

3.4 Scope and Limitations

This report will look at dental services provided to children by the NHS. This includes treatment provided in primary and secondary care settings by GDS, PDS and HDS (please see section 5 for more details on these services).

Private practice provision is out of the scope of this report.

Cleft Care Scotland Service provided to cleft lip/and palate patients is not specifically included in the report, as it is managed nationally.

The age definition of "child" can vary depending on the context. For the purposes of this report, a child is anyone who is under the age of 18. However, it is acknowledged that the age range might vary from service to service, and some reports or data sets may use different age ranges.

3.5 Ethical considerations

Ethical approval was sought from the West of Scotland Research Ethics Service in November 2012. The response of the committee stated that ethical approval from an NHS Research Ethics Committee was not required as the project was considered to be service evaluation and not research.

Participants were informed about the response from the ethics committee and informed consent was obtained from each participant prior to taking part in the needs assessment.

4 Introduction to Children's Oral Health

4.1 Child Population and Demography

Scotland has a child population of 1,096,763 (0-18 years) (National Records of Scotland, 2014) with 18.5% of total population estimated to be under 16. The number of births registered in Scotland in 2014 was 56,725, which is 711 (1.3 per cent) more than in 2013. It has been reported that this was the first rise in the number of births following five consecutive annual decreases. Between 2012 and 2037, the number of children aged under 16 is projected to rise only by five percent, from 0.91 million to 0.96 million (National Records of Scotland, 2014).

In Scotland, more than 81% of the population live in urban areas (those with a population of more than 3,000), covering less than 6% of Scotland's land area, mainly concentrated in a central belt around Glasgow and Edinburgh (Office of National Statistics, 2012). Table 2 below shows the distribution of children under 17 years across Scotland.

Table 2: The distribution of children aged 0-16 years old using the six-fold urban-rural classification 2011

Rural – Urban	**Percentage 0-16years of Total Population**
Large Urban	17.4%
Other Urban	19.1%
Accessible Small Towns	19.4%
Remote Small Towns	18.4%
Accessible Rural Areas	20.0%
Remote Rural Areas	18.4%
Total % of 0-16 years	18.5%

Source: Rural Scotland in Focus, 2014

According to the State of the Nation 2014 report published by Social Mobility & Child Poverty,

- 180,000 children live in relative poverty in Scotland - 30,000 more than last year
- 200,000 children are in absolute poverty - also up 30,000 on the previous year
- 15,580 children are being looked after by local authorities which is 1.4% of the 0-17 population.

Information about children on the child protection register is as follows (Scottish Government, 2015a)

- Overall it has increased by 41% between 2000 and 2014 (from 2,050 to 2,882).

- In 2014, 53% of children on the child protection register were aged under five.
- Since 2008 there have been more children aged under five than over five on the child protection register.
- However, in 2014, there was a much larger increase in the number of those aged 5 and over than has been seen in recent years – a 15% increase from 2013.

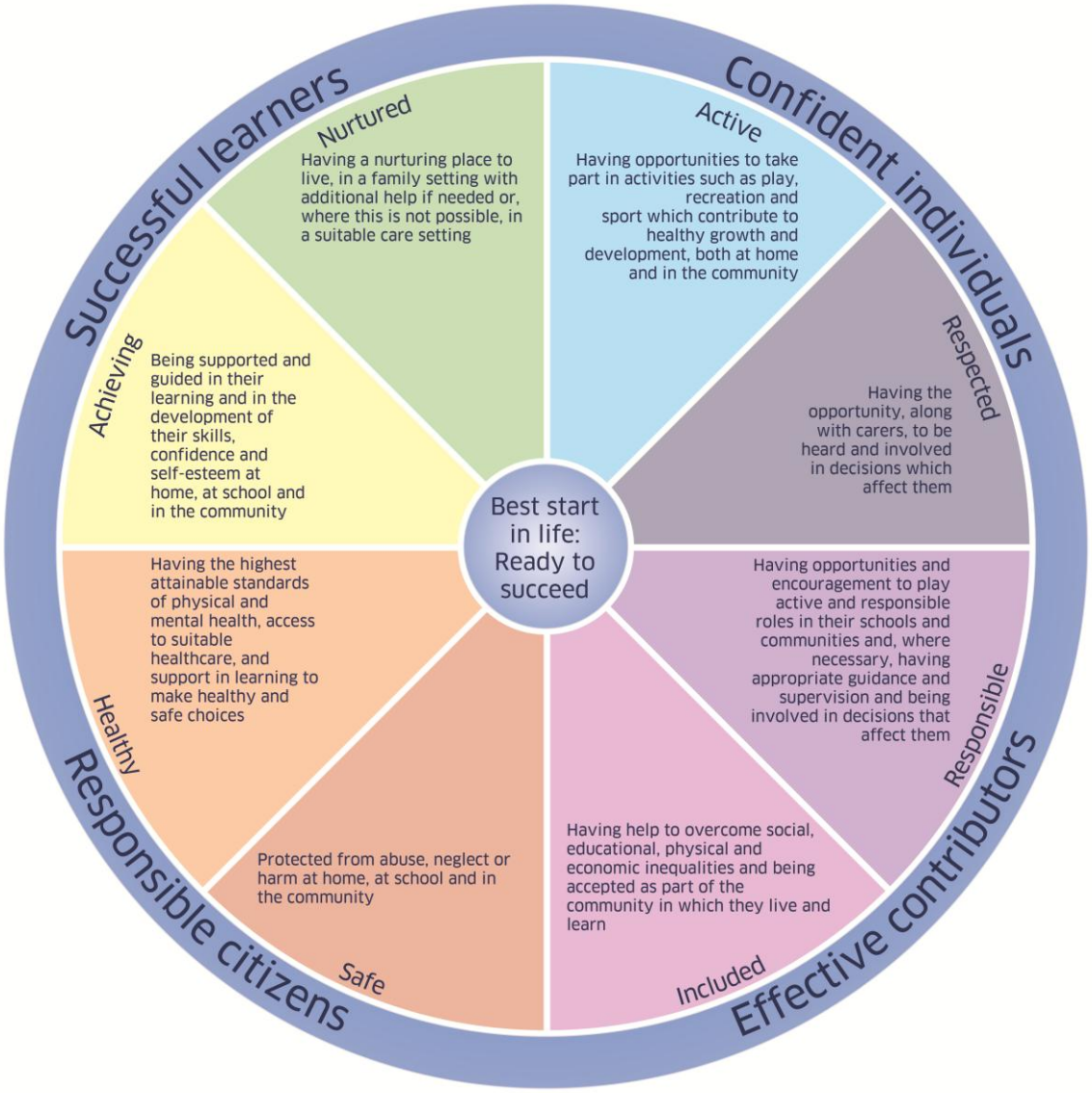
Child wellbeing is supported through the provision of a universal health programme to all children and their families, known as the Child Health Programme. It consists of elements such as formal screening, routine childhood immunisations and a programme of needs assessments and reviews. In 2014/15, the 27-30 month review for Scotland showed (Information Services Division, 2015a):

- 87% with 50,956 children had a review by the age of 3 years.
- 19% of all 27-30 month reviews, i.e. 9,682 children, were noted for at least one concern in an aspect of the child's development.
- Children from the most deprived areas were more than twice as likely to have at least one developmental concern identified (27%) than those in the least deprived areas (12%).
- Boys (24%) were considerably more likely than girls (14%) to have at least one developmental concern identified.
- 25% of children reported as 'Asian' or 'Black, Caribbean or African' had at least one developmental concern identified compared to 19% in the White Scottish ethnic group.

Children's dental health is regularly reviewed by health visitors as part of the Child Health Systems Programme (CHSP). The Universal Health Visiting Pathway in Scotland (Scottish Government, 2015b) describes the role dental health plays in their overall assessment of a child's health and wellbeing needs. This programme consists of 11 home visits to all families – 8 within the first year of life and 3 child health reviews between 13 months and 4-5 years.

The wellbeing of children and young people is at the heart of *Getting it right for every child (GIRFEC)*. In the Scottish context wellbeing is defined using the SHANARRI wheel. The approach uses eight indicators to describe wellbeing at home, in school and in the community as shown in Figure 1.

Figure 1: SHANARRI Wheel



In practice, the eight indicators are not discrete, but are connected and overlapping. When considered together they give a holistic view of each child or young person.

4.2 Common Oral Diseases of Childhood

The most common dental disease of childhood is decay (caries). This occurs when acids produced by bacteria in the mouth dissolve the outer layers of the teeth (enamel and dentine). As with other chronic diseases, dental decay is more prevalent in areas of deprivation. However, Childsmile has made some progress in narrowing the inequalities gap (see epidemiology section).

Other dental conditions occur less frequently and are as follows. However, there are no prevalence data available for Scotland.

- Dental erosion is the progressive loss of the hard component of the teeth, enamel and dentine, resulting from chemical action on the teeth, other than that which is

caused by bacteria. Causes include carbonated (fizzy) acidic drinks and consumption of acidic fruit drinks.

- Accidental damage to teeth is one of the commonest reasons for young children attending health services for treatment of trauma.
- Developmental defects of enamel arise in the developing tooth from a variety of causes, including trauma, excessive fluoride, infections and nutritional disturbances. Usually, there is minimal effect on the long-term health of the mouth.

There are a number of associated risk factors which can also impact on disease development as follows:

- Biological risk factors include nutrition and obesity, oral hygiene, fluoride levels in water and injury to teeth.
- Social risk factors include lack of access to dental care and oral health improvement initiatives due to geographical location and deprivation. Vulnerable groups e.g. children from black and minority ethnic (BME) communities, travelling communities, special needs, and looked after and accommodated children (LAAC) are also at high risk. There has also been a recent influx of refugees who could also be considered vulnerable.
- Medical risk factors include children diagnosed with a high risk medical condition e.g. Haematology, Cardiology, Metabolic, Respiratory, Psychiatric etc.
- Behavioural risk factors include children with special needs e.g. Dental anxiety, Learning disability, Autistic spectrum disorder (ASD)/Attention deficit hyperactivity disorder (ADHD) etc.

4.3 Policy and Legislation

There are several important policies and pieces of legislation which relate to children

- The Children and Young People (Scotland) Act 2014 aims to ensure that children's rights properly influence the design and delivery of policies and services. The Act will also provide legislative impetus to the implementation of the principles of the Getting it right for every child (GIRFEC) approach, including the provision of a Named Person service.

  Local authorities and health Boards are under a legal duty to develop a Named Person service which makes a Named Person available to every child and young person. The Named Person will likely be a health visitor for pre-school children and a head teacher or senior teacher with pastoral responsibilities for school age children.

  The Named Person will:

  - Advise , inform and support the child or young person, or a parent of the child or young person

    - Help the child or young person, or their parents, to access a service or support
    - Discuss or raise a matter about a child or young person with another service provider
- The Early Years Collaborative sets out to:
    - Create a structure in which Community Planning Partners can easily learn from each other and from recognised experts in areas where they want to make improvements.
    - Support the application of improvement methodology to bridge the gap between what is known to work and what is done.
- Valuing Young People is a guide for professionals working with young people on the key policies and principles to refer to when designing services.
- The Equality Act 2010 provides a legal framework to protect the rights of individuals and advance equality of opportunity for all. There are nine 'protected characteristics' under the Act, one of which is age.
- The Protection of Vulnerable Groups (Scotland) Act 2007 sets out the legislation compelling governments to establish mechanisms to enhance protection of vulnerable people, including older adults and young people, from abuse and neglect.

4.4 Epidemiology

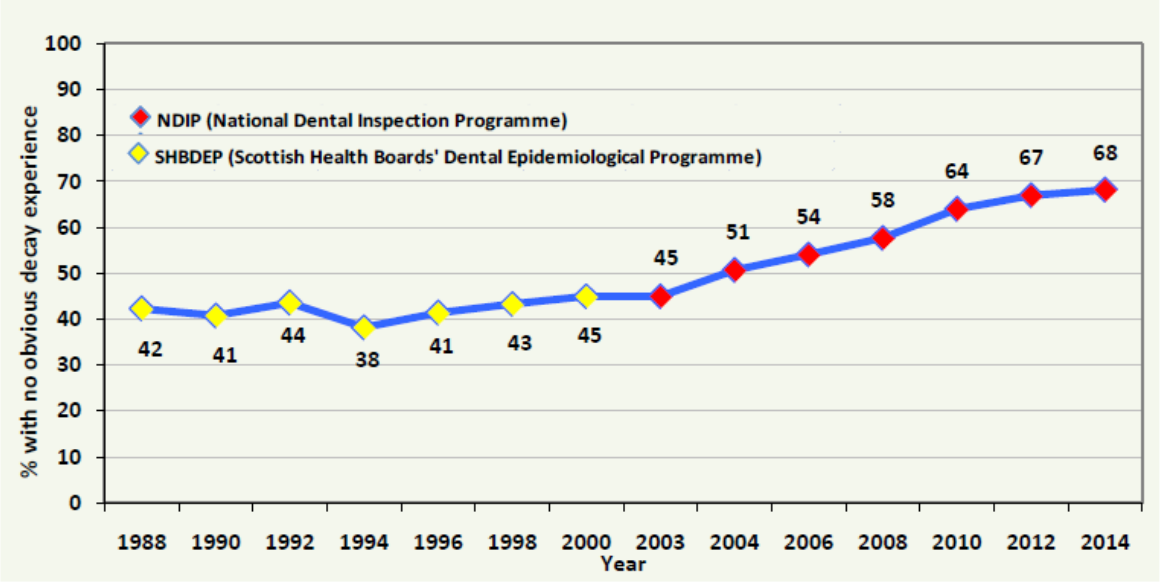
4.4.1 Introduction

The NDIP inspection is carried out annually in each NHS Board across Scotland for P1 and P7 children. In addition to informing parents/carers of the oral health status of their children, it gathers aggregated, anonymised data on children's decay experience which can be used to support planning for policy and service development. Data from NDIP (previously SHBDEP) are comparable year-on-year. Although the NDIP programme is resource-intensive for the PDS to deliver the information yield is of benefit for monitoring oral health improvement and planning of services.

4.4.2 Primary 1 (P1)

Between 1988 and 1996 the proportion of P1 children free from obvious decay was fairly static, followed by a period of slight improvement between 1996 and 2003. However, Figure 2 shows that between 2003 and 2014 the percentage of P1 children with no obvious decay into dentine increased markedly from 45% to 68%.

Figure 2: Trends in the proportion of P1 children with no obvious decay experience, in Scotland; 1988-2014



Sources: ISD NDIP Database, SHBDEP

1. The distance between each point does not represent an equal period of time as the results have not been published consistently over the 26 year period.

Correspondingly, the mean number of decayed, missing and filled ($d_3$mft) teeth in the P1 population has dropped over the same period from 2.76 to 1.27. However, caries is not evenly spread throughout the population. Of the children who have obvious decay into dentine, the average number of teeth affected is 3.97. The majority of this decay is untreated.

The Care Index (ft/$d_3$mft x 100) measures the proportion of decay that has been treated by restoration (fillings or crowns). The most severe decay is normally dealt with by extractions, frequently under general anaesthetic. When this taken into account, the true extent of untreated decay in this age group is 65% (d_3/$d_3$mft x 100).

4.4.3 Primary 7 (P7)

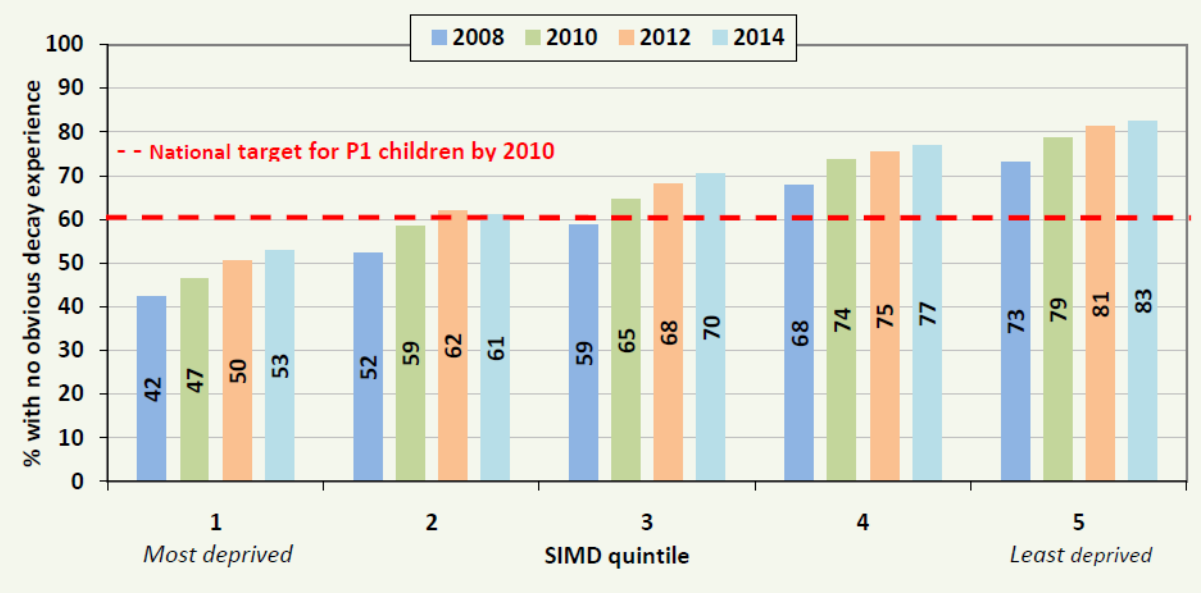
The 2015 NDIP inspection showed that 75% of Scottish P7 children were free from obvious caries into dentine. All NHS Boards met the 2010 target of 60% of P7 children to be free from obvious caries and this has continued to improve over the intervening five years.
The number of teeth affected by decay/caries in the P7 population has more than halved between 2005 and 2015 (D_3MFT reduced, from 1.29 to 0.53). In common with P1 children decay is unevenly distributed but there has been an improvement in D_3MFT for those with decay experience from 2.72 to 2.16. Not only do fewer children in P7 have experience of decay, but each child with decay has a lighter burden than in 2005.

The Care Index has improved from 36.4% in 2005 to 55.0% in 2015. However, it should be noted that after a significant increase between 2005 and 2007, increases since then have been modest. In addition, the data showed that 29.4% of sound permanent molars were fissure sealed in the Scottish P7 population, with NHS Board figures ranging from 18.5% to 57.5%.

4.4.4 Inequality and Patterns of Decay

It is widely recognised that children living in relative material deprivation have consistently higher levels of decay than their more affluent peers. These inequalities can be highlighted by mapping “obvious caries” against deprivation (measured by Scottish Index of Multiple Deprivation SIMD). Using this approach, the 2014 P1 NDIP Report shows that 53% of children in the most deprived group are free from obvious caries compared with 83% in the least deprived (Figure 3).

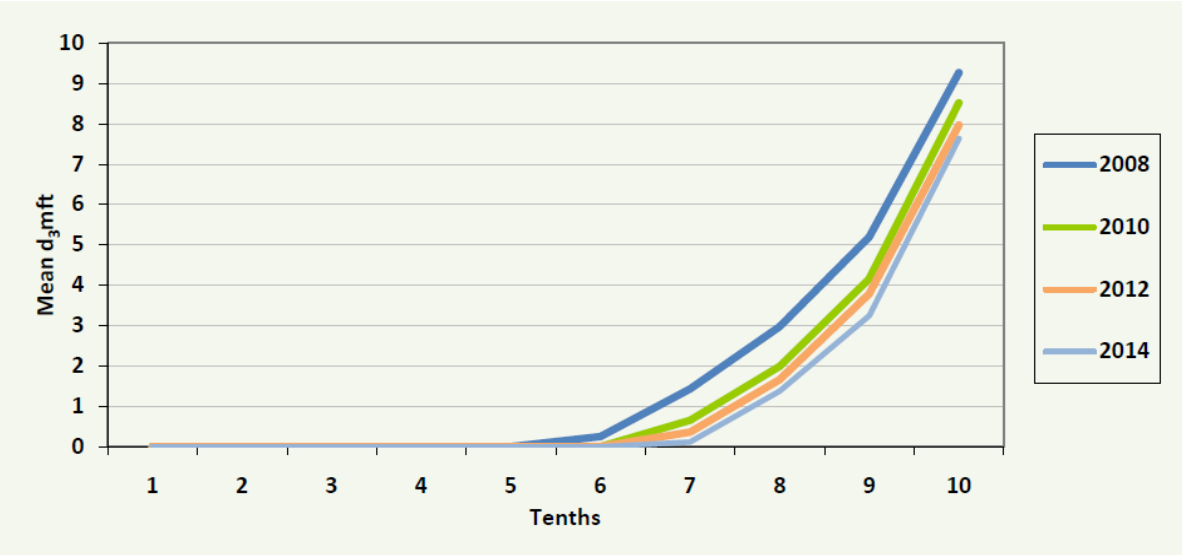
Figure 3: Change between 2008 and 2014 in the proportion of P1 children in Scotland with no obvious decay experience, by SIMD quintile.



Source: ISD NDIP Database

The Scottish Caries Inequality Metric (SCIM10) shows a small and recent reduction in oral health inequality. This is measured using the area under the curve, as can be seen in Figure 4. In this case there is an improvement from 14.49 to 8.57, between 2008 and 2014.

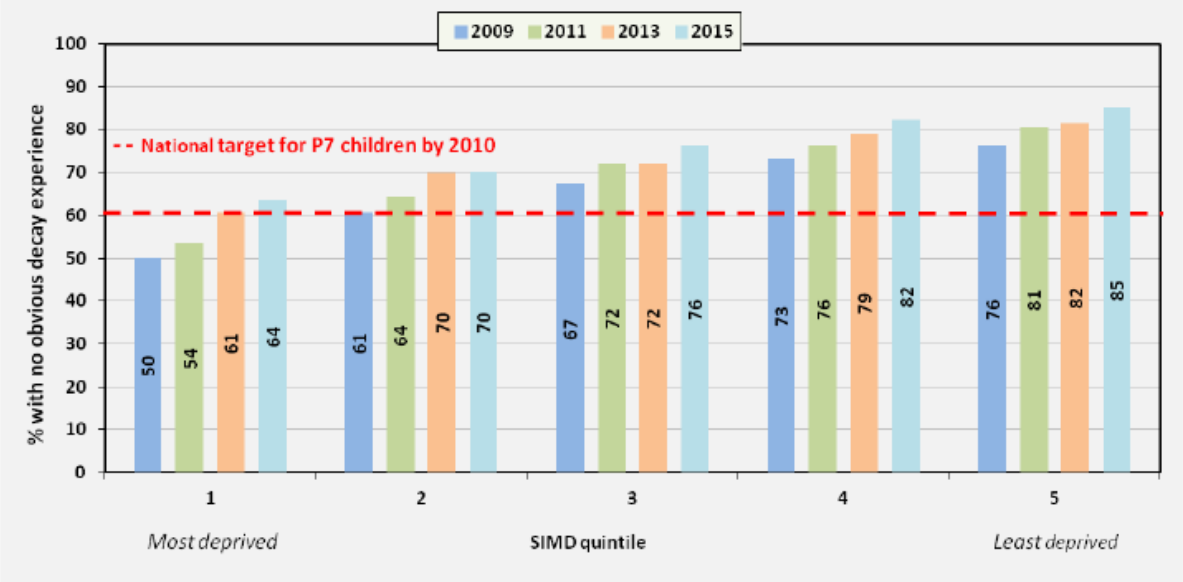
Figure 4: Mean number of decayed, missing and filled primary teeth (d3mft) in each tenth of the distribution of d3mft in P1 children in Scotland; 2008 – 2014.



Source: ISD NDIP Database

The 2015 NDIP P7 report demonstrated that between 2009 and 2015 each deprivation quintile has shown an improvement in the proportion free from obvious caries (see Figure 5).

Figure 5: Change between 2009 and 2015 in the percentage of P7 children in Scotland with no obvious decay experience; by SIMD quintile



Crucially, in the P7 population the major improvement has been observed in the most deprived quintiles, and for the first time all quintiles reached the 2010 national target of 60% with no obvious decay experience.

4.5 Preventive Care

Currently there are no artificial water fluoridation schemes in Scotland. In the absence of such universal measures, all prevention is delivered by dental team members in various care settings. In addition to care in the dental surgery, there is also a national initiative across Scotland for improving oral health.

4.5.1 Childsmile

Childsmile is Scotland's national oral health improvement programme for children, with the following elements.

- Core Programme

Every child is provided with a dental pack containing a toothbrush, fluoride toothpaste and oral health messages, on a least six occasions by the age of five years. Children also receive a free-flow feeder cup by the age of one year. In addition, every 3 and 4 year old child attending nursery, is offered free, daily, supervised toothbrushing. Supervised toothbrushing is also offered to Primary 1 and Primary 2 children in targeted schools.

- Childsmile School and Nursery Programme

Throughout Scotland, children with the highest levels of need are offered biannual fluoride varnish application at primary school and nursery. Fluoride varnish is applied by Childsmile

dental teams which comprise Extended Duties Dental Nurses (EDDN), trained in the application of fluoride varnish, aided by Dental Health Support Workers (DHSW). All children are encouraged to register with a dental practitioner and at each stage, children who require further assessment and possible dental care will be identified and sign-posted to a dentist.

- Childsmile Practice Programme

Childsmile Practice is introduced to families by the Health Visitor, who reinforces key oral health messages, including the benefit of child dental registration by 6 months of age. For the most vulnerable families, a DHSW provides home support, preventive advice and assistance in attending a primary care dentist.

4.6 Demand

The demand for paediatric dental services is expected to increase as the preventive initiatives, such as Childsmile, help people who would not normally access dental health services to attend. This programme is widely recognised as helping to reach children who, in the past, may not have accessed anything other than emergency dental care. It may be, however, that the success of Childsmile is drawing children into dental care pathways who were previously unknown to services. Whilst in the long term this should improve the overall dental health of Scotland's children, the demand on the more specialist dental services to support these children seems to be increasing.

In general, children referred to specialist paediatric dental services belong to following categories.

- Children with extensive decay (NDIP data)
- Children with Support & Care Coordination needs (SNS data)
- Children with high risk medical conditions i.e. oncology, haematology and cardiac (SMR 01 data)

It should be noted that children might have more than one condition at any given time. There are data available for the three categories listed above, so they are explored in more detail below. However, a fourth category might be "children requiring complex treatment" but because there is no routinely collected data this group cannot be quantified.

4.6.1 Children with extensive decay

According to NDIP reports a quarter of P7 and a third of P1 children have some form of decay (National Dental Inspection Programme 2015, 2014). Depending on the severity of the caries, these children can either be routinely treated in primary care, or might be referred either to the local PDS or a Hospital department. There is no information regarding decay for children of preschool and secondary school age.

Children with extensive decay often require hospital admission for extractions under GA. The cost per case for this service was calculated by National Institute for Health and Clinical Excellence (NICE) guideline number 112 in 2010 as £719, with sedation as £213.01 (NICE, 2010). Although, these figures apply to England, the Scottish costs are likely to be similar.

4.6.2 Children with Support & Care Coordination Needs

Support Needs System (SNS): The SNS is a sophisticated clinical tool that provides the facility to record accurate details of the child's problem or condition, including a detailed disabilities / impairments section. According to SNS system 1.41% of child population have some form of disability (Table 3). These children are commonly seen by the PDS or in the Hospital paediatric dental service, if their disability affects their dental treatment.

Table 3: Number of children active on SNS system in Scotland from 2011-2015

	Number of Children Active on SNS	Mid-year Child Population Estimate	% of Child Population on SNS
2011	15,682	1,116,059	1.41
2012	15,967	1,113,114	1.43
2013	16,132	1,110,845	1.45
2014	15,892	1,106,294	1.44
2015	15,563	1,103,149	1.41

Source: Support Needs System, August 2011 - August 2015

However, SNS has not been implemented in all NHS Boards across Scotland and the level of implementation and utilisation of the system varies in those Boards that do use SNS, therefore these figures are an underestimate of the true numbers.

4.6.3 Children with High Risk Medical Condition e.g. Oncology, Haematology and Cardiac

Children with high risk conditions are commonly referred to Hospital paediatric dental services. The number of children diagnosed with high risk conditions is not usually recorded except for oncology. Table 4 shows number of children diagnosed with all cancer types excluding non-melanoma skin cancer (ICD-10 C44).

Table 4: Trends in incidence of oncology in children aged 0-17; 1989-2013

Year	Registrations
2005	153
2006	124
2007	145
2008	160

2009	150
2010	124
2011	145
2012	153
2013	142

Source: ISD

Additional information can be gained by looking at discharge figures (please see Table 5)

Table 5: Discharges (Day case rates per 100,000 population) from acute hospitals by Main Diagnosis; Children aged - 18 and under

	2010/11	2011/12	2012/13	2013/14	2014/15[p]
All Diagnosis A00-T98, Z00-Z99	3,252	3,251	3,273	3,352	3,397
Diseases of the digestive system	906	938	895	906	918
Factors influencing health status and contact with health services (includes admissions for examination, observation, immunisation, stoma care, respite care, disrupted family/home circumstances, awaiting fostering)	391	384	378	362	366
Neoplasms	291	288	317	354	393
Congenital malformations, deformations and chromosomal abnormalities	213	217	215	229	219
Diseases of the genitourinary system (includes urinary tract infection, vescico-ureteral reflux, renal failure, testicular torsion)	188	204	180	196	232
Diseases of the ear and mastoid process (includes otitis media, hearing loss)	174	154	172	160	146
Diseases of the musculoskeletal system and connective tissue (includes juvenile arthritis, osteomyelitis, Perthes disease)	148	162	185	200	223
Diseases of the respiratory system	133	104	130	132	125
Diseases of the skin and subcutaneous tissue (includes skin infections and eczema)	109	91	97	90	86
Diseases of the blood and blood forming organs and certain disorders involving the immune mechanism	103	128	124	131	130
Diseases of the eye and adnexa (includes blindness, glaucoma, strabismus)	94	95	102	106	99
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	86	84	82	93	104
Injury, poisoning and certain other consequences of external causes	79	84	84	74	75
Endocrine, nutritional and metabolic diseases	62	53	48	60	62
Diseases of the nervous system	61	61	68	64	64
Diseases of the circulatory system (includes arrythmias, heart failure, intracerebral haemorrhage)	23	24	32	41	26
Certain conditions originating in the perinatal period	11	11	10	9	7
Certain infectious and parasitic diseases	7	10	11	18	17
Mental and behavioural disorders	4	3	3	4	4
Other	171	156	141	123	101

Source: ISD Scotland, SMR01 p=provisional data

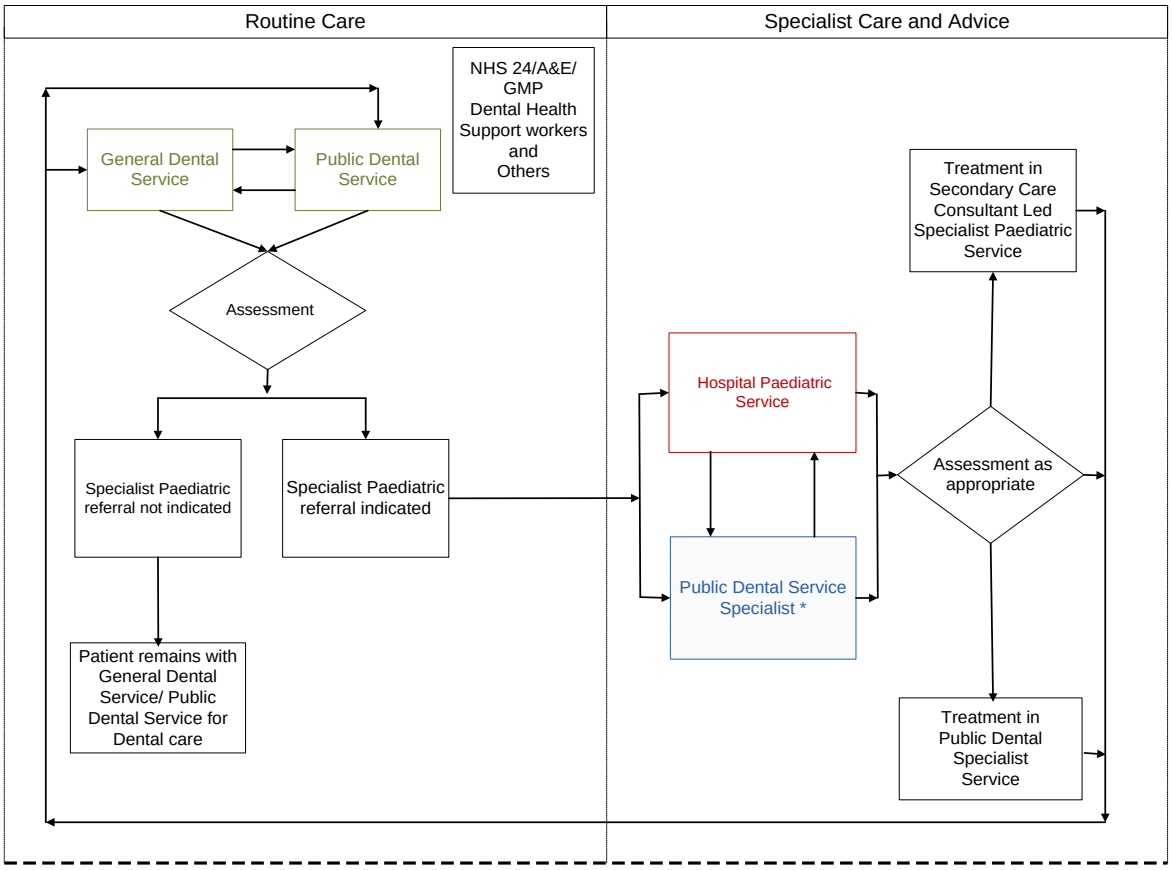
5 Current Service Delivery Model/Patient Journey Pathway

5.1 Paediatric Dentistry

Paediatric Dentistry is unlike any other dental specialty in that it covers all aspects of oral health care for children such as restorative care, including endodontic treatment, and prosthetics, minor oral surgical procedures and interceptive orthodontics.

Children's oral health and dental services are delivered at primary care, secondary care, and tertiary care level based on the complexity of the condition. In general, the services are differentiated into Routine Care and Specialist Care (see Figure 6).

Figure 6: Current Service Delivery Model/Patient Journey



* PDS Specialist service is only available in some NHS Boards

5.2 Routine Care

Routine care is delivered by Primary Care Dental Services in Scotland through

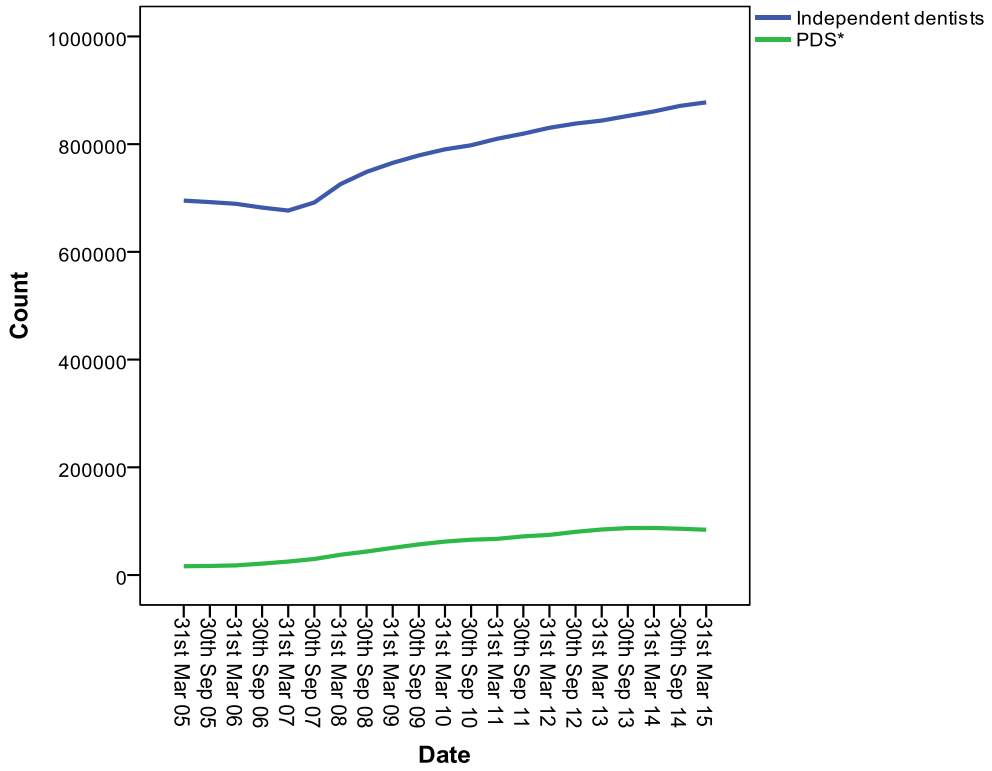
- General Dental Services (GDS): General Dental Practitioners (GDPs) are independent contractors, contracted by the NHS Board to deliver services under the GDS regulations and paid through the GDS funding stream. People register with a dentist in order to receive the full range of NHS treatment available under GDS. GDP-led teams are

expected to provide routine treatments including preventive treatment incorporated by Childsmile.

- The Public Dental Service (PDS): The PDS was recently established, and was previously known as the Community Dental Service or Salaried Dental Service. PDS is made up of teams of salaried dentists and DCPs, directly employed by the NHS Board to deliver services (Scottish Government, 2014c). Currently, in some Boards, the PDS provides routine treatment to child patients where GDP services are limited or non existent. They may also provide treatment in a hospital setting including treatment under general anaesthesia (GA).

Most children are registered in the GDS as shown in Figure 7 below.

Figure 7: Number of children registered with a GDP (independent contractors) and PDS in Scotland



Source: ISD, MIDAS, data extracted in April 2015

Figures for September 2014 and March 2015 are provisional

Figures for March 2014 and September 2014 have been revised

*PDS (salaried GDS (not including CDS) prior to Jan 14 and salaried and CDS for Jan 14 onwards)

5.3 Specialist Care

Specialists in paediatric dentistry provide care for children whose dental care needs cannot be met routinely in primary care.

In summary, there are three broad categories which require specialist input:

- Where the patient has complex needs, even if the dental treatment is simple
- Complex dental treatment
- Multi-disciplinary treatment

Specialist care is largely delivered by specialists and consultants in secondary and tertiary care settings. However, in some health Boards specialist care is also delivered by specialists in the PDS. It is recognised, however**, that the skill set of the individual delivering specialist care is the key factor, rather than the setting in which care is provided.** The volume of specialist care provided in a primary care setting is sometimes limited due to the unavailability of appropriate infrastructure and equipment e.g. GA, sedation facilities or radiographic equipment.

Where there is no availability of specialist care through the PDS, paediatric patients requiring specialist care need to travel to dental hospitals. This inequality of access to specialist paediatric care mostly impacts children living in remote and rural areas.

Tertiary care services are delivered in Scotland through dental hospitals and paediatric hospitals. These are often also training institutions. Tertiary referrals are received from medical consultant colleagues in the children's hospitals and other general hospitals, from dental consultant colleagues and from the PDS.

Secondary and tertiary care services accept referrals for paediatric patients in the following categories (British Society for Paediatric Dentistry, 2009):

1. Severe early childhood caries or unstable/extensive caries in the mixed/permanent dentition
2. Severe tooth tissue loss
3. Abnormalities of tooth morphology, number, and structure;
4. Complex dento-alveolar trauma
5. Periodontal or soft tissue conditions/lesions
6. Disturbances of tooth eruption
7. Advanced restorative/endodontic care including laboratory-made restorations
8. Complex endodontic therapies including management of non- vital immature teeth or teeth undergoing internal or external resorption
9. Direct/indirect composite restorations for teeth with extensive tooth tissue loss or enamel/dentine defects
10. Non-vital or vital bleaching techniques
11. Surgical interventions outwith the competence of the primary care practitioner

12. Interceptive orthodontic treatment
13. Treatment planning for children requiring extractions under general anaesthesia
14. Treatment planning and provision of comprehensive dental care under general anaesthesia
15. Anxiety/phobia
16. Child protection issues
17. Multi-disciplinary care

In addition, the following can be considered as modifying factors to treatment, and can help in explaining the need for more specialised care:

- **Medical e.g. Haematology, Cardiology, Metabolic, Respiratory, Psychiatric**
- **Social e.g. Looked After and Accommodated Children (LAAC)**
- **Behavioural e.g. Dental anxiety, Learning disability, Behavioural disorders, Autistic Spectrum Disorder/ADHD.**

6 Current Service Provision

6.1 GDS Service Provision

The vast majority of dental care for children in Scotland is delivered by General Dental Practitioners (GDPs) and Dental Care Professionals (DCPs) in the General Dental Service (GDS), who treat children under capitation and an item of service (IoS) fee as determined by the Statement of Dental Remuneration (SDR). There are also a number of grants and allowances given to support practice expenses e.g. rent reimbursement, GDPA (general dental practice allowance). It is entirely appropriate that all those children who require routine preventive and restorative care should receive their treatment in this environment, as part of the family's regular dental visits. Care within the GDS should be regarded as the norm.

However, it is recognised that there are a significant number of children whose needs are not entirely met within the GDS. The environment of general practice can be focussed on providing care for adult patients, and few practices can invest in specifically child-friendly facilities. The remuneration available to dental practitioners for undertaking preventive and restorative treatment for children continues to be an area of great contention. Simple procedures can present huge challenges to a practitioner when faced with a young or anxious child, and the time involved in reassuring and persuading young patients to cooperate with treatments is not felt to be recognised within the current fee structure. A small number of general dental practitioners utilise the services of hygienists/therapists to facilitate the treatment of their child patients. This would appear to be a much underutilised resource, and recommendations for change in this regard are made.

In spite of the number of episodes of care undertaken by GDPs, they also make onward referrals for dental treatment. These referrals are made to the Public Dental Service (PDS) or the Hospital Dental Service (HDS), depending on local availability, the local referral protocols and historical referral pathways.

Table 6 shows the number of children registered with General Dental Services. Registration is now life long, so a new measure of "participation" is used to show the number of patients who have attended in the last two years. It was noted by ISD that there was no deprivation gap between registration rates for children (90% for children living in both the most and least deprived areas) but children living in the least deprived areas are more likely to have participated within the last two years than those living in the most deprived areas (91% compared to 82% at 31st March 2015) (Information Services Division, 2015b).

Table 6: Numbers and rates of registered NHS GDS child patients participating in the General Dental Service over a two year period, to end of year

	31st March 2014				31st March 2015			
Age group	Registered patients	Registration Rate (%)	Participation Numbers	Participation Rate (%)	Registered patients	Registration Rate (%)	Participation Numbers	Participation Rate (%)
All Children	**948,214**	**86**	**824,422**	**86.9**	**961,661**	**87.4**	**822,398**	**85.5**
0-2	84,396	47.3	82,832	98.1	84,175	48.4	82,801	98.4
3-5	161,865	92.1	145,568	89.9	163,446	91.3	145,911	89.3
6-12	402,317	105.6	346,098	86	414,816	108.0	351,113	84.6
13-17	299,636	99.0	249,924	83.4	299,224	101.9	242,573	81.1

Source: ISD, MIDAS,

The average cost of dental care treatment per head of child population in Scotland is shown in Table 7. Please note this includes 107,000 courses of orthodontic treatment. The average cost is £66 per year. However, this varies across Scotland ranging from £45 for Western Isles to £81 for Greater Glasgow and Clyde.

Table 7: GDS fees - Total fees, cost per head of population of children 2013/14

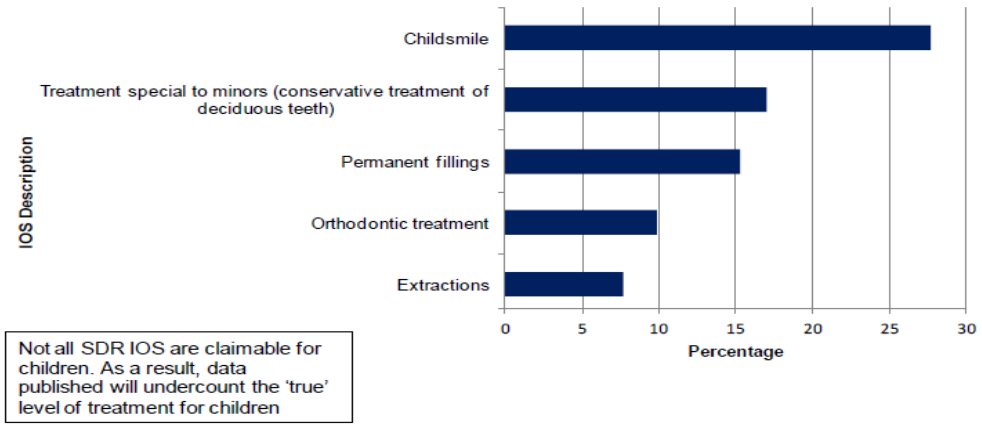
NHS board	Total fees (Capitation + IOS earnings) (£)	Population	Number of registrations	Cost per head of population (£)
Scotland	**68,563,684**	**1,035,394**	**950,256**	**66**
Ayrshire & Arran	4,933,551	72,032	65,894	68
Borders	1,472,539	21,703	18,419	68
Dumfries & Galloway	1,580,675	27,737	25,349	57
Fife	4,369,677	72,853	64,958	60
Forth Valley	3,883,247	60,576	52,880	64
Grampian	6,265,492	110,733	94,063	57
Greater Glasgow & Clyde	17,727,426	217,972	231,556	81
Highland	3,419,217	61,864	55,286	55
Lanarkshire	7,569,633	134,980	107,797	56
Lothian	11,499,731	162,699	149,937	71
Orkney	215,564	4,063	3,817	53
Shetland	233,531	4,940	4,754	47
Tayside	5,160,577	78,106	71,093	66
Western Isles	232,824	5,136	4,453	45

Source ISD

This can be explained by some children who are treated in NHS Greater Glasgow and Clyde live in other NHS Boards (Information Services Division, 2014) and might also be due to the fact that NHS Greater Glasgow and Clyde has the highest percentage of deprived areas compared to other regions of Scotland, as in common with other chronic diseases, dental decay is more prevalent in areas of deprivation.

The five most common types of SDR IoS treatments carried out for children in 2013/14 are shown in Figure 8.

Figure 8: Most common SDR IoS treatment-percentage of all claims; Scotland 2013/14 for children



Source: ISD Scotland, MIDAS
[1] Items of service (i.e. treatments) as stated in the Statement of Dental Remuneration (SDR)
[2] Children are defined as <18 years old
[3] For children, not all SDR IOS are claimable, e.g. examinations can only be claimed for orthodontic purposes or when necessitated by trauma. Therefore comparisons with figures for adults should not be made.
[4] Treatments paid in 2013/14
[5] Dentists need to submit GP17 forms for the Childsmile treatments given but these are paid as part of the Capitation fee rather than having a fee attached to the SDR IOS

Almost one third (28%) of the SDR IoS treatment for children were treatments given under Childsmile. The second most common SDR IoS type was for treatment of primary teeth ("baby teeth"), including fillings and application of fissure sealants (17% of all SDR IoS).

Table 8 shows the number and value of treatments carried out by primary care dental services from 2011 to 2014. Overall, there has been a slight reduction in treatments carried out in primary care; however, there is a slight increase in treatment carried out under sedation.

Table 8: Main SDR item of service treatment claims for Children from 2011/12-2013/14 by GDS

	2011/2012		2012/2013		2013/2014	
Main SDR item of service treatment	**Number**	**£ Value**	**Number**	**£ Value**	**Number**	**£ Value**
Fillings - Items 14, 44(a)(e), 58(b)(c)(d)(e) & 60(a	471,039	5,451,049	457,633	5,260,794	432,355	5,014,938
Root treatments - Items 15, 44(c)(d), 58(f), 60(c)(d) & 63(c)(d)(e)(f)	9,198	380,380	9,054	368,224	8,972	380,576
Veneers - Items 16 & 64	588	63,575	478	51,714	410	44,784
Inlays - Items 17(a)1, 17(f)5,1, 17(j)1,1, 17(k)1 & 51(c)1	43	5,394	27	3,438	19	2,513
Crowns - Items 17, 51(a), 51(b), 51(c)2& 65	1,113	150,546	986	133,694	869	117,884
Bridges - Items 18, 51(d) & 58(g)	259	36,729	215	30,832	129	19,510
Dentures - Items 27, 28, 55(a)(b)(c)(d), 59 & 62	401	37,218	331	29,918	303	27,458
Extractions - Items 21 & 52(a)	97,037	1,094,395	90,509	1,028,601	90,207	996,468
Surgical treatments - Items 22 & 52(b)	1,762	79,624	1,617	74,493	1,318	57,052
Sedations - Items 25, 54 (b) & 54 (c)	2,681	112,793	2,580	106,499	2,960	122,882
Domiciliary visits - Items 35(a) & 57(a)	40	1,541	47	1,875	66	2,465
Recalled attendances - Items 35(b) & 57(b)	306	20,436	298	19,734	246	16,351

Childsmile was introduced into the SDR in October 2011 and all GDP practices delivering NHS care to children are expected to deliver Childsmile interventions. A Childsmile Practice is required to provide preventive dental care and caries management tailored to the individual needs of the child (NHS Health Scotland, 2011).

Interventions must incorporate:

- Dietary advice
- Tooth brushing demonstration for parents and carers
- Fluoride advice

- Clinical prevention, e.g. fissure sealants and fluoride varnish applications as appropriate.

Table 9 shows the number and value of Childsmile services carried out by primary care dental services from 2011 to 2014. It is observed that the number of claims and the value continues to rise as more dental practices participate in delivering Childsmile interventions.

Table 9: Childsmile service claims and value from 2011 to 2014

Year	Number of claims[2]	Value (£)[4]
2011/12	143,383	307,751
2012/13	305,936	556,778
2013/14	352,489	674,713

However, while the figure is rising with only 48% of 0-2 year olds registered, the latest ISD data on dietary advice and toothbrushing suggests only 65% are getting what they should. For 3-5 year olds, this drops to around 40% of registered children receiving the advice and support they should. Only a third of registered 2-5 year olds received one application of fluoride varnish in 2014-15 and only 16.5% received the recommended two applications. There is also significant variation across all these measures between NHS Boards (2015 Childsmile Headline Report).

6.1.1 GDP Survey

Aim

The aim of this survey was to determine the nature and scope of provision of routine care to children by a GDP including provision of interventions incorporated by Childsmile, barriers to providing routine care, and use of PDS clinics and dental hospital services.

Method

In the first instance, a survey was conducted of GDPs who had an active nhs.net email. This included some salaried PDS dentists. Due to the absence of respondents from Lothian, some GDPs working in that area were contacted by alternative email addresses. Two timelines of contact were followed, with non-responders to the first survey re-contacted three weeks later (see Appendix 2 for the Survey Questionnaire).

Results

Out of 1310 GDPs and salaried GDPs invited to participate in the survey, 375 (28.6%) GDPs and salaried GDPs responded to the survey. After excluding responses from salaried GDPs (which were 40), the response rate from the GDPs was just over 26%. However, it is assumed that GDPs who participated in the survey are highly motivated or proactive and therefore it is acknowledged that results might not reflect an average GDP's response.

Table 10 shows GDPs who have responded to the survey and their corresponding NHS Board area

Table 10: GDPs' Health Board

NHS Board	Number of respondents	Percentage of Total response
Not Reported (NR)	3	.9
Ayrshire and Arran	13	3.9
Borders	2	.6
Dumfries and Galloway	12	3.6
Fife	18	5.4
Forth Valley	13	3.9
Grampian	56	16.7
Greater Glasgow and Clyde	85	25.4
Highland	39	11.6
Lanarkshire	55	16.4
Lothian	11	3.3
Orkney	4	1.2
Shetland	4	1.2
Tayside	15	4.5
Western Isles	5	1.5
Total	335	100.0

Preventive Treatments:

The majority of GDPs who participated in the survey indicated that they provided preventive care including the interventions incorporated by Childsmile (please see Table 11). However it is notable that this varies from the national ISD data, confirming that this may not be the representative sample of GDPs but instead reflects a more highly motivated group.

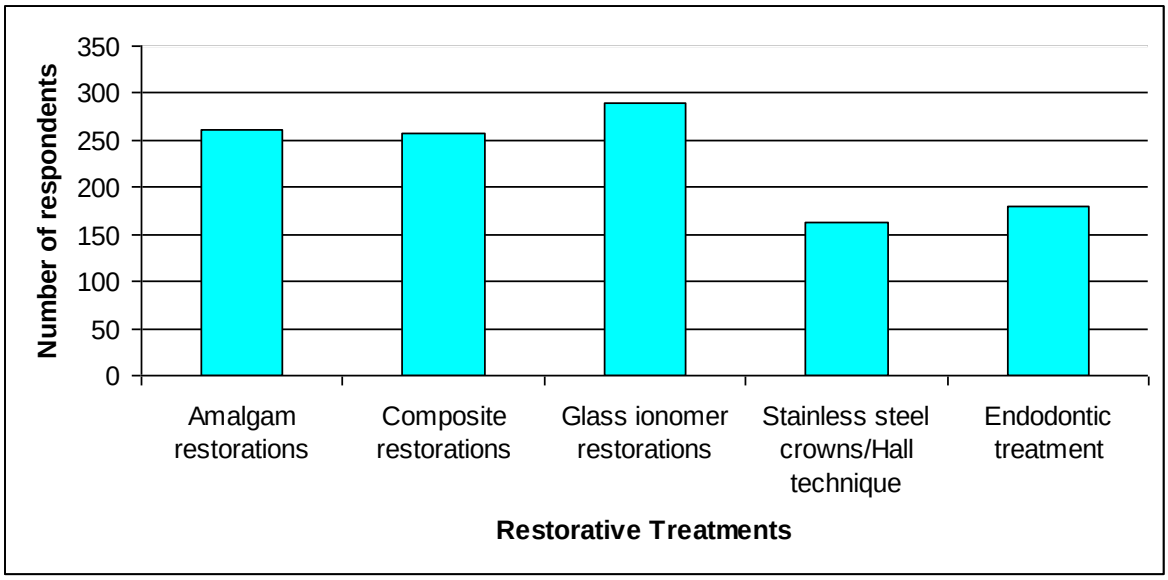
Table 11: Preventive treatments provided by GDPs

Preventive Treatments	Number of respondents providing preventive treatments	Percent
Dietary advice	320	95.5
Tooth-brushing instruction	317	94.6
Fluoride varnish application	299	89.3
Fissure sealants	293	87.5

Restorative Treatments:

Figure 9 shows that the GDPs who participated in the survey routinely undertook restorative treatments. Glass ionomer restorations are the most common and "stainless steel crowns" (Hall technique) are the least common restorative treatments undertaken. Preformed metal crowns (PMCs) are colloquially known as "stainless steel crowns". Some GDPs reported that parents do not like stainless steel crowns.

Figure 9: Restorative treatments provided by GDPs



"Parents are reluctant to accept appearance of stainless steel crowns. Caries continues to heavily affect a small number of children."

"Parents can occasionally be a challenge for the placement of stainless steel crowns as they dislike the appearance."

"Parents don't like the SSCs even though often only option left."

Challenges/Barriers to providing treatments to child patients:

GDPs indicated that patient cooperation was the main challenge they encountered with their child patients. Many (65%) GDPs indicated that patient cooperation is a barrier for multiple extractions followed by endodontic treatments, restorations and stainless steel crowns respectively. GDPs also indicated that the SDR fee was a barrier to these treatments (please see Table 12).

Table 12: Challenges to providing the following treatments for child patients

Treatment	SDR fee		Time		Training		Staffing		Patient cooperation	
	%	Count	%	Count	%	Count	%	Count	%	Count
Preventive advice	44.8	150	40.0	134	8.4	28	10.1	34	22.4	75
Fluoride varnish	34.6	116	21.2	71	4.5	15	7.5	25	39.4	132
Fissure sealants	33.1	111	22.7	76	2.1	7	5.1	17	48.1	161
Restorations	38.8	130	24.8	83	3.6	12	3.0	10	54.6	183
Stainless steel	28.4	95	28.1	94	23.3	78	4.8	16	49.6	166
Endodontic treatment	46.9	157	34.6	116	14.9	50	5.1	17	60.3	202
Multiple extractions	42.7	143	30.7	103	5.1	17	6	20	65.7	220

Some GDPs believed that they were not remunerated appropriately for time spent on provision of dental services to child patients. GDPs felt that SDR fees would be adequate if the child patients were able to cooperate.

"Dental services for children have always been under funded and always will be. They are more time consuming and more difficult to treat but dentists are paid less than the adult fees".

"Fee provided by the SDR is adequate if child patient is co-operative but not if more time is taken."

"Restoration fees for a child are ridiculous. A 7-12 year old child takes much more time to carry out a routine restoration. An occlusal amalgam fee for what can be easily half an hour's work is laughable, for the practice it does not even pay the nurse, let alone materials".

"Treating children can be extremely challenging and stressful. It is an added insult when the fee does not cover the cost of the time involved. Effectively we do not get paid for doing some of these treatments."

Referral to Public Dental Service

Over half (59%) of GDPs who participated in the survey indicated that they are aware of the treatment offered by the PDS but 22.4% indicated that they are not aware. More than two thirds (68%) of GDPs also indicated that they have referred child patients to their local PDS. Some GDPs reported that communication between PDS and GDS was poor and others believed that they did not have a local paediatric PDS service.

"We have only a vague idea of where to refer to and what treatment is provided."

"No Service Locally".

"Not sure who to refer to".

"Referral pathway is difficult, very little information".

Over half (58.8%) of GDPs indicated that they find it straightforward to refer to the PDS and 39.1% indicated that they are aware of local referral protocols for PDS.

The most common reason for referral to the PDS was poor cooperation (56.4%), followed by GA (54%), anxiety (53.7%), sedation (51.6%) and special needs (47.8%). Please see Table 13 for details of reasons for referral to PDS. A number of referrals cited more than one condition, and therefore the percentages shown in the Table 13 add up to more than 100%.

Table 13: Reasons for referral to PDS

Referral category	Frequency	Percent
Poor cooperation	189	56.4
General Anaesthesia	181	54.0
Anxiety	180	53.7
Sedation	173	51.6
Special needs	160	47.8
Degree of medical complexity	102	30.4
High caries rate / multiple carious teeth	101	30.1
Degree of dental complexity	59	17.6
Surgical care	52	15.5
Trauma	35	10.4
Vulnerable/looked after and accommodated children	35	10.4

Referral to Dental Hospitals

Over two thirds (67.8%) of GDPs indicated that they have referred child patients to the dental hospital/institutes, while 14% indicated that they have not. Nearly half (47%) of GDPs indicated that severity of condition is the main reason for referral to hospital (see Table 14).

"Our PDS has no specialist Paediatric dentists."

"If GA required then must refer to hospital, our PDS will not accept referral."

"Provision of GA, I do not think our PDS offers this".

"Unaware of other local options".

Table 14: Factors influence GDPs' decision to refer to a hospital rather than PDS

Factors	Frequency	Percent
Severity of condition	158	47.2
Preference	55	16.4
Hospital proforma dictates referrals accepted	61	18.2

Some GDPs listed absence of PDS service due to geography, lack of specialists in the PDS and unavailability of GA in the PDS as other reasons for referral to hospital instead of the PDS. Almost half (43.6%) of GDPs indicated that they are aware of referral protocols for children being referred to one of the dental hospitals while 30.4% indicated that they are not.

The most common reason for referral was GA (44%), followed by dental complexity (36%) then poor cooperation (32%). Please see Table 15 for details of reasons for referral to dental hospital.

Table 15: Reasons for referrals to Dental Hospital

Referral category	Frequency	Percent
General Anaesthesia	150	44.8
Degree of dental complexity	122	36.4
Poor cooperation	106	31.6
Trauma	98	29.3
Degree of medical complexity	91	27.2
Anxiety	91	27.2
Sedation	85	25.4
Special needs	76	22.7
High caries rate / multiple carious teeth	74	22.1
Surgical care	72	21.5
Vulnerable/looked after and accommodated children	14	4.2

6.1.2 Dental Care Professionals (DCPs)

Dental Care Professionals (DCPs) are an expanding group of professionals who are integral to the care and treatment of both child and adult patients. In addition to the dentist, there are six groups of DCPs each with a specific remit in relation to patient care (see Figure 10). The emergence of a number of these professionals arose as a result of the findings on the Nuffield Inquiry of 1993 entitled ‘Education and Training of Personnel Auxiliary to Dentistry’. This visionary document encouraged flexibility in the delivery of dental care, suggesting that oral health needs of the population could be met by a variety of professionals each possessing specific skills.

Figure 10: The Dental Team

Dental Hygiene and Therapy Education

In Scotland, three year Ordinary degrees in Oral Health Sciences are available in the University of Dundee, Glasgow Caledonian University and the University of the Highlands & Islands while a four year Honours degree is offered by the University of Edinburgh. There is a combined intake of 49 undergraduates in each academic year.

The following is a summary of the clinical remit of dental hygienists, dental hygienist-therapists and dental therapists who may be involved in the treatment of children in all branches of the dental services.

Dental Hygienists

Dental hygienists are trained and educated specifically in periodontal and preventive therapy. In addition to screening for oral disease, they are able to undertake all aspects of non-surgical periodontal treatment and preventive care for both the child and adult population. They are qualified to diagnose and treatment plan within their scope of practice and are able to see patients directly without the need for a referral from a dentist.

Dental Hygienist-Therapists

In addition to undertaking the skills of a dental hygienist, dually qualified individuals can also provide all direct restorations in the primary and secondary dentition (adult teeth), and may extract primary teeth. They are also permitted to diagnose and treatment plan within their

scope of practice and work under direct access arrangements with the public. The complete remit of all DCPs can be found on the GDC website at: www.gdc-uk.org/scopeofpractice

Table 16: DCP Workforce

As of August 2015, the following DCPs based in Scotland were registered with the GDC. A number of individuals are registered in more than one category.

Dental Nurses	5678
Dental Technicians	510
Dental Hygienists	412
Dental Hygienist-Therapists	195
Dental Therapists (singly qualified)	16
Orthodontic Therapists	44
Clinical Dental Technicians	13

Survey of Dental Hygienists and Therapists

A survey of dental hygienists and therapists was carried out to explore the clinical treatment of children by dental hygienists and therapists in the General Dental Service (GDS) in Scotland. A total of 214 of 451 completed the questionnaire, representing a 47% response rate (see Appendix 3 for details of the survey). It was apparent from the survey that the majority of dental hygienists and therapists provided treatment for children, but the range of procedures undertaken was restricted. Some of the reasons for this limited clinical practice are indicated in the sample of comments made by respondents (see Appendix 3 for details of the survey). It is clear from the survey data that hygienists and hygienist-therapists are underutilised in the provision of primary care dentistry for paediatric patients in the GDS. However, further analysis will hopefully identify more fully the reasons why these highly-skilled professionals with extensive clinical and academic training are not fulfilling their full clinical potential.

6.2 PDS Service provision

The PDS remit was defined by Scottish Government in 2014

It provides a wide range of services in a variety of settings, including community, custodial and secondary care settings. With specific reference to children the following were highlighted including special needs, learning disabilities, physical disabilities, medically compromised, LAAC, migrants, severe anxiety, and phobia (Scottish Government, 2014c).

6.2.1 PDS Service Provision for Children

The level of oral health/dental service provision to children by the PDS in Scotland was unclear at the outset of the needs assessment. Therefore, a survey of Clinical Directors of the PDS, and in some cases face to face interviews, were carried out to determine the level of PDS service provision within each NHS Board (see Appendix 4 for the Survey Questionnaire).

All NHS Boards within Scotland provide paediatric dental services through the PDS and children are often referred to specific PDS clinics (please see Table 17), However, the scope of the service provided is variable across Scotland and is dependent on the availability of skill mix and infrastructure (e.g. availability of specialists, facilities to carry out GA).

Table 17: Number of PDS Clinics by Health Board

Health Board	Are Children referred to specific clinic/s locations?	If yes, please specify	If so, how many specific clinic locations?
Lothian	Yes	Edinburgh central. East, and Mid Lothian one area; West Lothian as separate area	10
Greater Glasgow and Clyde	Yes	Determined by specific user need and location	17
Shetland	Yes	To any of the PDS clinics	6
Grampian	Yes	Referrals are made centrally then assigned to individual clinics	10
Forth Valley	Yes		6
Borders	Yes	for assessment pre-sedation or GA	6
Ayrshire and Arran	Yes	GA & anxiety management	5
Orkney	Yes	One clinician fronts the Childsmile Practice	2
Highland	Yes	Depends what they are referred for	at least 14 sites have inhalation sedation services
Tayside	No	No, because all clinics across Tayside accept referrals	
Lanarkshire	Yes	Children with special care needs for dental treatment are referred to the nearest community clinic	10
Western Isles	Yes		1
Fife	Yes	a central hub then dependant on needs moved to closest possible clinic with skilled clinician[8 clinics]	8
Dumfries and Galloway	Yes	Secondary dental care clinics in two main bases	2

Patients are referred to PDS clinics by a range of professionals e.g. GDPs, General Medical Practitioners (GMPs), Hospital consultants and Childsmile Dental Health Support Workers. The referral rate is variable across Scotland (Table 18) and this is dependent on various factors e.g. GDPs' awareness of PDS services (please see GDP survey section for details), accessibility and availability of PDS clinics, infrastructure and availability of skill mix. The PDS is often the main provider of dental care in the Island Boards i.e. Shetland, Orkney and Western Isles, due to limited provision of GDS. In some Boards the PDS has staff specifically responsible for the treatment of children.

Table 18: Number of referrals to PDS for provision of paediatric dental service by Health board

Health Board	Approximately how many paediatric referrals do you receive in a month?	Approximately what percent of referrals do you receive for children compared to all referrals?
Lothian	150-200	55% - 60%
Greater Glasgow and Clyde	600	60-65%
Shetland		
Grampian	125	30%
Forth Valley	50-100	20% - 25%
Borders	0-50	
Ayrshire and Arran	100-150	25% - 30%
Orkney	0-50	1% - 5%
Highland	0-50	45% - 50%
Tayside	50-100	20% - 25%
Lanarkshire	50-100	20% - 25%
Western Isles	0-50	5% - 10%
Fife	50-100	25% - 30%
Dumfries and Galloway	0-50	45% - 50%

Provision of dental treatments under GA:

Extractions under GA is offered in all the NHS Boards and referral rates are variable across Scotland (please Table 19). As an alternative to GA i.e. inhalation sedation (IHS) is also offered in all Boards but intravenous (IV) sedation is offered in some Boards (please see Appendix 5)

Table 19: Referral rate for GA provision

Health Board	Approximately how many GA referrals do you receive in a month?	If more than 50, please specify	Do you have post GA Follow up e.g. prevention clinics?
Lothian	45-50		Yes
Greater Glasgow and Clyde		416	No
Shetland	0-5		Yes
Grampian	125 referrals are then pre assessed depending on treatment need and anxiety		no
Forth Valley	35-40		No
Borders	15-20	this is variable and are generally referred for GA or anxiety management	Yes
Ayrshire and Arran		70-80 per month	Yes
Orkney	0-5		Yes
Highland	10-15		No
Tayside	35-40		Yes
Lanarkshire		about 100 per month	No
Western Isles	0-5		Yes
Fife		50-70	No
Dumfries and Galloway	05-10		No

GA lists for dental extractions are available in all Boards. The vast majority of these lists are provided by the PDS (See Appendix 5 for comprehensive care and Appendix 6 for extraction only). However, child patients are not always admitted under the PDS. In some Health Boards, they may be admitted under maxillofacial surgery, so this might cause problems in recording PDS activity. Most NHS Boards also provide comprehensive care including restorative care under GA (please see Appendix 6).

Treatment provision for children who require multidisciplinary care:

Generally, multidisciplinary care is provided to child patients through dental hospitals and other specialist hospitals e.g. Royal Hospital for Children. However, in some NHS Boards multidisciplinary care is also provided through the PDS to a certain extent, and in other Boards, through the Hospital Paediatric dental service (see Appendix 8).

In NHS Boards without a dental hospital/Children's Hospital, "out of NHS Board" referrals for children requiring multidisciplinary care are occasionally made (see Appendix 9).

Workforce in the PDS for provision of paediatric dental services

Table 20 below shows the composition of staff providing paediatric dental services in the PDS. Some Boards have staff specifically for children, while the PDS staff in other NHS Boards provide dental treatment for adults and children. The majority of the staff working in the PDS are dentists with an interest in treating children and some have obtained additional postgraduate qualifications. Specialists in Paediatric Dentistry are employed in Lothian, Greater Glasgow & Clyde and Fife NHS Boards. The presence of specialists in the PDS allows the provision of specialist care for their child patients in community settings. However, in some NHS Boards Specialists in paediatric dentistry have been recruited at SDO level rather than specialist level.

Table 20: PDS Workforce Details by Health Board

Health Board	Does your Service have staff specifically responsible for the treatment of children?	Clinical Director (WTE)	Assistant Clinical Director (WTE)	Specialist in Paediatric Dentistry (WTE)	SDO/Senior salaried GDP (WTE)	CDO/Salaried GDP (WTE)	Therapist (WTE)	Hygienist (WTE)	Specialist in Paediatric Dentistry (Head Count)	Additional Postgraduate qualification but not on specialist list (Head Count)	With an interest in Paediatric Dentistry (Head Count)
Lothian	Yes			2.2		4			3	1	10
Greater Glasgow and Clyde	Yes			0.92	4.4	13.5	2.5	2	1(2*)	16	26
Shetland	No										1
Grampian	yes				0.4					1	
Forth Valley	Yes				1				1		
Borders	No										20
Ayrshire and Arran	Yes				1.3	1	1	1			3
Orkney	No										
Highland	No								2		2
Tayside	No								1		6
Lanarkshire	No										10
Western Isles	No									1	
Fife	Yes			1		8	2	1	2	3	5
Dumfries and Galloway	Yes				1	1					1

* 2 staff with specialist qualifications but not employed as specialist, Numbers were accurate as on March 2016

6.2.2 PDS Retrospective Referral Audit

A retrospective PDS referral audit was undertaken across Scotland for a month to investigate the nature of referrals made to the PDS. The data included the reason (condition) given for the referral, age, and SIMD of patients being referred (see Appendix 10 for Referral Audit Form).

The PDS in Borders, Fife, Forth Valley, Highland, Tayside and one Specialist clinic from NHS Greater Glasgow & Clyde participated in the four week audit. Three of the six NHS Boards who took part in the audit do not employ a dentist at specialist level. The referral rate is very varied and ranges from 15 for Borders to 115 for Fife, due to the variation in population, service provision and staff available in the Boards (see Table 21).

Table 21: Referrals received during 4 week audit and availability of a specialist

PDS clinic	Total number of referrals received during four week audit	Availability of a Specialist
Borders	15	No
Fife	115	Yes
Forth Valley	66	No*
Highland	53	No
Greater Glasgow and Clyde Specialist Clinic (RAH)	33	Yes
Tayside	69	Yes
Total	**351**	

* SDO is on the specialist list but is not employed as a specialist.

Reason for Referral of Children to the PDS

The most common reason for referral of children to the PDS is for management of anxiety (61.5%) and phobia followed by treatment planning for children requiring extraction under GA/Sedation (52.7%) and severe childhood caries (42.2%), as shown in the Table 22.

Table 22: Reason for referral of children in descending order

	Reason	Number of referrals received	Percentage
1	Anxiety/Phobia	216	61.5
2	Treatment planning for children requiring extractions under general anaesthesia/sedation	185	52.7
3	Severe early childhood caries or unstable/extensive caries in the mixed/permanent dentition	148	42.2
4	Others including medical conditions	45	12.8
5	Abnormalities of tooth morphology, number, and structure	32	9.1
6	Surgical interventions out with the competence of the primary practitioner	13	3.7
7	Treatment planning and provision of comprehensive dental care under general anaesthesia	8	2.3
8	Advanced restorative/endodontic care including laboratory-made restorations	7	2
9	Interceptive orthodontic treatment	6	1.7
10	Periodontal or soft tissue conditions/lesions	5	1.4
11	Disturbances of tooth eruption	4	1.1
12	Direct/indirect composite restorations for teeth with extensive tooth tissue loss or enamel/dentine defects	3	0.9
13	Complex dento-alveolar trauma	3	0.9
14	Child protection issues	2	0.6
15	Complex endodontic therapies including management of non- vital immature teeth or teeth undergoing internal or external resorption	1	0.3
16	Severe tooth tissue loss	1	0.3
17	Reason not specified	1	0.3
18	Non-vital or vital bleaching techniques	0	0
19	Multi-disciplinary care	0	0

Many other reasons were given for referral. Almost half of these were related to a disability or medical condition (see Appendix 11). However, there were regional differences (see Appendices 12, 13,14) for example the PDS in Fife, Tayside and Highland received over 60% of referrals for anxiety and phobia, whereas the specialist clinic in GG&C and the PDS in Borders received over 60% of referrals for severe caries.

Relationship between most prevalent condition and SIMD

In common with other chronic diseases, this audit has confirmed that referrals received for anxiety/phobia, extraction under GA/Sedation and dental decay were more prevalent in areas of deprivation (See Appendix 15).

Relationship between number of referrals, Health Board, and SIMD

Table 23 shows the relationship between referral rate and SIMD. Paediatric patients seen in the PDS come from all SIMD quintiles, with more referrals overall from the most deprived areas. There were regional differences, e.g. majority of child patients referred to Highland and Borders PDS came from affluent SIMD 4 area, whereas child patients referred to Fife, Forth Valley and GG&C came from the most deprived areas. In Tayside, there was no gap between the least and most deprived areas.

Table 23: PDS Clinic and SIMD 2012 quintile Cross tabulation

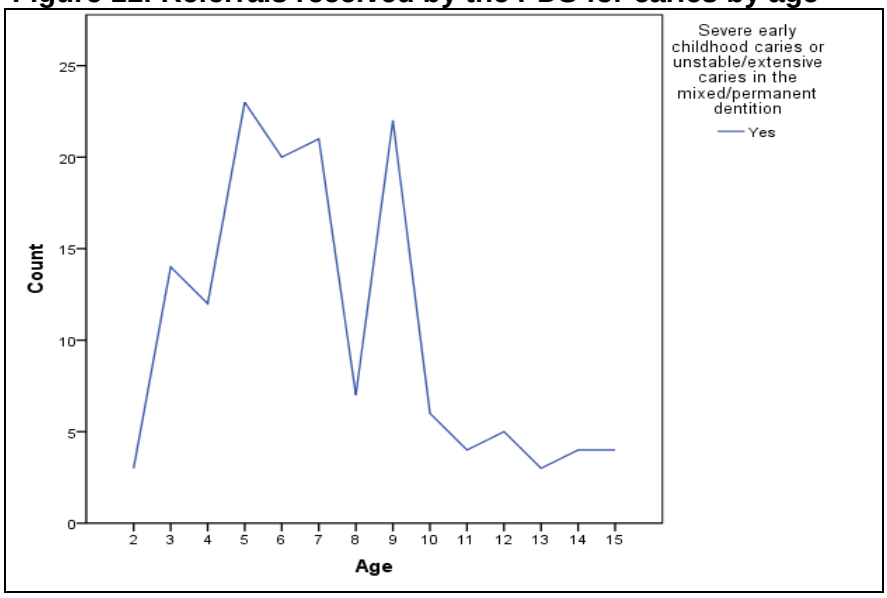
Health Board	SIMD 2012 quintile					
	1	2	3	4	5	Total
Borders	0	4	4	5	0	13
Fife	32	28	28	13	9	110
Forth Valley	22	16	11	9	4	62
Highland	6	13	12	17	2	50
Greater Glasgow and Clyde (GG&C) Specialist Clinic (RAH)	11	7	4	4	6	32
Tayside	18	12	11	18	2	61
Total	89	80	70	66	23	328
Percentage	27.2%	24.4%	21.4%	20%	7%	100%

Note: Postcode could not be matched/not reported for 23 referrals

Relationship between age and caries

According to Figure 11, the age of children referred to the PDS for management of dental caries in this audit ranged from age 2 to 15 years old. It was noted however that referral rates were greater for those aged between 3 and 10 years old. This might be because referrals prior to the age of 3 are less common as the decay may not have yet developed or may be more difficult to identify the decay or that only a limited examination has been possible and therefore more difficult to clinically assess. Referrals after the age of 10 appear to diminish and this may be because most of the primary teeth will be close to exfoliation and/or be at a stage where symptoms or complications are less frequent. Additionally, those with caries in the permanent teeth are at an age where they are more likely to be able to manage treatment within the routine GDS dental setting.

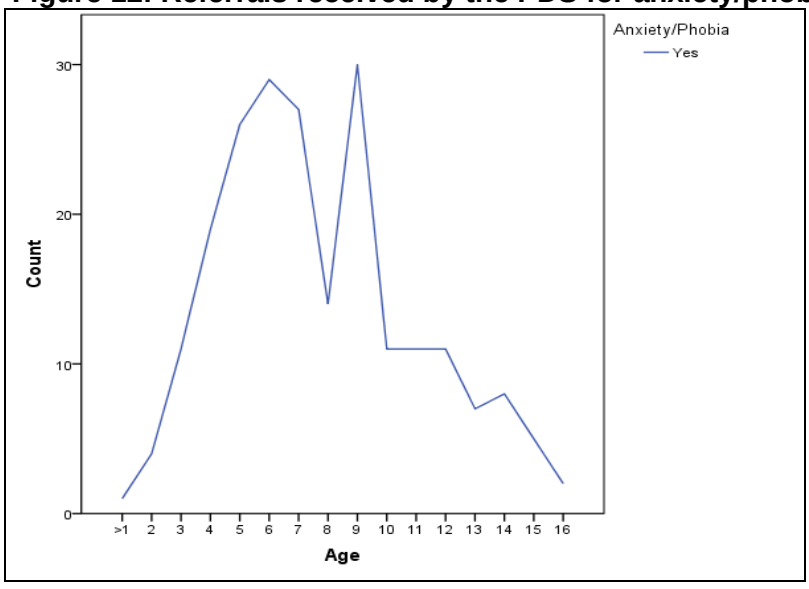
Figure 11: Referrals received by the PDS for caries by age



Relationship between age and anxiety/phobia

Anxiety is the most common reason for referral to the PDS. According to Figure 12, the age range of children referred to the PDS for anxiety/phobia was from younger than a year old to 16 years. However, most common age of referral was 6 and 9 years. It is acknowledged that anxiety may be related to other underlying social reasons, not necessarily dental ones. There are some children who may not present elsewhere, but they will attend the dentist, so it is important that dental professionals using the GIRFEC approach are mindful of other potential underlying reasons.

Figure 12: Referrals received by the PDS for anxiety/phobia by age



Referral triage result/Outcome

In general, children referred to the PDS are seen by a specialist (where available) or dentist for an assessment. Very few children are sent back to GDS or on to the Hospital Service (see Appendix 16).

6.3 Hospital Paediatric Dentistry Service Provision

The Hospital Dental services are delivered in four main locations in Scotland. Dundee (DDH), Edinburgh (EDI) and Glasgow (GDH) have consultant-led hospital dental services, and staff also provide services within the local acute Children's Hospitals. Aberdeen Dental Hospital (ADH) had a consultant service until 2014.

The remit of a Hospital Paediatric Dental Department includes the following:

- Provide paediatric dental advice for referring practitioners from the GDS and the PDS.
- Provide specialist paediatric dental services for children who require specialist treatment.
- Provide a tertiary paediatric dental service for medically compromised children.
- Provide access to specialist advice through managed clinical networks.
- Teach and train dental and DCP undergraduate students, training grade hospital staff, postgraduate specialists and dental practitioners.

Currently a large percentage of referrals made to the Hospital Dental Service are for the management of dental caries in children who are anxious and/or find co-operating with dental treatment a challenge. These children require time to become acclimatised to treatment, and therefore a structured introduction to dental care is required. Preventive measures such as fluoride varnish and fissure sealant of appropriate teeth should be undertaken in the primary care setting for all children at risk of caries, in accordance with Scottish Intercollegiate Guidelines Network (SIGN) guidelines (Scottish Intercollegiate Guidelines Network 138, 2014). Behaviour management techniques and inhalation sedation are useful adjuncts, and these are available within the Public Dental Service. Where caries management and anxiety are the main reasons for GDP referral, these should go to dental therapist/hygienist colleagues or the Public Dental Service in the first instance.

The main role of a hospital paediatric dentistry department is to ensure that children who require multidisciplinary care, particularly children with medical co-morbidities or requiring input from other dental specialities, receive the level of dental care they require through shared care pathways.
In Scotland, paediatric dentistry consultants work only in hospital settings but there is a different model in England, with some consultants working in community settings.

6.3.1 Hospital Activity

Data for total and new patient attendances over a five-year period were obtained from three out of the four Scottish Dental Hospitals and are detailed in Tables 24 and 25. While there are small fluctuations from year-to-year, there were no significant changes to the patient flow in Glasgow and Dundee. In Edinburgh, between 2010-2014 there was a 25% range in total patient attendances which was felt to reflect a variation in capacity arising from staffing fluctuations.

Table 24: Total Paediatric Dentistry Patient Attendances

Dental Hospital	2010	2011	2012	2013	2014
Glasgow Dental Hospital (GDH)	10,323	10,333	10,195	9,972	10,173
Edinburgh Dental Institute (EDI)	5,692	5,332	4,251	4,499	4,816
Dundee Dental Hospital (DDH)	4,497	5,078	4,989	4,826	4,626

Source: Paediatric Dental Hospital Departments

Table 25: New Paediatric Dentistry Patient Attendances

Dental Hospital	2010	2011	2012	2013	2014
Glasgow Dental Hospital (GDH)	3,267	3,549	3,494	3,437	3,277
Edinburgh Dental Institute (EDI)	1935	2240	1869	2054	2252
Dundee Dental Hospital (DDH)	887	933	762	755	765

Source: Paediatric Dental Hospital Departments

6.3.2 Hospital Retrospective Referral Audit

Retrospective referral audits were undertaken in GDH, EDI and DDH for a month to investigate the nature of referrals made to hospital-based Paediatric Dental Departments. The data included the reason (condition) given for the referral, age and SIMD of patients being referred (see Appendix 17 for the Hospital Referral Audit Form). A number of referrals cited more than one condition, and therefore the percentages shown in the Table 26 add up to more than 100%.

Table 26: Number of referrals received across the three centres over a month by condition

Condition	Number of referrals received n (%)			
	Total	**GDH**	**EDI**	**DDH**
Total number of referrals	**887**	**440**	**315**	**132**
Severe early childhood caries/extensive caries in mixed/permanent dentition	**499**	262 (59.5)	175 (55.6)	62 (47.0)
Other (including medical conditions)	**233**	101 (23.0)	79 (25.1)	53 (40.2)
Treatment planning for extractions under GA	**211**	172 (39.1)	16 (5.1)	23 (17.4)
Anxiety/Phobia	**198**	63 (14.3)	98 (31.1)	37 (28.0)
Abnormalities of tooth morphology, number and structure	**122**	42 (9.5)	55 (17.5)	25 (18.9)
Periodontal or soft tissue conditions	**42**	16 (3.6)	16 (5.1)	10 (7.6)
Complex dento-alveolar trauma	**38**	21 (4.8)	7 (22)	10 (7.6)
Treatment planning and provision of comprehensive dental care under GA	**24**	65 (14.8)	24 (7.6)	0 (0.0)
Surgical interventions outwith the competence of the primary practitioner	**24**	13 (3.0)	9 (2.9)	2 (1.5)
Multidisciplinary care	**19**	19 (4.3)	0 (0.0)	0 (0.0)
Complex endodontic therapies	**17**	13 (3.0)	2 (22.0)	2 (1.5)
Disturbances of tooth eruption	**12**	3 (0.7)	3 (1.0)	6 (4.5)
Advanced restorative/endodontic care including laboratory-made restorations	**11**	4 (0.9)	5 (1.6)	2 (1.5)
Interceptive orthodontic treatment	**8**	4 (0.9)	2 (2.2)	2 (2.3)
Child protection issues	**8**	3 (0.7)	3 (1.0)	2 (2.3)
Direct/indirect composite restorations	**5**	2 (0.5)	2 (6.0)	1 (0.8)
Severe tooth loss	**4**	2 (0.5)	1 (3.0)	1 (0.8)
Non-vital or vital bleaching	**3**	2 (0.5)	1 (3.0)	0 (0.0)

Referral rate

Child patients were referred to hospital departments by GDPs, GMPs, Medical Consultants, PDS staff, and 'others'. Almost 900 children were referred to the Hospital Services in the one-month period (Table 26). In all three centres, the commonest reason for referral of the child patient was for the management of severe caries (59.5%, 55.6% and 47% in Glasgow, Edinburgh and Dundee respectively).

The second most commonly referred patient group across the three centres as a whole were patients with medical conditions who were at high risk, either from dental disease or from the treatment to manage oral disease e.g. oncological, cardiac, haematological conditions.

The third most commonly referred patient group across the three centres as a whole were patient requiring treatment planning for extractions under GA. The cost per case for this service was calculated by NICE in 2010 as £719, with sedation as £213.01 (see Table 27 and 28 for details of cost). Of interest, when compared to the PDS data (see PDS provision section for details) it was noted that patients requiring comprehensive dental treatment under GA was a frequent reason for referral to hospital services. This difference perhaps reflects the limited capacity for provision of comprehensive care within the PDS. However, in common with the PDS data, anxiety/phobia was also a frequently cited reason for referring a child to the hospital-based departments. While it is recognised that there will also be a need for these departments to manage caries, it would be appropriate to review the pathways for these children to ensure that, where appropriate local services exist within the PDS, their treatment needs are met as close to home as possible.

Table 27: Number of referrals received across the three centres over a month for extraction only GA

Condition	**Number of referrals received n (%)**			
	Total	**GDH**	**EDI**	**DDH**
Treatment planning for extractions under GA	**211**	172 (39.1)	16 (5.1)	23 (17.4)

Table 28: Cost of extractions only GA in the Hospital setting as calculated by NICE (NICE 2010)

Time Period	**Cost of dental GA**	**Cost of sedation**
1 month/ 4 weeks	Number of referrals received 211 211 x £719.90 = £151,898.90	Number of referrals received 211 211 x £273.01 = £57,605.11
1 year/ 12 months	Number of referrals received 211 211 x 12 = 2321 2321 x £719.90 = £1,670,887.90	Number of referrals received 211 211 x 12 = 2321 2321 x £273 = £633,656.21

Relation between Referral Rate, Health Board, and SIMD

In general, the three Dental Hospitals serve their own population but accept a small number of patients from other NHS Board areas (see Appendices 18, 19 and 20). There are a number of out-of-Board referrals, particularly to GDH (28% are out-of-Board referrals), which indicates there may be an unmet need where there is no availability of local specialists.

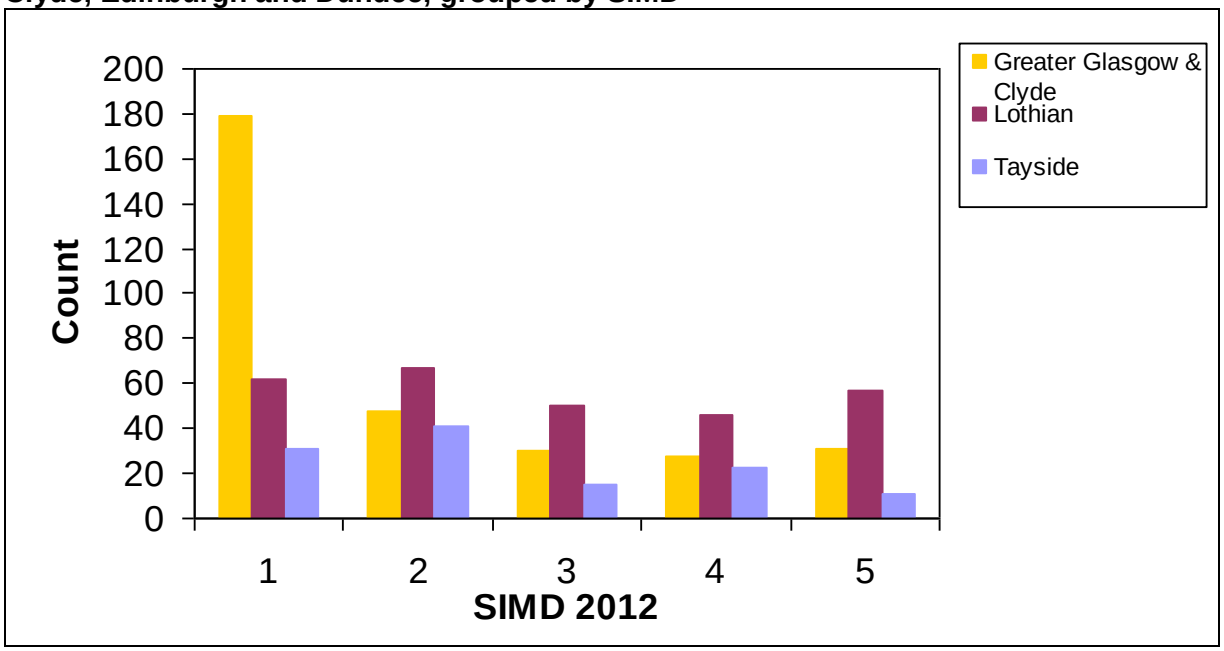
The referral rate within the Board areas of dental hospital ranges from 15 in Glasgow to 17 in Edinburgh per 10,000 population as shown in Table 29 below.

Table 29: Referrals Received by GDH, EDI and DDH from within the Board area

	Number of Referrals Received within the Board Area n (%)	Rate per 10,000 population
Greater Glasgow & Clyde (GDH)	316 (72%)	15
Lothian (EDI)	282(90%)	17
Tayside(DDH)	121(92%)	16

Figure 13 below demonstrates the relationship between referral rate, NHS Boards and SIMD for Glasgow, Edinburgh and Dundee respectively.

Figure 13: Referrals received within the NHS Board areas of Greater Glasgow and Clyde, Edinburgh and Dundee, grouped by SIMD



While the three hospitals received referrals across all five SIMD quintiles, more than half of the children referred to Glasgow Dental Hospital from within the NHS Board area were from the most deprived SIMD quintile. This was not unexpected given the profile of communities within the different NHS Board areas.

"Out of NHS Board" referrals were made to dental hospitals mainly for treatment of caries, treatment planning for extractions under GA, trauma and multidisciplinary care.

Relationship between referral rate of condition with SIMD

Figures 14, 15, and 16 compare the referral rate of the top five treatment conditions that were referred to dental hospitals with the patient SIMD. It is observed, as expected, that the

top five treatment conditions referred to GDH were all corresponded to the SIMD profile for deprived areas. This relationship was not as strong for EDI and DDH except for caries referrals. This may relate to the fact that that the majority of patients referred to Glasgow Dental Hospital come from the most deprived quintile. It is also confirms the fact that caries is most prevalent in deprived areas.

Figure 14: GDH referrals for top five conditions with SIMD quintile

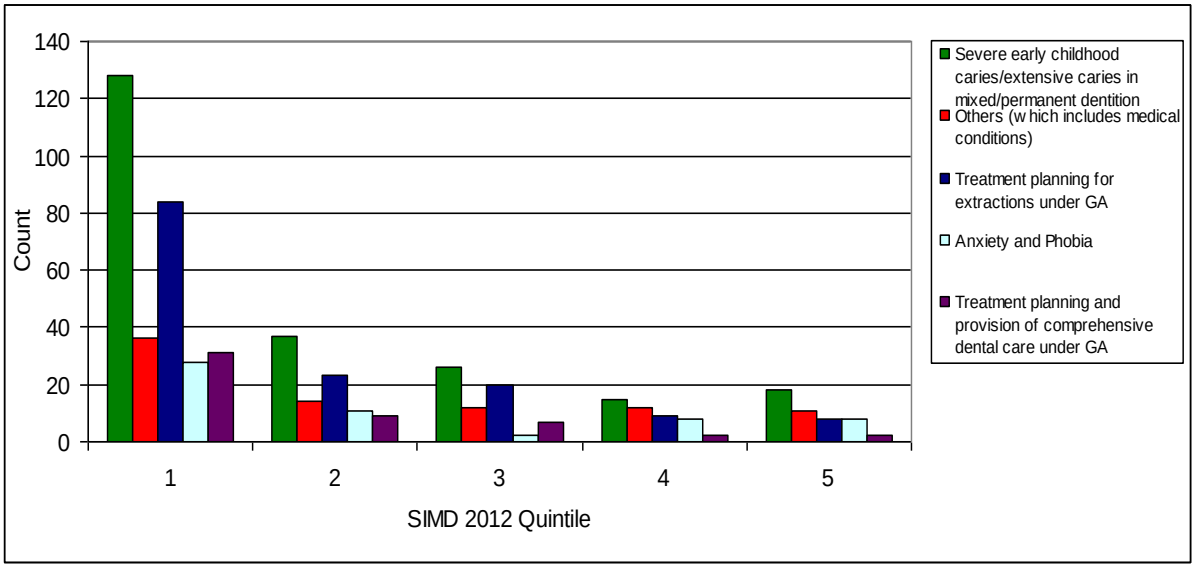


Figure 15: EDI referrals for top five conditions with SIMD quintile

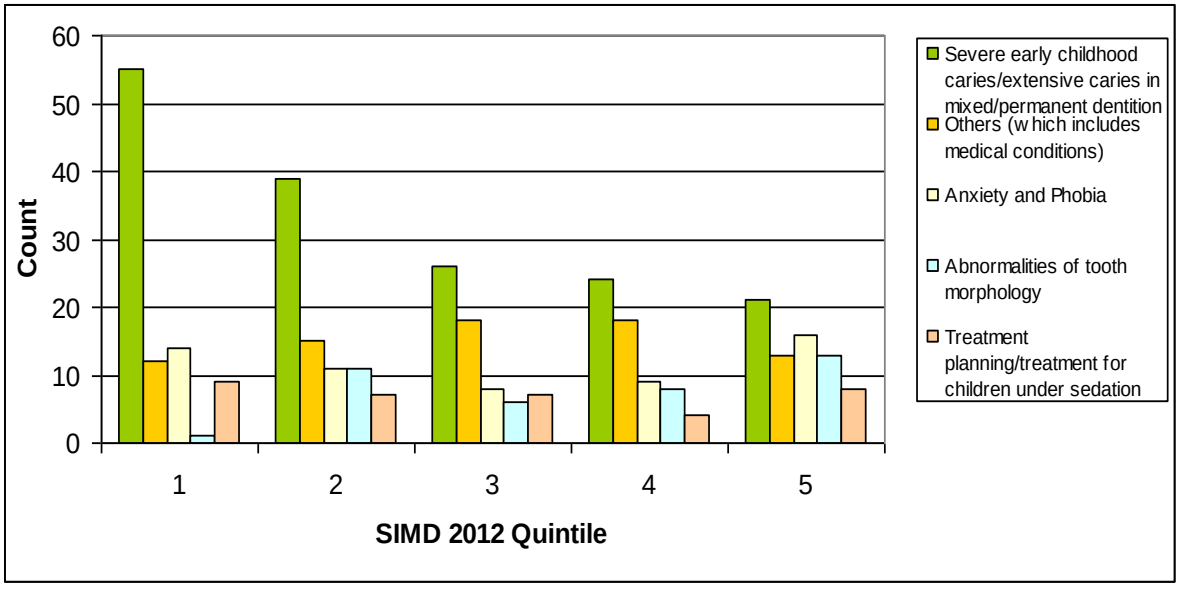
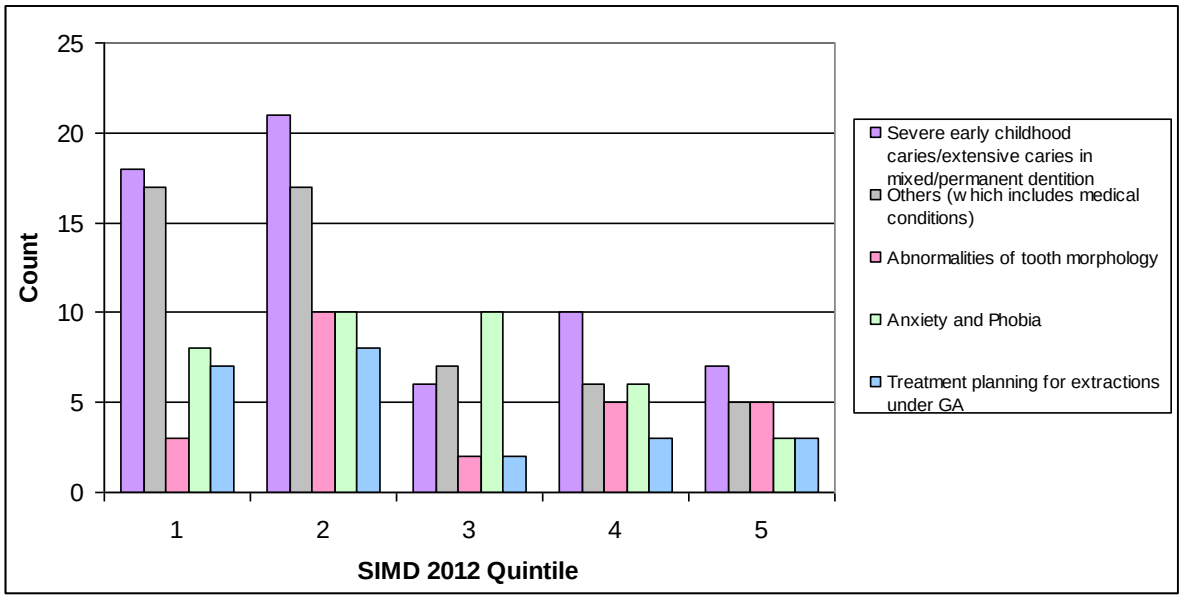


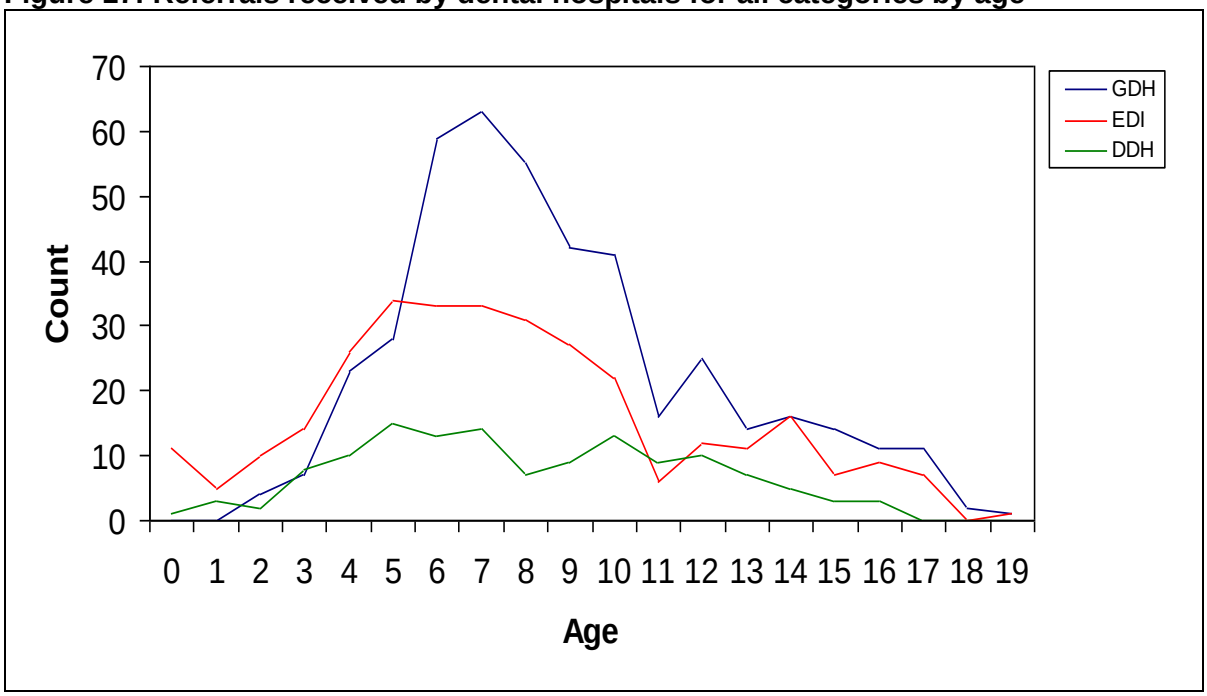
Figure 16: DDH referrals for top five conditions with SIMD quintile DDH



Relation between referral rate and age

Figure 17 shows the number of patients referred to paediatric dental departments by age. According to the figure, most referrals are made for age group 5 for EDI (10.8%) and DDH (11.4%), whereas age is slightly higher for GDH at 7 years (14.3%). This may be because child patients from deprived areas of Glasgow might not be accessing dental care at an earlier age.

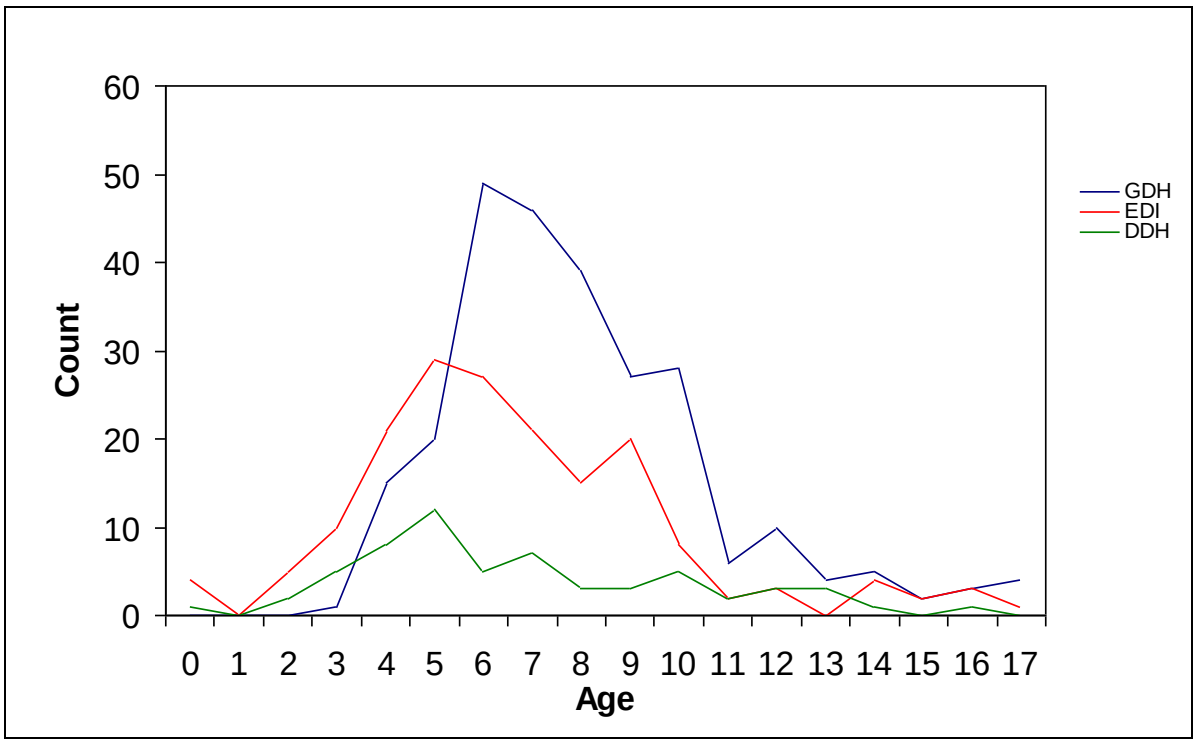
Figure 17: Referrals received by dental hospitals for all categories by age



Relation between referral rate and age, and caries

As shown in Figure 18, the most frequently referred age group for severe caries to EDI and DDH was 5. but was 6 to GDH. Again, this might be due to delayed access to dental health services. There is also possibility that, because of complex social factors, these children may be absent from school when NDIP inspections are undertaken, and therefore are not referred on to a dentist via that route.

Figure 18: Referrals received by GDH, EDI and DDH for caries by age



Consultation Outcome

In general, children referred to paediatric dental departments are seen by a consultant for an initial assessment. Very few children are immediately sent back to the GDS or on to the PDS without first receiving treatment.

6.3.3 Current Hospital Workforce

The current workforce in paediatric dentistry department includes

- NHS Consultants
- Academic Consultants/Teaching Consultants
- Specialty Registrars (StRs) and Post-CCST Development Posts
- Staff Grades/ Speciality Dentists or Associate Specialists
- Pre-specialist trainees
- Dental Hygienists and Therapists

The current workforce in hospital paediatric dentistry who have direct patient care responsibilities are listed in the Table 30.

Table 30: Current Hospital Workforce

	NHS Consultants		Academic Consultants		Specialty Registrar (StR)		Senior House Officer (SHO)		Staff Grade		Specialist		Therapists	
	WTE	Head Count	WTE	Head Count	WTE	Head Count	WTE	Head Count	WTE	Head Count	WTE	Head Count	WTE	Head Count
Glasgow Dental Hospital	2.4	3	1.1	2	1.8	2	4	4	0	0	0	0	0	0
Edinburgh Dental Institute	2.9	*4	1.6	2	3	3	1	1	0	0	2	2	0	0
Dundee Dental Hospital	*2	*2	1.1	4	0.6	1	1.2	2	0.9	3				

*including vacancy (As on January 2016)

6.3.4 Consultants

The total WTE for Specialist's and NHS Consultants in paediatric dentistry in Scotland is 9.3, although this figure excludes academic consultants. As with the PDS, the numbers of staff within the HDS are small, and the utilisation of this resource should be carefully scrutinised and monitored.

6.3.5 Consultant Job Plan

One whole time equivalent (WTE) NHS paediatric dentistry consultant post on the new contract consists of 10 sessions per week, of which originally 2.5 sessions were allocated for supporting professional activities (SPA) which includes continuing professional development (CPD), teaching and training, non clinical administration etc. The remaining 7.5 hours were allocated for direct clinical care (DCC) which includes new patient clinics, theatre, sedation, treatment, joint clinics and clinical administration. The consultant contract has now been updated from 7.5:2.5 to 9:1 (DCC: SPA).

7 Patient Perceptions

7.1 Public Dental Service Paediatric Patient Interviews

Structured interviews were conducted to investigate the perceptions of a representative sample of patients/parents attending PDS specialist paediatric dentistry clinics. A patient questionnaire was used to ensure relevant areas were covered (see Appendix 21). Interviews were conducted between December 2014 and August 2015.

Patients' profile

A total of 22 patients from four specialist paediatric PDS clinics participated in the interviews. The patients age ranged from 0-16 and patients were accompanied by a parent/carer.

Patients interviewed were referred to the specialist clinics for variety of reasons, including trauma, extraction, autism, complex learning difficulties, hypodontia, anxiety, phobia, hypomineralisation of enamel, root canal treatment, tongue tie, restorations, fissure sealants, and other medical conditions e.g. oncology.

Participants reported that they were referred by a GDP, dental consultant, medical consultant or midwife. Additionally a self referral was made in some cases where the child had special needs and the parent/carer was proactive in directly contacting the service within their locality. Patients interviewed preferred to be seen locally rather than travelling to a dental hospital. Patients reported that some GDPs appeared to be unaware of the local PDS specialist service.

"The dentist referred us through to the dental hospital ……. I found out about it myself through a friend whose son was attending here, and I managed to get an appointment by speaking directly to the dentist".

"And then we saw a different dentist who said, "No, I want you to go up to the hospital and get this seen". But I work with one of the service managers for the dental school who knew local specialist, and I wasn't sure who to contact, so she had referred me on".

"And if local dentists were aware that this service was here and we didn't have to wait for an appointment in dental hospital, because that would have been a big ordeal to go through to a hospital in the city".

Waiting time and Duration of treatment

It was perceived from the interviews that the patients were seen quickly in the PDS specialist service and the average waiting time for an appointment was 4 weeks. Some patients who were initially referred to a dental hospital reported that they had waited longer, as they have been referred on from the hospital service to the PDS.

"It was maybe about a month or so".

"I think it was about two or three weeks".

"It took quite a while because we first went to the dental hospital in Glasgow, and they referred us here because it was more convenient for us because we stay in Erskine".

Information, communication, and awareness of risks

In general, patients reported that they were well informed about the treatment options and treatment procedures. It was perceived from the interviews that patients were aware of the risks of treatment options and felt that they have made an informed decision.

"Yeah, they explained it as well. They need to give him gas and air as well so they explained all that, they explained everything to him. They've been really good with him".

"If it had to go any further then obviously he would need anaesthetic and stuff, they explained the risks of that. But I think what they've done will hopefully do the job".

"The risks, I think it was just with getting put to sleep. Obviously the risks that always come with that. But when I weighed up the pain that he'd been in with the teeth there was no questions asked, they have to get it done".

"Oh yeah. I just knew that local anaesthetic and sedation wouldn't - it just wouldn't have been an option, and they were going to try... As in all cases, because don't want a child to have a general anaesthetic... I mean, I've seen children and that experience wasn't nice for any of us, but after xx had been in the room just a few minutes, he kind of accepted that "No, a local's not going to work here, it needs to be..." And because he needed quite a little bit of work doing and they wanted to have a look at a few more things than what they might have, they said, "No, general would be..."

Quality of service and support

The specialist care for children in the PDS was highly valued and was considered an essential service by the participants interviewed. They understood that the service delivered was at specialist level and appreciated the fact that they could access the service locally. Patients valued the consistency of seeing the same specialist and reported that the staff were very approachable, friendly, considerate and helpful. Patients valued the time taken by the specialist to see them and did not feel rushed. Parents praised the skills of the specialist in calming the children and felt that they were well supported.

"I think it's an extremely important service because if it wasn't for the likes of this service my son, and especially my daughter here, wouldn't have anywhere to attend regularly. Because she needs that continuity, the same people that she sees on a regular basis. And dentists in practice, don't have the time to do that with her. And this specialist centre is really good for the likes of them. And it's well worth it".

"I just felt from the moment we came in that day, he was only five years old when he had to get the teeth taken out, he was very nervous, I was really nervous, so was his dad. The staff in here seemed to calm me down because I was upset, they seemed to calm him down, make him feel at ease before going under. And as soon as he woke up the aftercare was also brilliant. I felt they couldn't have done any better".

"The staff are very, very friendly, very welcoming. They're happy to deal with the kids, fantastic with kids. And couldn't ask for better".

"No, I'm happy with everything. And everyone's approachable and friendly, knows that there are other issues and take that into account. You don't feel rushed, you don't feel... Because -------'s big problem is waiting, and he just doesn't. If his appointment is at a certain time then the staff appreciate... They can't always obviously accommodate him, but they know that that's just the way he is, and nobody has ever complained."

Some patients preferred the PDS specialist service to the hospital service and reported that the hospital service is good but busy and they had to wait longer to be seen.

"Hospital service is good but always busy and you have to wait. Sometimes you have to wait half an hour to an hour. While here the service you have to wait five minutes or ten minutes or something. Here it's a better service".

"Xx hospital is a great service but you wait always. I mean, a half an hour minimum because of the queues, and

then the dental appointment, you never know what dentist is expected for your kid. It's hospital in general. The hospital unit is overcrowded".

Benefits anticipated

It was perceived from the interviews that some patients treated in the PDS paediatric dental clinics had long term medical conditions and additional needs therefore were accessing the service for continuing care. In general patients were anticipating functional and dental health benefits.

"It's more preventative, I think, rather than anything. So this is the first thing that would stop anything.

I feel clean. It feels clean".

"I know her mouth was quite sore to begin with, and certainly chewing and things is obviously much easier now that she has front teeth as opposed to just broken stumps. So I think the benefit is partly cosmetic, partly practical. As I say, there was a slight element of pain, but pain wasn't the one that was the major one for her".

"Pain relief was my main concern because he's had a lot of trouble".

"Really just to save the back two teeth. Or even keep them until they do need to come out".

"Just for the fact that it can also help him with his vocabulary later on in his life, great pronunciation".

"Just that he's going to be getting a close eye kept on him. So that they can deal with any problems as they arise, and if anything should need to be done, then I know it can be done here, and not in my local dentists. It can be done under GA if necessary. You know that we've other needs as well, but that's taken into account".

7.2 Dental Hospital Paediatric Patient Interviews

Structured face to face interviews were conducted to investigate the perceptions of a representative sample of patients attending the Hospital Paediatric Dentistry Departments. A questionnaire was used to ensure relevant areas were covered (see Appendix 22). Interviews were conducted between 5 June and 25 September 2015.

Patients' profile

In total, 43 patients from three dental hospitals participated in the interviews. Patients' age ranged from 0-16 and most patients were accompanied by a parent.

Patients interviewed on the day were referred to the hospital for a variety of reasons, including trauma, extraction under GA, autism, complex learning difficulties, hypodontia, anxiety, phobia and medical conditions. Patients interviewed reported that they were referred by either a GDP or medical consultant.

Waiting time and duration of treatment

It was perceived from the interviews that across, the three hospitals, patients were not waiting long to be seen by a consultant. However, it was noted that the average waiting time for a consultant appointment was between 2-8 months, although, trauma and emergency patients were seen immediately.

"It wasn't a long wait".

"It was weeks, not too long. I wouldn't say more than six weeks".

"I would say about ten weeks, maybe".

Some parents reported that, although their children were in pain, they were not prioritised. In general, parents reported that they did not mind waiting if the child was not in pain.

"We waited six or seven months, it's been quite a wait. I phoned and they couldn't get her anything sooner. So she's been in constant pain for the last two weeks".

"If it wasn't urgent then I wouldn't have bothered, we can be patient. But just because there was a bit of pain involved".

In some hospitals, patients reported that they experienced delays due to communication/administration problems.

"We got a phone call to come up on the Monday, but then we got a letter to say to come up the following Tuesday. There was a bit of communication breakdown, really".

"It was a mix-up with the records, and the appointment came out with one of my other kids' names and date of birth on it. And when I phoned up, while I was on the phone I was actually given a rearranged appointment for last week. And when I phoned them to confirm the time I was told "no, you've not been given an appointment." And it was put off until this week. Not great up until now".

"But it was a bit mixed up the way letters and things came through. So we haven't actually met the consultant yet".

"I think… well, the dentist said that she sent the referrals, and the hospital said she didn't. So I think both of them, there's a breakdown of communications with both of them".

Some patients reported that they had a very difficult time as a result of staff losing their clinical records.

"It was quite difficult. We did have problems, he had one initial visit, and then they lost his records".

"It's just the general beginning, getting her referred. By the time you wait for an appointment, and then the loss of case notes, and then I got referred to five different departments. But eventually I got it sorted out".

Duration of treatment

It was perceived from the interviews that the majority of patients were seen in the hospital over a long time period, however, this might be due to long term medical conditions.

"About eight years, because he's sixteen now, yeah".

"We have been in the hospital service since he was three months".

"I've been in the dental hospital since I was quite young, maybe six. I am turning fourteen in July.

"It must be five years".

Awareness of risks

In some dental hospitals, it was perceived from the interviews that patients were not aware of the risks of GA. Some parents of child patients who have undergone GA reported that they have not been made aware of any risks.

"No. Really more the paperwork, information. You know, saying like an anaesthetic. You know yourself. I honestly can't remember somebody saying anything…".

"I: You had two GA's and nobody explained any risks?

R: Nope".

"I: they give you a leaflet or something about GA?

R: Nothing. Nothing."

"Well, no risks. That's me kind of coming and going. Because they don't explain the risks to you.

"I think they should be able to explain things a wee bit more to you regarding general anaesthetic, and even give you a leaflet on it explaining the dos and don'ts. Other than that, the service is excellent".

For many of the patients referred for GA with pain and sepsis who are dentally anxious, there is no other realistic option other than GA. Therefore, the risk benefit ratio is very different from most other areas of dentistry.

Information and communication

In general, patients felt they were well informed. Patients reported that the treatment options and treatment procedures were explained to them. It was perceived that patients felt involved when they were given information about their treatment.

"Yeah. They explained everything quite clear".

"Xx has to be put under general anaesthetic, so it's the day ward. So from start to finish everything's explained and again they try to accommodate him because of his needs, and the whole staff were all very understanding".

"Up to now he has explained everything well".

"Yes, because we had a couple of options so they explained it".

"They're giving us choices and we've been going through. We've been quite conservative to start with because we don't really want to go offering veneers but we didn't want to go down that route until she's a little bit older, or see how the other treatments would work better".

"Yeah, they told you both ways, whether he wanted to be awake for the procedure or not. And he made the decision himself. So they gave us all the options, yeah".

However, some patients reported that they had to wait longer for treatment on the day of appointment than originally scheduled. It was perceived that patients were not informed of any delays.

"What I'm not happy with is first time we came we waited an hour from when we arrived. Our appointment was at eleven, got in twelve. The second time we came we waited for fifty minutes. Which I understand it's a trauma clinic, but nobody came out to tell us what was going on".

"The quality is good. My only gripe is that our appointment is ten past nine and it's now quarter to ten. And quite often they're late. Especially considering you're the first in the morning. But other than that it's been good".

"They've been really good and really helpful but sometimes we have to wait a bit longer".

"Some people have maybe not been as good at managing to communicate with you as others".

Quality of service and support

In general, the hospital paediatric dental service was highly rated by the patients interviewed. Patients praised the staff and consultants for the quality of treatment the department was providing. Patients felt that consultants and staff were very considerate and helpful. Parents appreciated that the consultants knew how to treat anxious children and children with additional needs. Parents reported that the consultants made them and their children feel relaxed and supported.

"They absolutely do everything they possibly can to make it not traumatic. Because, the parent is sometimes more traumatised than the child".

"They make me feel quite comfortable and supported and everything. Especially, for my mum, because she was quite worried at the time".

"I can't fault it. It's been really, really good. And it's good to know that the dentist actually has an insight into autistic children. They know how to interact with your child and know how to talk to them appropriately. A lot of professionals who know nothing about autism, particularly if your child is non-verbal, treat them like they're retarded, and he's not, he's clever. He's just starting to speak now, but it's good to have a dentist that understands".

"Ten. I'll give ten, because I have a good experience here. I've been here, like now he's nearly nine years old, so we've been here nine years to this hospital".

However, patients in some hospitals complained about the poor service. It was reported that the patients were not seeing the same consultant and therefore there was no consistency. It

was also reported that the patient appointments were changed at a short notice and a different consultant was allocated.

Yes, they've rebuilt her tooth. But it fell out a few times since. It's been rebuilt three times. So the last time we were here, the dentist we'd seen said that she'd put on the notes that if it did fall out again, that the cover needed to be changed and it to be lengthened. It has been quite traumatic for her, but it's just, I think, one of those things. She's a bit self-conscious. She was crying a few weeks ago because it wasn't the right colour".

"If everybody's familiar and everybody's in place then it's a breeze, it's ten out of ten. But it just takes for maybe one thing to go wrong and then it can become maybe a six or a seven. But certainly the whole familiarity thing is very, very important to children".

"R: No, we constantly see different people.

I: Different people?

R: I would like consistency. But his treatment is going to take… he's fourteen now, we're talking about maybe another six years".

"They keep on changing what consultant he's under, without consulting me. And it just changes everything because I don't know the person. I work full time, my husband works full time, so it's difficult. My biggest complaint is we would like an appointment on a Friday afternoon because his school does a half day on a Friday afternoon, and I have to fight constantly to have…. And I can't get these appointments

And they say no because they don't have the staff here. So it's maybe under staffing that I don't understand".

Some patients reported that they would prefer to be treated at a local clinic rather than travelling long distances. Parents of special needs children felt that their children would cope better if treated at the school rather than being referred to hospital.

"R: The only thing is, we live in Ayrshire and it's got its own dentist so…it'd have been more convenient for us to go to our own.

"I would say to try and maintain the importance of the needs of the children with special needs. Years ago when he was young, the dentist used to visit the school, and in their own surroundings with special needs schools. They would visit the school and do the dental examinations there in conjunction with the child going to a dentist or coming to Children Hospital. So there will be some parents that will be happy to do that, to go to hospital and persevere with their child, but I think there's a lot of parents that won't be able to cope. They'll have one bad

experience and that will stop, and that is detrimental to their child's oral health. So if they're not seeing somebody at school, not going to a local dentist, and they're not accessing a hospital dentist I think that's bad".

Benefits anticipated

It was perceived from the interviews that patients treated in the paediatric dental department were anticipating functional benefit, dental health benefit and social benefit e.g. able to see dentists regularly without phobia.

"He's become a bit more tolerant of me brushing his teeth, because he doesn't understand the concept of brushing teeth. So through time, and obviously the guidance.

"To get rid of all the decay the daughter has in her teeth and to get them all treated".

"Well, obviously she's not going to have infected teeth there, and long term care for her mouth".

"To ensure that her teeth are operating properly. She'll have a healthy life".

"The dentist here has worked with autistic children before, and he's got quite good techniques at getting them calm and to cooperate. So it gives us the reassurance that between the two dentists his teeth are being looked at".

"Her benefits are both going to be her appearance, and she's going to be able to chew properly, because with the gaps she wouldn't have functioned properly and her jaw wouldn't have been in line. So it's a bit of both".

8 Workforce Perceptions

8.1 PDS Specialist's Perceptions

Semi-structured interviews were conducted to investigate the perceptions of a representative sample of specialists in paediatric dentistry. Seven specialists based in the PDS were interviewed across Scotland.

A topic guide was used to interview specialists to ensure relevant areas were covered (see Appendix 23).

Referral criteria

It was perceived from the interviews that PDS specialist services across Scotland did not have specific referral criteria. They accept children from birth until eighteen years of age in full time education who are not suitable to receive care in general practice settings. Some specialists reported that they accept children who are too anxious, or who have additional needs of some description or complex medical conditions.

> "I would say our criteria, we accept pretty much any child that can't receive their treatment with a GDP."

Children are referred to the PDS by GDPs, National Dental Inspection Program (NDIP), Childsmile Dental Health Support Workers, Health Visitors, Social Work and other professionals that come across children. It was also reported that, in some Boards where access to GDP services is limited, referrals are made for continuing care.

Common treatments that were carried out by the specialists in the PDS service are management of caries, trauma, extractions under GA, inhalation sedation (IHS) and intravenous (IV) sedation in some NHS Boards, molar incisor hypomineralisation (MIH), ulcers, swellings, impacted teeth and hypodontia.

Change in prevalence

Specialists across Scotland reported that there is a reduction in dental caries among their

patients but reported that there is a big increase in MIH and GA lists. In some areas, specialists reported that they treat teenagers with gross caries.

> "I see teenagers with really bad caries. I wouldn't like to say that's going up. It might be because I run an IV sedation service and those are the children that find their way into that service".
>
> "I've seen quite a lot of MIH since I started but not necessarily referred in for MIH, but just referred in probably for caries from GDPs but have been picked up as MIH".

Service provision/service model

The PDS provides dental care for child patients in the community who cannot typically be treated in the general dental services. Most PDS clinics provide treatment under IHS and GA, IV sedation is also provided in some NHS Boards. Children with no specific disability may be sent back to their GDP after a course of treatment but children with complex needs often remain with the PDS until they are 18 and are then transferred to adult special care services. It was observed that most NHS Boards have a management plan for children who are in the transition stage.

Some specialists felt that children did not need to be treated in a dental hospital or children's hospital setting if the treatment does not involve multidisplinary care or the need for treatment under GA. It was argued that the specialist expertise should be available locally as much as possible to prevent patients having to travel long distances or wait longer for the treatment. It was also argued that if a specialist is based locally and is able to provide sedation, there is less chance of patients being referred for GA. This is viewed as more cost effective for the service and more beneficial to patients.

> "… if you've got a specialist working in the PDS clinic, and you're set up for sedation, your conversion to general anaesthetic for treatment is lower than if you see all those patients in a hospital setting".

Specialists viewed the provision of dental care in the local community setting to be good practice and patient centred. They reported that clinics based in the community can often

liaise more directly with medical practitioners, health visitors and social work colleagues as they may share the same premises. It was observed that specialists were very aware of the socio-economic, demographic and working profile of the population of patients they manage.

"I think the difficulty is you do have a concentration of specialists and consultants in hospital settings, and while I think that's a good idea to have centres of excellence, I'm not sure that that's always the best place for that level."

"I had a child this morning where the child has certainly got needs but the mum has got probably more needs. And we will bend over backwards to make sure the child is seen".

"We're seeing a group of children who are very deprived."

Workforce/ skill set/ workforce model

Specialists views about the workforce available in the PDS were variable. Some reported that they need more specialists while others reported that they have an adequate number of specialists. They agreed that the specialists should be based in the PDS with one or two regular sessions in a dental hospital. Specialists felt that by doing a session or more in hospital they would be able to develop further and also provide an appropriate clinical network with consultant colleagues.

"You're going to need more specialists, not based in dental hospitals, because that's only Dundee, Glasgow, Edinburgh, Aberdeen. There are huge areas in between, there's lots of population. So I think we're going to need a much more localised specialist service but it must have backup of access to general anaesthesia because there are times we can't do stuff without that".

"I think it is important for people that are PDS based to have hospital experience and vice-versa."

It was reported that the majority of staff who work in the PDS are dentists with an interest in treating children but the presence of specialists enables the PDS to deliver complex treatment locally because there is access to specialist care, guidance and support.

"We're fine. We've got a good workforce, they all do a bit of everything and they're all keen and committed to working with people who need a bit more than they can get on the High Street".

Some specialists felt that the service they are providing was limited due to absence of infrastructure and support, both clinical and administrative. It was felt that GDPs do not always have an incentive for treating children as they feel they are not remunerated appropriately for the time which is necessary to treat children, and some GDPs may not have the skill set to manage children with challenging behaviour or special needs.

"I think treating children under the GDS regulations in general practice is funded at such a level that I don't think you could expect hugely… I'm maybe speaking out of turn here, but hand on heart I just don't think there's a great incentive for general practitioners to do paediatric dentistry well because I don't think they're remunerated appropriately for the time which is necessary".

"You can do a lot of damage to a child if they're not treated sympathetically, if you like, in the early years."

Specialists reported that networking with Consultants in Paediatric Dentistry and other specialists would significantly improve the delivery of care in the community. It was perceived from the interviews that the specialists felt that they were on their own in the community.

"I think it's a mind-set thing, because consultants particularly and specialists do like the hospital setting because it's a more solid structure. If you're in community you're a bit more on your own."

"I do think that the PDS would be strengthened greatly if the specialists/consultants within the hospital setup were included within the PDS, which I understand is perhaps what's going to happen. I know we're supposed to be joining up with them. I also know there's a bit of resistance to that idea. But it makes an awful lot of sense, because if we're doing the same job essentially for the same patient group in the same part of the world, we should be all part of the same team. But there is a kind of them and us…"

Some specialists who have been appointed at non-specialist level (e.g. SDO) reported that they are delivering care at specialist level. It was also perceived that some staff in PDS are not promoted despite having qualifications. This was felt to be due to limited funding.

It was reported that in some areas there are more consultants compared to specialists who

can work in the community but this is because there are not enough specialists.

> "I think we're top-heavy with consultants. I think you'll find there are more consultants than we have specialists. And that's a top-heavy pyramid, isn't it?"

Some specialists who are close to retirement stage reported that they might not be replaced appropriately as they felt number of specialists in training is inadequate. However, others felt they were training enough numbers. There was also a worry among some established specialists that, after training to a specialist level, many younger specialists seem to continue to post-CCST /consultant training which may lead to an inadequate number of specialists available to fill PDS posts in the future.

It was suggested that dentists "with a special interest" might bridge the gap between dental officer/general dental practitioner and specialist. Postgraduate qualifications and/or training in paediatric dentistry, sedation/GA and managing children with special needs should be made available to PDS dentists so that they can gain additional skills and experience.

> "We are struggling because it won't just be me that is due to retire, there must be a cohort of us who got onto the specialist list without formal specialist training. It was created in '99, and a lot of people got grandfathered on. And they're due to retire, and we haven't got the equivalent cohort."
>
> "I will retire in less than three years' time, but I hope that there's enough people been trained who want to stay as specialists and not go on to two year, further training to be consultants. The other barrier I think in Scotland is you're training people who aren't necessarily Scottish and who may not settle in Scotland long term."
>
> "What I would like to see is maybe what they call in England a special interest or a particular interest where you're not a specialist but you're able to cope with kids that maybe general dentists aren't."

Gaps/improvements

1. PDS referral criteria should be developed nationally and standardised as much as possible so that there is more consistency across all NHS Boards in how child patients are accepted and treated.

> "I think to have a national standard rather than just a "well, in Lothian we do it this way and in Lanarkshire we do it this way, and in Greater Glasgow it gets done this way." I think that's not helpful."
>
> "There would have to be local variation to address local needs and taking into account the availability of a dental hospital."

2. Specialists could take more responsibility for children in special needs schools and departments of additional support within 'mainstream' schools to coordinate their dental care. If clinics are available in the school setting, they should be used.

> "I think one of the missed opportunities we have is the clinics that are within the special schools. I think there is a need for specialists to be working in the special schools in those clinics rather than having the children from the schools going to the hospital. The specialists should go to the school where the clinics are and that's where the treatment could be provided for them."

3. Specialty registrars should spend some time in the PDS to broaden their experience.

> "I think we need more specialty registrars coming out, maybe shadowing for a week or two, so they realise some of the issues of when you're not in a dental hospital environment. Some of the good points, but some of the issues that the buck stops here, you've got to make the decisions, you've got to realise you've got to do all the follow-up. You've got to make the links. How does that feed in with other management things? It's quite different from working in a hospital."

4. Local managed clinical networks (MCN) should be established to include consultants, specialists and non-specialists based in primary and secondary care.

> "I think it would be quite nice to have it as a much more managed clinical network where maybe if you were linked to a hospital a consultant comes out and you maybe have more overlap with them. I'm probably quite lucky because I've worked in both environments so I know the consultants that are

there so I can kind of link in with them if I need to".

"I do think that the PDS would be strengthened greatly if the specialist/consultant within the hospital setup was included within the PDS."

5. The current GP17/SDR system is not appropriate to gather the information regarding the work output/activity of paediatric dental care in the PDS and often does not facilitate appropriate treatment, especially for specialists. The SDR does not include many procedures a specialist might provide e.g. composite restoration of malformed or hypoplastic teeth, bleaching, stainless steel crowns on first permanent molars, fissure sealants of teeth other than permanent molars within 2 years of eruption. It also does not reflect any work in multidisplinary clinics for children with hypodontia, cleft lip and palate or significant medical conditions. However, there may be potential to use special codes in the SDR.

"It'd be nice not to need to use the GP17 paperwork and terms of the dental remuneration. It's of no material gain to us. And it's very time consuming. But to say that we've to work to the terms of dental remuneration is actually so out of date. We're not using amalgams in the same way. It doesn't cope with bleaching, it doesn't cope with a lot of things that we do. And it won't let you do stainless steel crowns on sixes. It doesn't let you fissure seal an E, and that might actually be the best thing for that tooth. We do it, but there's no way of showing our work out. And you just think it's pointless because they're not even collecting accurate information."

6. In some Boards, where the PDS activity in hospital is not recorded appropriately, arrangements should be made to record activity to reflect work carried out by the PDS.

"What's bizarre is on the general dental service recording that my activity is recorded for assessing a child, looking at the radiograph, and for treatment plan, but the work I do when the child's asleep under GA is not counted. We're chasing that up at the moment because it kept being labeled under oral surgery. And I kept objecting that this was wrong. Because it's not under maxillofacial or oral surgery, it's under, as I'm concerned, Paediatric dentistry".

8.2 Hospital Consultant Perceptions

Semi-structured interviews were conducted to investigate the perceptions of a representative sample of Consultants in Paediatric Dentistry. Eleven Consultants based in three dental hospitals participated in the interviews. A topic guide was used to ensure relevant areas were covered (see Appendix 24).

Referral criteria

Consultants' views on referral criteria were variable, with some consultants reporting that they have specific referral criteria, while others do not. Some consultants stated that they would like to tighten their referral criteria, while others stated that they would accept inappropriate cases/routine cases or cases that could be treated in local PDS for their undergraduate students. On the whole, it was perceived that consultants felt that there should be an agreement on how much routine care can be accepted in hospital service. In some areas, new referral criteria were being developed due to integration of the PDS with the hospital service.

"We do not have referral criteria, but that said, we may, depending on what transpires at the actual new patient consultation, advise they go back to their GDP for the treatment or attend a student clinic or whatever rather than necessarily get specialist-type treatment".

"We don't really have referral criteria. We try and follow the guidelines that are BSPD set guidelines and we generally will have a look at anything. What we often find is it's the same dentists who send children in because they don't feel very comfortable treating children".

"They may be inappropriate for a specialist or a consultant to see, it may not be necessary, but we will then triage them and see them on the student clinic".

"We need an agreement between the consultant body and our management team as to what referrals we are going to continue to accept, and how we're going to decide how many of that basic level of patient we're going to keep taking, maybe patients who more urgently need hospital-level paediatric dentistry, multidisciplinary care, sometimes are disadvantaged because they end up waiting longer than they should".

It was also stated that referral criteria should be developed and agreed at national level so that there is consistency across dental hospitals in Scotland in the way the paediatric dental departments accept patients. Some consultant believed that, if the patient does not need multidisplinary care/complex treatment, then they should be treated in the PDS.

"I think what we need to do is probably tighten up significantly on our referral criteria. I think we would be happy to do that as long as it's part of an agreed and accepted plan. Not just within this health board but across, because the dental hospital takes referrals from a number of different health Boards".

"And if it isn't of a complex nature then potentially a PDS practitioner should be able to provide it".

Referral pattern

Consultants reported that they receive referrals from GDPs, the PDS, medical consultants and specialist nurses.

The referrals received from the PDS and medical consultants tend to be complex, while the referrals received from GDPs sometimes tend to be for a very basic level of care, anxiety management, difficulty in cooperating with routine treatment, and the management of dental caries. Generally, they feel that these cases get referred in large numbers because GDPs are not sufficiently remunerated for the amount of time they spend on child patients. It was reported that consultants accept these cases in the interest of the child. Consultants stated that they felt the PDS service is not spread out geographically and therefore not used widely by GDPs.

"A lot of the patients that were referred from GDPs are for routine care, for anxiety management, difficulty in cooperating with routine treatment, and the management of their dental caries. These get referred in large numbers because they are time-consuming patients to treat, and my feeling is that general dental practitioners send them in because they're not sufficiently remunerated to make it economically viable for them to provide a treatment".

"I think probably children would still not be accepted for treatment by general dental practitioners

because of the lack of a proper economic model for them to provide a standard of care that isn't going to mean they're continuously financially out of pocket".

"We sometimes write back to the general dental practitioner and say "this patient is not appropriate for the hospital, please send them to your local PDS." And they'll write back again and say I don't know who that is, which I find astonishing".

Consultants felt that specialist paediatric dental departments should accept referrals for cleft lip and palate, trauma/complex trauma, complex hypodontia, severe behavioural problems, congenital abnormalities, and complex cases requiring multidisciplinary dental or medical care i.e. cases requiring an input from orthodontics, restorative dentistry, oral surgery, oral medicine, haematology, cardiology, or oncology on an ongoing basis. The less complex ones should be managed within the PDS. For further details see the recommended referral protocol.

Prevalence/demand

Consultants reported that currently they do not see demand for private specialist paediatric practices as much as in England where some specialists have started private services.

"There isn't that kind of demand. I know in England there are a few people now who are working as independent contractors or private specialists. I know people from London and Leeds, but it's not happening in Scotland".

Consultants reported that they are seeing an increase in MIH and gingival hyperplasia cases. The consultants speculated that MIH was always present but, because of higher caries prevalence, the teeth that were damaged by the hypomineralisation process had become carious and were extracted. Therefore, due to the decrease in caries levels, they are seeing more MIH.

"There seems to be an awful lot of MIH. It wasn't a million years ago that I was a dental student, but we didn't even get taught about it. I'm sure it was there because you can see it in some older people, but every single one of my new patient clinics has at least three MIH patients. It just seems really

prevalent".

"There's increasing numbers of children who are attending with things like molar incisor hypomineralisation that is complex".

"I think we probably see a lot more of a condition called molar incisor hypomineralsation than we used to do, MIH".

"Definitely MIH, I think we're seeing more of."

"I see increasing number of children with gingival hyperplasia. I think overall the demand and expectation that we should be doing more for these children".

"We've seen an increase in what I would call molar incisor hypomineralisation, particularly with poor quality first permanent molars. Whether that is actually a genuine increase in the prevalence of this, or the fact that the caries rate is decreasing and therefore we're seeing it for what it is, and not just as very advanced caries, I'm not sure. But there is an increasing prevalence across Europe, and I would say that our department is measuring that".

Some consultants reported they have not noticed any change in prevalence of caries. In some areas consultants reported that they are noticing reductions in GA lists, while others reported that there was an increase and they were being asked to undertake extra GA lists.

"I personally don't feel that it's that much different".

"I guess it's pretty much the same".

"We still get lots and lots of caries. There are pockets in and around Glasgow for whom all these changes have had a very minimal effect. And obviously we continue to hope that in time things will improve but in Glasgow particularly it does seem to be very slow. So no, I don't personally perceive there to be much change in the types of patient that I'm seeing".

"GA waiting lists seem to have increased. We are regularly asked to do extra lists".

"GAs, they've definitely gone up".

"We appear to have a high demand for the GA service. I don't have the figures, but in my head it's not

decreasing, because the number of Paediatric assessment clinics that appear to be running just now are quite high. So there seems to be a continued high demand for that service."

"We've actually reduced the number of sessions that are carried out. The type of patient referred remains the same, though, and that's the high caries risk. So yes, there has been some change".

"There has been a definite reduction in referral for general anaesthetic extractions."

Service provision/service model

Consultants felt the majority of the anxious children who are referred to hospital could be managed in the PDS by a dentist with a special interest in treating children.

"A well trained public dental salaried dentist can probably manage 90% of the anxious children who are referred…you know, like the dentist with special interest type model".

There was agreement among consultants that patients should be treated in their local PDS unless the patient requires multidisplinary care. Consultants reported that it is often easier for patients to travel to PDS clinics and rearrange appointments.

"I think the flow of patients through PDS clinics is often a much better flow than it is through dental hospital. I think a hospital can be much more bogged down in its administration of the service. I've found that in all of the hospitals I worked in that it's much harder for patients, for how patients manage to change appointments, how easy it is to get to the hospital. It just seems to flow much better in PDS".

Some consultants felt that the establishment of a clinical network in PDS settings would be beneficial. It was acknowledged that, due to geographical issues, a consultant or specialist cannot be local to everyone, but a network approach with consultant or specialist support would be possible. Some consultants argued that this model of network will help specialists/consultants to keep up their skills and would be more sustainable if someone leaves.

"Better networks in the middle ground so that children can receive appropriate level of care close to home and in a timely fashion".

"Create a network. For somewhere like Tayside, Grampian, Highlands, where you've got huge geographic issues to deal with, you couldn't have a consultant or specialist local to everyone, but you could have a more networked approach……..I know Grampian has got a real problem right now in terms of they've lost their staff".

"We need an MCN. I don't think we have it at the level that we'd want it to."

"I think the theme that we've come across is this idea of networking, managing the service in a particular way. It could be done in a better way, but it would require quite a bit of…resource".

Others felt that the PDS and hospital service should work closely as an entity which would require agreement in terms of clinical management, responsibility for treatment plans and various other things. In some Boards, integration between the PDS and dental hospital has already started. Consultants in some areas felt that consultants should be based primarily in PDS, as in England and Wales, which is working very well.

"The ideal model is that PDS and the hospital work very closely together as an entity. But that requires agreement on terms of clinical management and responsibility for treatment plans and various other things that I think is always potentially a point of conflict".

"And also it's about maintaining relationships. It's not good never meeting… there's a huge value of face to face time, working together".

"It's about linking the services together for children".

"I don't believe that a consultant has to be hospital based. I think the model south of the border has worked very well".

Overall, consultants agreed that service provision should be patient-centred where a patient could access care close to home so as to minimise disruption to the child's routine.

Workforce

Middle grade staff:

Consultants agreed that service provision is very inefficient and would be much better if they had middle grade staff. In the absence of middle grade staff, they depend upon training grade staff for service provision. This has an impact on providing emergency cover and adds to the delay in patients going through treatment sessions. Appointment of middle grade staff would greatly increase the efficiency of the department. Please see comments from hospital patient interviews regarding waiting time and duration of treatment.

"So if we were to target a single area now where we felt we needed additional help to manage our patients efficiently through our service it would be to have middle career grade staff appointed".

"There are no staff grade appointments any more".

"Staff grade isn't a post that exists any more".

"We're struggling from the point of view that we don't have enough dentists with extra knowledge about children".

"If we had one or one and a half career grade staff in who were delivering services, it would make an enormous difference to our ability to get patients efficiently through the system and back out into primary care in a timely fashion rather than all the slow-turnaround gaps in treatment."

Consultant workforce/workload:

Consultants across Scotland reported that staff numbers are small and they are stretched and under stress. Management often ask consultants to undertake extra clinical duties to meet the waiting time guarantee.

"The thing I notice about my workload is the constant messages from management to ask if I can do an extra clinic here or an extra clinic there because the waiting list is breaching."

"We're very short staffed, I think, is the only way to put it. In the NHS side, we only have a full time member of staff as the NHS consultant. We lost our NHS specialist at the end of the summer to go to

Dubai…… That's it. So we are pretty stretched."

"We're short of a consultant just now. So the consultant we do have is doing a lot more than she should."

It was reported the consultants feel pressured due to inadequate staff numbers and the capacity of the paediatric dentistry department has gradually reduced over the years as staff members who retired or left were not replaced.

"We have a lot of pressure."

"The workload is high, it always has been high. It's a high pressurised job".

"I certainly know that we don't have the workforce to treat that we used to have. So it may feel as though we have higher demand because we don't have any associate specialists now on our team, we don't have any staff grades. We have two specialty registrars and we have one higher specialty registrar, but she's doing a PhD. And they're also reducing the number of Core Trainees that we get. So our capacity to treat, I guess due to the resources having been reduced over the years, has reduced."

Consultants also reported that they love their job but it is stressful as they are constantly trying to accommodate patients. They do not want children waiting longer than they are required to. As a result, they work extra evenings and administration time is often reduced.

"It's always squeezing patients in, it's always being asked to do extra, it's always running into your admin time, it's always working extra evenings. It's also knowing that children are waiting longer than they should do".

"I actually really love my job and I love treating anxious kids. I love it all. But it does make it stressful."

Consultants reported that the actual whole time equivalent (WTE) of the workforce is smaller than the head count and the number of sessions of direct patient care is again smaller. Some Consultants believed that the hospital service provision in Glasgow, Edinburgh and Dundee is adequate, whereas the hospital service provision in the remaining NHS Boards is inadequate. However, Consultants in Dundee reported that they are short staffed as they

have only one full-time consultant, and a specialist recently resigned.

"I think you need to be very careful with what the workforce appears to be, because there's a difference between numbers and the people you have". But if you look at that as actual whole time equivalent it's actually much smaller than that. And then if you look at whole time equivalent of what they provide for the NHS… and when you look at time allied to the NHS, it's probably about four sessions".

"If you look at the health board distribution it's relatively well weighted towards Glasgow, Edinburgh and Dundee. And that is fairly weighted for the population, but in the Borders, Ayrshire and Arran, Western Isles, Orkney Isles, Shetland, Grampian, Highland, we have no specialists at all. So the hospital provision in there is completely inadequate.

It was reported that the academic members of staff are often asked to do extra sessions which has impact on teaching sessions. Academic consultants felt that the hospital management do not have an understanding of an academic consultant's job.

"The NHS relies too heavily on its academic members to cover when NHS staffs aren't here. And so they're asking academic staff to give up their lecturing and teaching jobs to cover an NHS duty, which is wrong."

"So my main comment to your question would be there is a lack of understanding in NHS management over what an academic university is doing."

Training

Consultants reported that they are not training enough specialists due to lack of funding and lack of interest in the specialty. Consultants believed that students are not opting for paediatric dentistry because the specialists who have trained previously were not successful in finding employment as specialists. It was reported that some specialists have been employed at non-specialist level (e.g. SDO) in the PDS.

"We don't have any post CCST, NHS trainees in Scotland at the minute".

"We're not training enough. And we're not giving them positions in primary care that they should have.

"I think that's because there's this perception with Paediatrics that there's not this career pathway, it's not planned out. They're going off into orthodontics"

Gaps/improvements

1. Dental Trauma

Consultants believed that, in some NHS Boards, the management and referral of dental trauma in primary care is poor. It was suggested that courses on management and referral of dental trauma should be made available to dentists.

"The one thing that I do think is managed really badly is trauma in primary care and the inability of dentists to know when to refer trauma."

"I think it's something that the consultants in Scotland need to take on board and actually make a plan to deal with dental trauma, in some way get an education to dentists or get them to know that is one thing that should be referred in promptly for a specialist or a consultant."

In some NHS Boards, Consultants also reported that management of dental trauma during out-of-hours is not adequate. It was stated by some that dental trauma should be treated by a specialist while others felt that dentists with a special interest could assess and treat dental trauma. Generally, consultants agreed that an accessible care pathway for trauma patients should be developed across Scotland.

"I think one of the issues that I've found particularly is management of dental trauma, and the provision for dental trauma out of hours. Anything out with Monday to Friday, nine to five".

"I think trauma needs a specialist."

"Dentists with special interest can handle trauma."

"I think there ought to be a readily accessible care pathway for trauma patients."

2. Remuneration/capitation fees for children's dentistry

Consultants across Scotland felt that remuneration for carrying out children's dentistry in

GDS is inadequate and the SDR is outdated. It was reported that there was no incentive for dentists to treat children due to low remuneration and the time taken to manage a child can be significantly more. It was suggested that dentists treating children should be appropriately remunerated.

"Payment to general dental practitioners for treating children has to be changed. It has to be because it doesn't work. It only works for them if a child has a very low treatment need and is a cooperative child."

"Biggest victories for children's dentistry would be if we could make the argument that these items of remuneration or the capitation fee, which is what they get for children, needs to properly reflect the amount of time it takes."

3. Childsmile Dental Health Support Workers (DHSW)

Some consultants felt that Childsmile DHSWs should liaise with the hospital service to target children who are at risk of decay and deliver primary prevention. Some consultants felt that they do not have the same tie-in as a health visitor does with DHSW and therefore are unable to refer at-risk children to a DHSW. DHSWs can support families at high risk of dental disease, encouraging the patient to attend a local practice regularly. It was reported that some consultants are trying to liaise with DHSWs to support children with welfare concerns.

"There's not the same tie-in that we could approach Childsmile and say can we join in to your health support workers …. Every time we discharge somebody who's had multiple teeth extracted for dental caries, theoretically they and their siblings are the ones that are at risk. These children should be given to the DHSW to make sure that they are registered with a practice and support the family. And we don't have that."

"Through Childsmile in terms of making sure you're definitely attending the dentist." If you've got somebody coming in for extractions … they're very high risk, and therefore we want to make sure that this doesn't happen again. What support are we giving them?"

"I do a lot of Child Protection work, we call them comprehensive oral assessment, part of the comprehensive medical assessments for children with welfare concerns, and what I would really like

to do with that, is to get dental health support workers linked in with these families".

"These are families that we know have welfare concerns and we know that some of them are oral health concerns and not getting taken to appointments. We tried probably about two years ago to get links with dental health support workers…. then nothing happened".

4. Dental Assessment for oncology and other high risk patients

Consultants across Scotland expressed concern regarding the dental assessment of children with cancer and other high risk conditions. It was reported the children are not always referred for dental assessment by medical colleagues unless there is a dental facilitator on site, and several children have not had their dental assessment before chemotherapy.

"Guideline document states that children with cancer should be assessed prior to starting chemotherapy to assess their dental condition…. But we know that it's not done as well as it could be, particularly in centres where there's not that on site dental paediatric presence".

"There's always cases. There's a lot of children with cancer. And there'll always be cases where somebody slips through the net. We have people going up to the wards two or three sessions a week to try and constantly see the kids on the ward and then hopefully if there's a new referral, it will be direct contact, face to face. The management doesn't log these contacts with us as important because they don't come through an official referral pathway on a sheet of paper. And they asked us to quantify them, well, they're different every week. It's impossible".

"We have a system whereby for all our medically compromised patients, when they're diagnosed they're actually referred to the dental department. Now, obviously that requires the medical person involved in their treatment to actually physically refer them, because we don't know who they are unless we're told. But that is a system that we have. We are expected to be told, well, we don't know it if they don't tell us about the patient".

In some areas, patients with dentinal decay have been through chemotherapy sessions without a dental assessment as a result of services not communicating or liaising with each other. Consultants felt that, since there is no official referral made, they are unable to

quantify the numbers of patients they assess during their visits to the wards.

> "We were having a chat, looked in his mouth and there was obvious decay, and fairly significant decay, which for a child on chemotherapy is not good news at all because if he gets an abscess it's potentially life threatening because he's got no immune system. But because his care was such that he went to three different places and nobody took the time to do the dental assessment, we're now either going to have to organise something really difficult or we're going to be crossing our fingers for four months and hope that he doesn't develop an abscess. He's in that really high risk group we talked about. He's been excluded from school, he's got a police record, his social circumstances are pretty poor and he's already got high levels of decay. We can give all the dental advice we want to that family but I have severe doubts that they will change. And the chance of him developing an abscess is pretty high. So that's the sort of case that's really worrying."
>
> "I've got a child who is on the waiting list at present and should have had a general anaesthetic for their teeth, and in the waiting list entry it said 'treatment no longer required as the child has finished chemotherapy'. But the only reason the child finished chemotherapy is because they were about to have a bone marrow transplant".

It was reported that various initiatives to improve dental assessment have been undertaken by paediatric dental departments e.g. audits, referral paperwork for routine referrals from medical colleagues, part of core trainee induction and development of patient information leaflets, but there has been no major improvement in referral rates.

> "We've done various initiatives, joint initiatives, we now have the Core Trainees, every single rotation in oncology having a dental presentation, so it's part of their induction. We created paperwork for the doctors to send us referrals routinely on assessment. We did various audits which showed if we put loads and loads of effort in on an ongoing basis that they had a better uptake of referrals to us. We also have worked quite hard to make sure there's Core Trainees screening on the ward. However, it appears that no matter how much we have been doing, dental care is not seen as a priority until it's a problem. It's very difficult."
>
> "I created an information sheet for the parents so that they knew all about what mucositis was and what the role of the paediatric dentist is in the care of children with oncology. And it's very frustrating

when you go up to the ward and the leaflets aren't there. They're not out."

"There are cases that I see where you just cannot understand why the dental treatment has not been done. I'm sure if you looked at them case by case there would be reasons for each of them, but at the same time I do find myself chasing things up a lot of the time."

Consultants suggested the dental assessment for high risk patients should be supported, evaluated and reported nationally.

"I would not have confidence that we see every child that has cancer, because I don't think the pathway is reliable enough yet, and it's because we have not had the resources to work on it. If you're doing a new patient clinic where you're constantly running an hour over, every new patient clinic, you do not have the time to then spend going and working on… basically, a lot of the consultants here use all their SPA time doing clinical related administration".

18 week/waiting time

The Consultants' view about the 18 week waiting time was variable. Some consultants reported that they are meeting the 18 week waiting time and there are no problems.

"We're working to the waiting time guarantee".

However, others reported that they are under pressure due to 18 week referral to treatment target (RTT) and it is causing detriment to other areas. It was reported that the waiting time target is met for the first appointment and the patient is taken off the waiting list as soon as treatment starts. Patients wait much longer for follow-up appointments and do not complete treatment on time. In some areas, the treatment sessions are cancelled on a regular basis to schedule new patient appointments, but the management appeared to be not concerned.

"It's also because there's a lot of pressure on that waiting list, there's very little leeway in terms of leaving any space if you have any emergencies or whatever".

"I think overall having eighteen week RTT is actually, to the population, beneficial, because it has driven finance in those areas. Whether that's to the detriment of other areas…".

"So what happens is if your new patient clinics are starting to breach and not be seen within the time, what won't get cancelled is a new patient clinic but what will get cancelled is a treatment session. So you can see patients are waiting longer to get treatment done."

"So what it's doing is prioritising one type of treatment over another and it's prioritising one type of treatment which has a waiting list guarantee over a type of treatment which doesn't have a waiting list guarantee".

"Well, of course, that's of no importance to the managers. They don't care about follow-up treatment. They're only concerned about waiting list times for the first appointment."

"The only pressure that we have are the first appointment and for GA".

"There is only a treatment time guarantee for the first appointment, and for the time that you're on a waiting list for a general anaesthetic".

In some areas, consultants reported that 18 week RTT is not being met for inhalation sedation and intravenous sedation.

"For inhalation sedation I'm pretty sure that we're not meeting our eighteen week target on that."

"If they're looking for inhalation sedation, it's probably a number of months. If they're looking for intravenous sedation, equally a number of months".

"The inhalation sedation waiting list is long."

PDS

Consultants reported that they felt some children could be treated in the PDS by a dentist with an interest, while some complex cases could be treated by specialists in the PDS.

"95% of children in this country don't need a specialist. They need a good dentist, or part of a dental team (therapist), who are interested in looking after children and providing regular care, I see them in the PDS rather than the hospital service".

"We just want good dentists who are good with children and who just want to do the regular care, maybe without the razzmatazz".

It was reported that some of the services provided by hospital paediatric departments could be delivered in the local PDS. Some consultants reported that they were treating patients in hospital who could be treated by a specialist in the PDS.

"A lot of the services that are delivered here could be better delivered by the community service if there was staff, specialist staff, in the community service".

"I think I potentially am treating patients that if there was a community based specialist who could treat them in community type setting".

However, it was acknowledged by consultants that the PDS service does not always have adequate staff and facilities to deliver services. Some consultants reported that they felt the PDS is not making the best use of the staff and their skills e.g. some specialists employed as dental officers, rather than specialists.

"I think that if you had a better staffed specialist-led service in the salary service you wouldn't need as many of them here and you could do some of the more complex stuff here".

"We have a very supportive PDS service. However, I think they also need additional resources".

"I think there's definitely overlap and there's ways we could manage the pathways better, more efficiently, where you probably would end up seeing a lot more children in the PDS and reduce the waiting times in the hospital dental services. But it has to be managed properly and there needs to be resources put in place".

"I think they're over utilising some staff for the grade that they're being paid for at the moment. So I think the health board is getting a really good deal out of them, but it's not actually fair to those individuals. But even at that, they could be doing a lot more. They've got the capability to do a lot more if they would be given the rein to do that."

Networking with the local PDS seems to be a way forward and recently some PDS specialists have been involved in hospital GA assessment services, which has reduced the burden on the hospitals, as the specialists have taken these patients to their clinics in the PDS.

"Since the public dental service staff have been much more involved in our assessment service for general anaesthesia they are taking quite a lot of these patients back with them to their health centre and providing restorative care for them locally".

In some areas, the local PDS was delivering continuing care for patients with special needs and to patients who were not treated by the local GDP due to lack of skill. It was reported that delivering routine continuing care by the PDS is not looked upon favourably by their management, even where there is limited access to GDP services.

However, it was suggested that the PDS should continue to deliver continuing care for patients in remote and rural areas where the access to a GDP is limited.

"There's a lot of tension, I think the management team here would like general dental practitioners to actually be providing a higher level of interventional care for their patients rather than referring them to PDS. They don't want PDS to deliver continuing care; they don't want them to do that because they say they don't have capacity in the public dental service to take on all these additional patients".

9 Hospital Service Stakeholders and Facilitators Perceptions

9.1 Hospital Service Stakeholders Interviews (Oncology, Cardiology and Hematology departments)

Structured interviews were conducted to investigate the perceptions of a representative sample of paediatric dental department service users e.g. oncology, haematology, and cardiology departments from Edinburgh and Glasgow Children Hospital. The questionnaire is attached in Appendix 25.

Several attempts were made to gain participation but due to the transfer of services from Yorkhill to the Royal Hospital for Children in Glasgow, it was not possible to gain commitment.

Overall, five consultants from oncology, cardiology and haematology departments participated in the interviews.

Importance of the paediatric dental department services

It was perceived from the interviews that the paediatric dental department routinely provides services to high risk patient groups. Consultants described the service as an essential one which plays an important role in reducing morbidity of child patients with high risk conditions.

> "It's important because it reduces our morbidity. If we have good dental hygiene, if we make sure that their teeth are as good as possible preoperatively, then that improves our long term results."
>
> "It is important service because of the risk of infection for oncology patients and risk of bleeding for the bleeding disorder patients."
>
> "It is important mainly because a lot of them are problems with endocarditis and things like that are from the mouth, so especially children, quite a few of them have appalling dental hygiene".

It was reported that children with high risk conditions often have poor oral hygiene and therefore the risk of dental infection is generally high. The paediatric dental departments' role is to prevent dental infection by treating and managing children prior to any surgical procedure. The service was also described as a specialised service which cannot be offered

in the community.

> "There is a terrific tendency for a lot of our patients to have poor dental hygiene. And plus because they've got heart disease, their mothers think they've got to be nice to them so they give them lots of sweets and treats and they tend to have poor teeth. And as I say that's where a lot of our infection comes from. So we tend to be very keen that their teeth are good."
>
> "Patients can't get their treatment in the community, it has to be specialised and that can't really change, it's not really going to change".

It was reported that child patients cannot wait long for dental treatment due to their medical condition and have to be treated immediately. Therefore, the paediatric dental service has to be flexible and accommodate child patients at short notice if required.

> "It is really important because these patients cannot get dental treatments outside so it's important that it's timely if they have an urgent problem. If they have a semi elective problem you don't want them to wait longer than they would wait in the community to have something done or that causes frustrations for families."
>
> "Given how problematic dental care is in the west of Scotland it's really important that we have prompt access to dental services. It's an important part of the service."

Some consultants reported that their departments employ dental hygienists to monitor the oral hygiene of their child patients.

> "Really just because dental health is so poor in the West of Scotland, and one of the most frequent reasons to have to treat a patient with a bleeding disorder with factor products, which are quite expensive, is to facilitate dental treatment. So there's a drive to try and improve their dental health and because all of them, even if we tell them to go to their local dentist, don't necessarily go, so, we have a dental hygienist that helps us screen out early problems."

Referral pathway and patient assessment

It was perceived from the interviews that some departments were actively developing referral pathways, whereas others do not have referral procedure. Child patients are mainly referred verbally to the paediatric dental service and in some cases e.g. oncology, child patients are put on the list by a paediatric dental consultant/nurse during the ward round.

"At one point there was a dental referral form that we had. I think xx helped to arrange for that. But certainly, personally, and the rest of the staff grades who work in daycare, we tended to pick up the phone and ask. It's so much easier just to pick up the phone and ask."

"I don't think there's a written down pathway, but what happens is that xx comes to our Thursday morning sit-down ward round, and she will note down any new patients that there are, and any patients where there might be any concerns from a dental point of view, and gets patients into the system that way. And then equally we can pick up the phone and make a referral if we need to."

"We're involved with it in terms of our oncology type patients who might have problems with their teeth, who could then be at risk of infection. And we know how to access it for them to be seen by the dental nurse who comes along."

Some departments routinely offer dental assessment while others, e.g. oncology department, might occasionally delay the dental assessment due to the need for urgent medical care. Some child patients might not be offered dental assessment as this is not monitored or recorded locally or nationally. In some cases, this can cause morbidity.

"Every clinic we do the patients are referred for dental assessment prior to surgery. So all my clinics are preoperative and my three surgical colleagues, there's four of us, so we do a clinic every week, effectively. And all the patients are seen by us and by the nurse practitioners and they are sent on for dental assessment at the same time. So it's a one-stop shop, basically. They get their dental assessments at the same time."

"When new patients are diagnosed, one of the up-front things that should get done is a dental assessment because obviously we're giving kids chemotherapy and you want to deal with any potential sites of infection prior to any of that starting. So going to see the dentist at the time of

presentation is often what happens. There are obviously occasions when children present and the dental side of things may have to take a back seat for a couple of weeks or something until we get the treatment established."

"I'm not saying it's never happened, but I don't know that it is a big problem. I don't think so. But, yeah, I think we probably do need a way of highlighting the dental review. Often, the dentists write in Portal, and they write in the note bit at the side of Portal. I don't know why the dentists work there."

Service provision

In general the paediatric dental service was described as a good service and it was reported that the service offered was timely and patients are accommodated without delay.

"I think things are fairly timely. There have been some staffing issues previously. I think things are a bit more settled now than they were. But, yeah, I think by and large. Certainly if someone needs urgent treatment we get it done on time."

"They seem to get on with it appropriately, and they accept, if they're going to have their heart surgery they need to have their dental work sorted out."

"I think the service is good. I have no problem with the service at all. It's settled in, it seems to work very well. We have to fill out forms, but the nurses do all that, nurse practitioners have tended to do all that and it seems to me to work very straight-forwardly."

At the moment as far as we're concerned we get a very good service.

However, some patient groups e.g. bleeding disorders might have to wait longer for treatment.

"With bleeding disorder patients I think it's probably a bit more difficult because they have to just be on the waiting list like anybody else. And it can be difficult to coordinate it because, maybe a day that's picked by the dental service, we then have a very busy day in day case and we can't really accommodate it. And often the families are a bit difficult as well. So dates that suit us might not suit the families, and then we have to start all over again. I think there are probably more delays in that side of the service."

Gaps and improvements

1. The oncology department in Glasgow reported that the access to the paediatric dental department has been difficult after moving into the new hospital. In one instance, a child patient was not accommodated as expected. It is also not clear if the dental consultants on duty are visiting the daycare unit after the ward roundup. It was suggested that the appointment of facilitator or link person would greatly benefit the service as it would address the communication problem.

"I think it's probably fair to say that when we were in the old hospital with whatever the setup was there, you could have somebody who came to daycare for review who had developed some sort of dental problem that was kind of important they were seen, and the dental department were, very accommodating at seeing patients there and then. It's a bit more difficult to get in touch with them now that we're here. I've certainly found that quite difficult. Where we were before there were a variety of treatment rooms, they were just down the stairs from us, you could nip down and have a quick word with somebody. That doesn't happen here to the same extent. It isn't as easy."

"I don't know if anybody comes from the ward, you'd need to double check in the ward, because I'm generally based in the daycare unit. So what's happened since we've moved over here I'm not exactly sure. You used to be aware that somebody was going to the ward because they would come into daycare as well. I haven't been aware of somebody coming into daycare."

"The other week there was a kid came up who had a particularly sore mouth, and we couldn't get hold of any of the consultants on the day that she came up. And one of the junior dentists came to see her, and arranged for her to come back on the Friday which wasn't the best."

2. Generic treatment plans should be developed for different patient groups so that the patient is treated in timely manner without delay.

"We sometimes waste a lot of time writing letters to each other that's perhaps not the most efficient way. We perhaps need a more streamlined way of us producing a treatment plan that becomes part of the dental record, rather than them having to…. I get a lot of letters from the dentist from clinics asking for a treatment plan, whereas we should probably have a treatment plan or they should be

able to access a suitable treatment plan for them. So I think just having something that is there for all patients that we both understand."

3. Dental guidelines relating to treating children with endocarditits should be considered for update.

"The guidelines are designed because they feel that the risk of anaphylaxis is greater than the risk of endocarditis, whereas I don't think that's true in our patient population. That might be true in the general population but not in our patient population. The risk of endocarditis is fatal. I've never seen a patient die of anaphylaxis but I've seen plenty die of endocarditis. I don't quite get where they got this guideline from.

"I think we need an updated guideline, yes. Somebody needs to look at it and make sure that endocarditis actually isn't increasing, because we certainly seem to see more patients with endocarditis that comes from their mouth than we used to."

9.2 Facilitators: Anesthetists' Interviews

Structured interviews were conducted to investigate the perceptions of a representative sample of anaesthetists who facilitate the service in Glasgow and Edinburgh dental hospitals. Questionnaire is attached in the Appendix 26.

Gaps and improvements

1. It was reported that the cancellation rate for GA for patients who are not under comprehensive care is very high in Glasgow and Edinburgh because child patients admitted for extraction under GA are often unfit for the anaesthetic. Therefore, in order to reduce cancellation on the day of admission it is recommended that dental assessment and pre-GA assessment should be offered on the same day or before the day of admission. Currently pre-GA assessment is undertaken on the day of admission.

"On the day of admission, and that doesn't give adequate time to sort out potential medical problems or potentially psychological or behavioural problems in advance of the day which results in a huge

number, or certainly a greater number, of cancellations on the day, which makes the service inefficient".

"I think the big problem is cancellation on the day. There are more dental patients cancelled on the day than any other group of patients".

"There is high rate of cancellations because they're inappropriately fit for a general anaesthetic on the day of treatment".

"There is a high rate of cancellations because of patients not turning up for surgery. There's a lot of that but also patients unwell, or occasionally because you run out of time".

"The waiting list manager knows that the dental patients are the biggest group of cancellations on the day, but I've no idea what they're doing about it".

2. Parents/carers of child patients undergoing extraction under GA should be made aware of risks of GA.

"The other thing that is a defect noted from the dental quality improvement audit is the lack of information given to patients about anaesthesia. And that's because they don't have time to get given any information because there is no pre GA assessment in advance. So, all patients should be given information prior to general anaesthetic. And there is some, but it's not the type of information that we would give from the medical pre-assessment point of view"

3. It is recommended that children with special needs should be managed on a separate list so that professionals can concentrate on managing this group of children effectively and reduce delays. It is acknowledged that this may have resource implications.

"To have a specific list to manage the children who have particular behavioural and learning difficulties, rather than they get managed in the same way as all the other patients, so they're expected to turn up to a very busy day case ward, very noisy, which a lot of these children don't like. And in an ideal world you'd manage these children separately, you could manage them in a quiet part of the hospital, and they would have adequate workup and preparation. But there's clearly a resource implication. That would be the one thing I would like to change. The list I had at the end of last week, busy list, the ward was absolutely going like a fair with thirty patients going through that day, and then

trying to manage two patients, one who had been properly worked up with challenging behaviour, and then the second one with challenging behaviour. And that was very difficult to manage that within that environment".

"Maybe having more resource to be able to dedicate more time to these children with difficulties, special needs, to try and improve their experience".

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11 Appendices

Appendix 1: Proposed National Referral Protocol

This referral guidance is based on the potential complexity of procedures. However it is recognised that care should be holistic and child-centred, and that even simple procedures can be complex and demanding for children with additional needs, significant anxiety, or medical complications. Ideally children should be able to move freely between care settings and care providers, according to their needs, such that as much high quality care as possible is delivered close to home, with the least disruption to the family unit. The most important factors in determining where care should be delivered are the skills and experience of the relevant local dental team. It is also acknowledged that there is a continuum of care and there may be some overlap between what is provided by each of the teams.

1. Primary Care and Enhanced care

A) General Dental Practice and non-specialists in the Public Dental Service – Dentists in teams, working with hygienist-therapists, hygienists, extended duties dental nurses (EDDNs) and the Childsmile team:

- Routine assessment of healthy co-operative children, including clinical and radiographic examination, assessment of caries risk, preventive advice in accordance with SDCEP guidelines
- Preventive care including topical fluoride, application of fissure sealants, diet analysis and advice, toothbrushing instruction, toothpaste usage instruction/prescription, scaling and prophylaxis
- Detection, diagnosis and clinical staging of dental caries (extent of caries i.e. enamel only or enamel and dentine)
- Behaviour and pain management techniques including use of topical and local anaesthetics for children, and acclimatisation for mild to moderate anxiety
- Restorative care – adhesive (composite/compomer) and amalgam restorations where required (single surface in primary teeth), pre-formed metal crowns (PMC's) for multi-

surface restorations in primary teeth

- Endodontic treatment of closed apex permanent teeth
- Exodontia of primary and permanent teeth, including orthodontic extractions and removal of erupted supernumaries
- Single tooth partial dentures (transitional) and removable space maintainers
- Interceptive orthodontic treatment with a removable appliance
- Emergency treatment and pain management for simple dental trauma and dental infection
- Advice on common soft tissue conditions such as recurrent aphthae and primary herpes
- Advice on early tooth tissue loss
- Provision of any of the above under conscious sedation, where indicated, and where there are appropriate skills and training.
- Timely onward referral to the most appropriate service (PDS or HDS) of children requiring diagnosis or treatment outwith the above scope, and the maintenance of regular review during any periods of shared care

B) Specialist-led services within the Public Dental Service.

- Assessment and management of severe early childhood caries
- Assessment and management of unstable progressive caries in the mixed and permanent dentition where a standard preventive programme in primary care has been unsuccessful
- Management of patients with multiple anterior teeth requiring endodontic treatment including those with incomplete apices or undergoing resorption
- Management and advice on moderate progressive tooth tissue loss including provision of

direct/indirect restorations where required

- Advice and management of common gingival conditions, e.g. gingivitis, epulides and mucocoeles.
- Management of children with additional needs or learning difficulties, Asperger's etc who cannot be accommodated by the general dental teams
- Enhanced behavioural management techniques, provision of inhalation sedation and use of electronic delivery methods for local anaesthesia
- Endodontic treatment of primary teeth
- Vital and non-vital bleaching techniques
- Microabrasion for enamel opacities and hypomineralistion/hypoplasia
- Pre-formed metal crowns on permanent molars
- Surgical interventions such as removal of roots/unerupted teeth and simple soft tissue procedures
- Interceptive orthodontic treatment with removable or sectional fixed appliances
- Assessement and treatment of children with tempero-mandibular joint dysfunction
- Treatment planning for patients requiring extractions under general anaesthesia
- Treatment planning for healthy children for comprehensive care under general anaesthesia
- Timely onward referral to the HDS of children requiring diagnosis or treatment outwith the above scope, and the maintenance of regular review during any periods of shared care

2. Secondary and Tertiary Care- Hospital consultant-led services

- Assessment and treatment of complex dental or cranio-facial conditions requiring a multi-disciplinary input to treatment planning and care provision such as cleft lip and palate, moderate to severe hypodontia cases and children with complex syndromes such as Di George and Treacher- Collins

- Assessment and management of children with significant medical co-morbidity (ASA 2 or more), who require input from other hospital-based teams such as haematology or cardiology in order to meet their dental health needs

- Assessment and management of soft tissue disease/disorders such as granulomas, cysts, intractable oral ulceration etc

- Assessment and monitoring of dental health of hospital in-patients, including the provision of urgent dental treatment prior to significant medical interventions i.e. cardiac surgery, bone marrow ablation, chemotherapy; management of mucositis

- Treatment planning and provision of comprehensive care under general anaesthesia including restorative, endodontic and surgical treatment on patients with co-morbidity, in conjunction with other medical teams

- Provision of restorative care for developmental conditions such as amelogenesis, complex dento-alveolar trauma such as complicated crown fractures, crown/root fractures, intrusion injuries etc, including laboratory-made on-lays, crowns and adhesive bridges

- Endodontic treatment requiring thermoplastic obturation or use of microscopes, placement of MTA (mineral trioxide aggregate), dens in dente teeth.

- Management of abnormalities of tooth eruption sequence or tooth morphology

- Assessment and provision of dental care for neonates

- Treatment of children with significant tongue tie interfering with feeding or speech

- Provision of sedation services, especially intravenous sedation as an alternative to general anaesthetic

All children should be returned to the primary care provider at the completion of episodes of treatment at the earliest opportunity. In cases where long term shared care is required, a clear understanding of each individual service input is essential.

Appendix 2: GDP Survey Questionnaire

1. Please indicate the Health Board you practice in	
☐ Ayrshire and Arran ☐ Borders ☐ Dumfries and Galloway ☐ Fife ☐ Forth Valley ☐ Grampian ☐ Greater Glasgow and Clyde	☐ Highland ☐ Lanarkshire ☐ Lothian ☐ Orkney ☐ Shetland ☐ Tayside ☐ Western Isles
2. What preventive treatments do you routinely provide under NHS regulations for your child patients?	
☐ Dietary advice ☐ Tooth-brushing instruction ☐ Fluoride varnish application ☐ Fissure sealants	
3. What restorative treatment do you routinely provide under NHS regulations for your child patients?	
☐ Amalgam restorations ☐ Composite restorations ☐ Glass ionomer restorations ☐ Stainless steel crowns/Hall technique ☐ Endodontic treatment	

4. Are there any challenges to you providing the following treatments for your child patients? Please tick all boxes that apply.

	SDR fee		Time		Training		Staffing		Patient cooperation	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Preventive advice	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fluoride varnish	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fissure sealants	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Restorations	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Stainless steel crowns	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Endodontic treatment	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Multiple extractions	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other										
Additional comments										

5. Do you know what treatments your local public dental service offers (previously known as the community/salaried dental service)?

☐ Yes ☐ No

6. Have you referred paediatric patients to your local public dental service?

☐ Yes ☐ No

If no, why not? e.g. Paediatric Service does not exist

(if you answered no you will be taken question 10)

7. If yes, how easy do you find it to refer to PDS?

☐ Easy ☐ Neither easy nor difficult ☐ Difficult

8. Please list reasons for referral to PDS

☐ General anaesthesia
☐ Sedation
☐ High caries rate / multiple carious teeth
☐ Degree of dental complexity
☐ Trauma
☐ Surgical care
☐ Degree of medical complexity
☐ Special needs

☐ Poor cooperation
☐ Anxiety
☐ Vulnerable/looked after and accommodated children
☐ Other
Please specify……
……..

9. Have you referred child patients to one of the dental hospitals or institutes?

☐ Yes ☐ No

If you answered no you will be taken question 12.

10. If yes, please list reasons for referral

☐ General anaesthesia ☐ Sedation ☐ High caries rate / multiple carious teeth ☐ Degree of dental complexity ☐ Trauma ☐ Surgical care ☐ Degree of medical complexity ☐ Special needs	☐ Poor cooperation ☐ Anxiety ☐ Vulnerable/looked after and accommodated children ☐ Other Please specify……..

11. What factors influence your decision to refer to a hospital rather than PDS?

☐ Severity of condition
☐ Preference
☐ Hospital proforma dictates referrals accepted
☐ Other
Please specify……..

12. Does your area have referral protocols for children being referred to

	Yes	No	Don't know
PDS	☐	☐	☐
Dental Hospital	☐	☐	☐

13. Would you be willing to participate in a short interview?

☐ Yes ☐ No

Appendix 3: Dental Hygienists and Therapists Survey

The delivery of paediatric dental care by dental hygienists and therapists in the General Dental Service

This survey was instigated to explore the clinical treatment of children by dental hygienists and therapists in the General Dental Service (GDS) in Scotland. It was undertaken in the hope that it could contribute to the collection of baseline data which would inform the future direction of paediatric dental care

1. Introduction

All dental institutions in Scotland have a remit for the education and training of dental hygienist-therapists with 49 students graduating each year. They undertake either a three or four year degree in Oral Health Sciences and are qualified to provide approximately 70% of routine dentistry for both the child and adult population. Consequently, their contribution to primary care dentistry should be significant although there is evidence to suggest that their skills are underused in this setting. The introduction of Direct Access in 2013 by the General Dental Council (GDC) made it possible for hygienists and therapists to work to their full scope of practice without prescription and without the patient having to see a dentist initially. This could make a further positive impact on the prevention and treatment of disease in the child population, should their potential be fully recognised.

2. Methods

During January and February 2016, an online survey was conducted amongst Scotland-based dental hygienists and therapists. An initial pre-notification email determined to establish where each individual was employed, excluding those who worked in the Public Dental Service (PDS) or hospital service, to confine results to the GDS only (see section 4 for the survey questionnaire).

3. Results

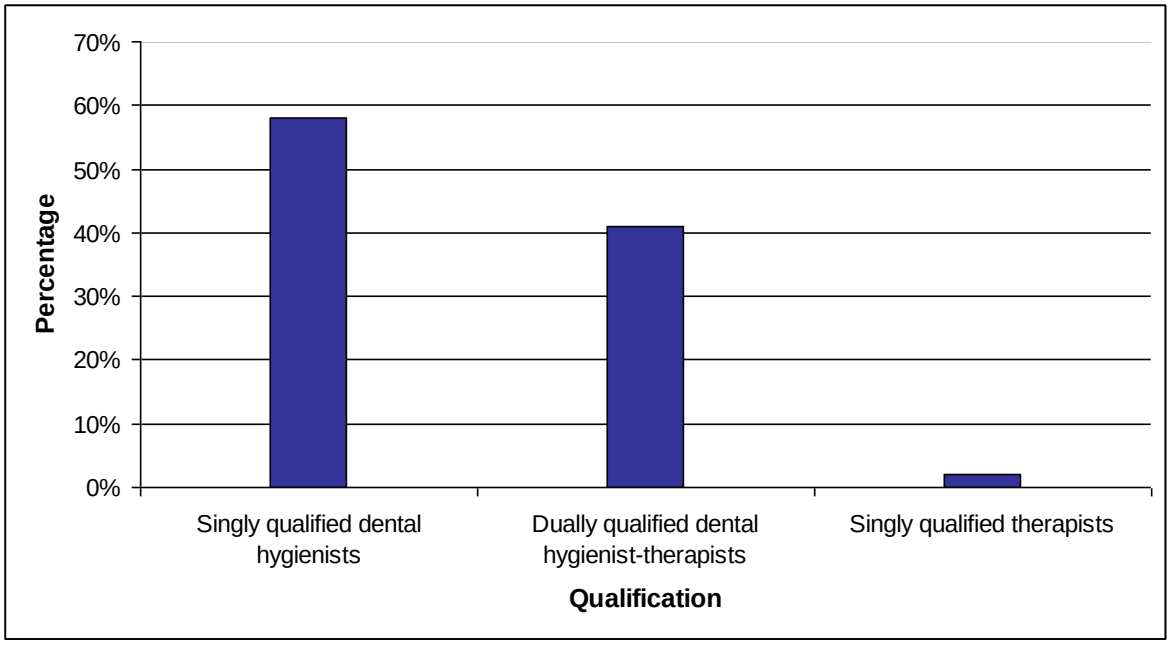
It was estimated that 456 were eligible for the survey, although it is likely that a small number of non-respondents did not work in the GDS. A total of 219 subjects completed the questionnaire, although five of these reported that they did not work in the GDS. The

response of 214 of 451 represents a 47% response rate.

Qualifications

Of the respondents (214), 58% (n=124) were singly qualified dental hygienists, 41% (n=88) were dually qualified dental hygienist-therapists, and 2% (n=4) were singly qualified therapists (see Figure 1).

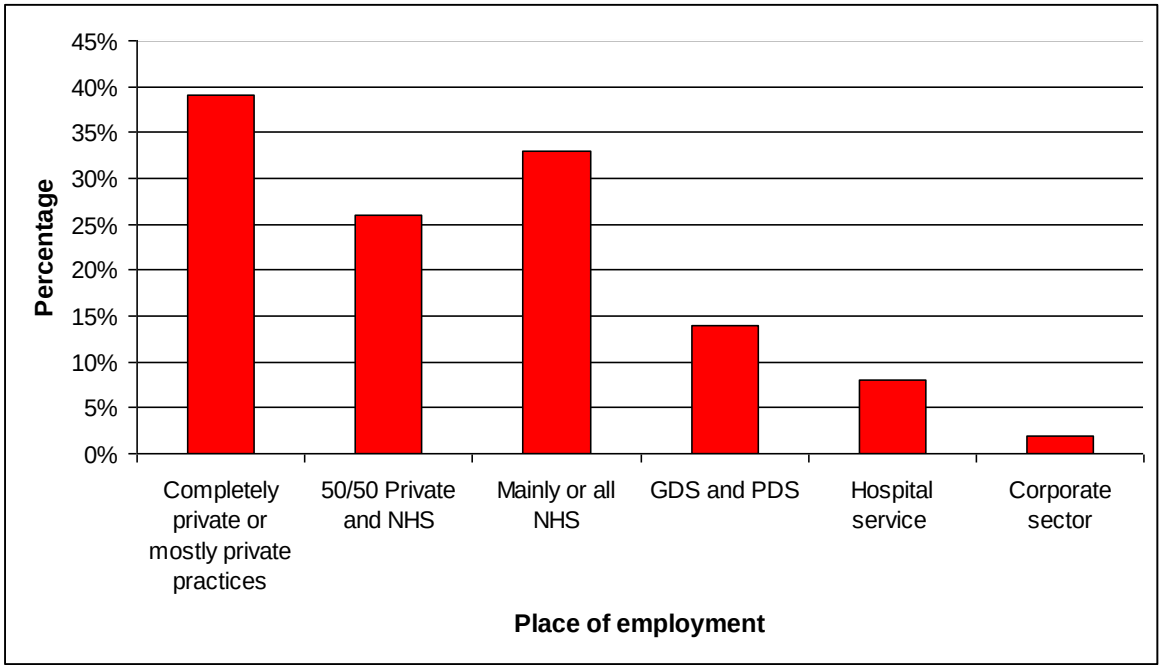
Figure 1: Qualifications of the respondents



Nature of employment

Thirty nine percent of hygienists and therapists stated they worked in completely private or mostly private practices, 26% reported practices were 50/50 private and NHS, 33% were mainly or all NHS, 14% worked in both the GDS and PDS, 8% were employed in the hospital service and 2% in the corporate sector (see Figure 2).

Figure 2: Respondents place of employment



Treatment of Paediatric Patients

The majority (80%) of respondents reported that they treated children in their practice although 36 individuals said they did not. The following are a selection of comments as to why hygienists and therapists did not treat children:

- Children are very rarely referred to me in practice and I never see them in hospitals
- Dentist does not pass patients to me. She “doesn't think therapists are properly trained" and passes a lot to vocational trainee dentist, as doesn't have to pay me.
- Hygienist appointments are private so very rarely see children
- I can only treat children on a private basis, unfortunately. I see, at the very most, four per year.
- I do not get referred them. One practice has a dedicated children's dentist
- I presume it’s due to costs. Seeing children and paying a dental hygienist is not cost effective for dentist. I am so disappointed as trained on prevention of caries and perio disease but now only treat perio problems. Have not seen any children for….
- Never referred
- Not by choice. I work as a private hygienist. Children seen by NHS dentist.
- Not referred any by employers
- Rarely referred them. We have a Childsmile nurse and the dentists do any work needed to be carried out
- They do not generate money for the practice.

Preventive care/restorative treatment

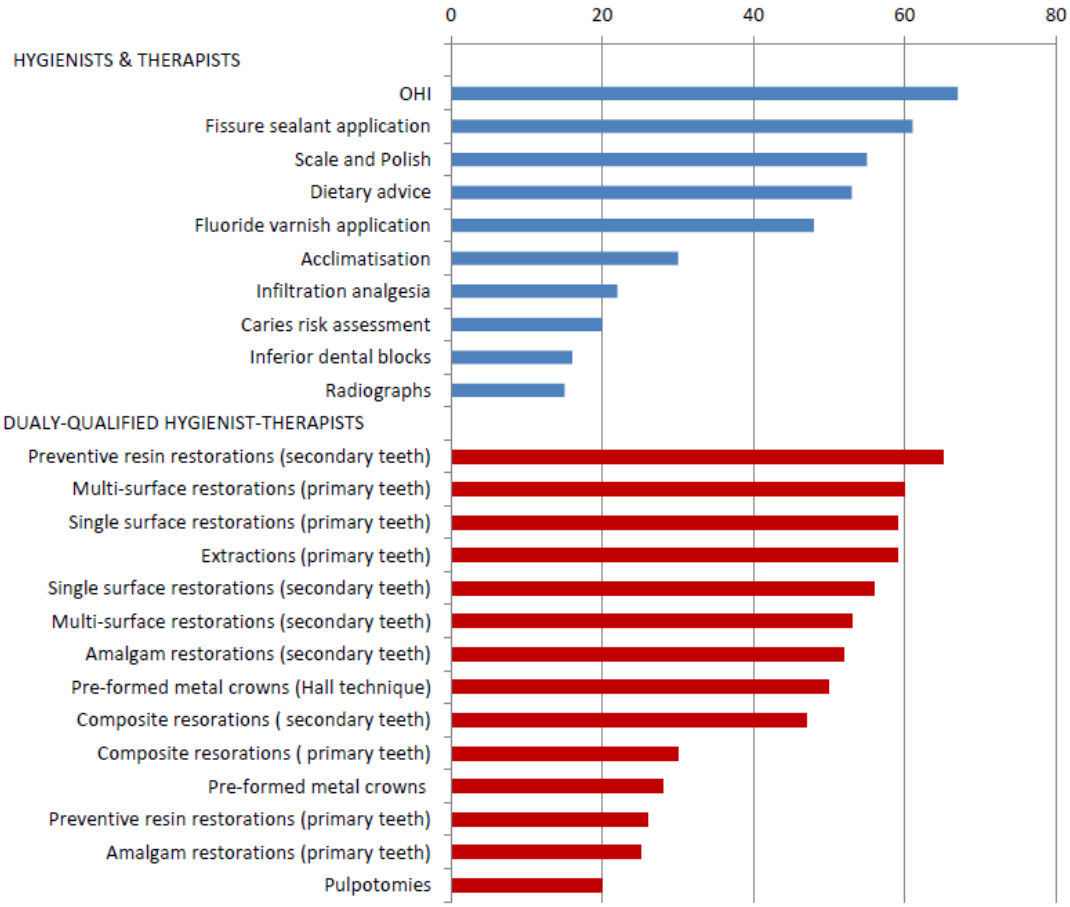
Forty six percent of the respondents reported that a dental hygienist or therapist carried out

the majority of preventive treatments, with the remaining 54% stating these treatments were undertaken by a dentist. With regard to restorative care, 36% reported that this was delivered by a therapist, while 62% stated it was carried out by dentists.

Treatment provided by Hygienists or Therapists

The survey revealed that therapists were carrying out low numbers of composite, amalgam and preventive restorations on primary teeth, pulpotomies, or pre-formed metal crowns (PMC) using the Hall technique. From the open-ended comments received, it was apparent that many of the respondents felt that they were underutilised in that they were not being given the opportunity to work to their full scope of practice. Figure 3 demonstrates the types of treatment provided by singly and dually qualified hygienists or therapists.

Figure 3: Percentage of hygienists and therapists routinely providing certain treatments for child patients (blue bars=all respondents n=219; red bars=dually qualified hygienists and therapists only (n=90))



Referral for Treatment

Of the respondents, 30% said there were procedures which were not referred to them even though they were within their scope of practice. The following are a selection of comments as to why some treatments were not referred to hygienists and therapists:

- Dentist's referral is more targeted at restoring a cavity instead of alternative treatments such as PMC. Dentists unaware of the scope of practice of a therapist
- Not required, normally charted for fillings as too extensive for preventive resin restoration.
- Patient compliance and time restraints
- Probably because it takes time out my book & dentist doesn't get fee for it
- No assistance
- Dentist prefers to do himself
- I don't have a light for curing and my surgery is not laid out in a way that I can do this treatment myself as I work without a nurse.
- Dentist doesn't see the point of restoring primary teeth
- Most parents opt for private composites. All private conservation extraction treatment carried out by dentists.
- Don't think the dentists get a fee for referring children to me so hardly see any now
- Done by dentist
- I see patients on private basis so all NHS work carried out by dentist
- I am very busy and see very few children. The dentists have quieter books so undertake preventive treatment themselves
- In general practice the dentist often state they don't refer these treatments due to financial constraints - due to how their contracts work. Sometimes they say it is to do with control and knowing what the condition of the cavity was prior to filling. Both terrible excuses.
- Money/easy treatment
- The dentists would rather I was doing scalings to make the practice more money.
- Dentists prefer [as initially didn't have a nurse]. Have offered
- The dentist claims acclimatisation in the dentist's surgery
- Childsmile dentist and nurse do this

Barriers to Treatment

A total of 43% declared there were barriers to providing paediatric dental care some of which are detailed below:

- Time e.g. time in practice for acclimatisation. Too much time spent on treating problems rather than prevention

- Time....Within a 15min appt it's difficult to disclose/ scale and polish and do Oral Health Instruction (OHI) in that time.
- Books are full for approx. 3-4 months ahead. Dentists will not refer patients for Childsmile as they would not get any payments if I carried it out.
- The final barrier may be that dentists are concerned about job security since the advent of direct access….
- Commercial viability....no fee given for this...which means OHI has to be given during treatment appointment, and not given separately. If I could have separate appointment I could focus more directly on this subject only
- Cooperation of child is largest barrier. Sometimes not having enough time/visits for acclimatisation can bring on a barrier as it's not cost effective to bring children in for visits when no treatment can be claimed.
- Financial! Children have to pay a private fee to see the hygienist.
- Gaining consent from a parent, some children attend alone.
- GDP principals don't allow it due to loss of cost
- High failed to attend (FTA) rates in NHS practices. Compliance from parents. Dentist's knowledge of hygienist/therapist remit
- In most of my practices time is so booked up with hygiene that it is quicker for the child to be hooked in with the dentist. In one of my practices it's not so much of an issue as there is another hygienist.
- Little time for acclimatisation as I need to meet daily financial targets. Parents often want all treatment carried out in 1-2 visits which can be difficult when child is afraid/uncooperative/ needs a lot of treatment. Parents do not seem to realise
- NHS fees
- NHS list number
- Not being able to prescribe treatment on the NHS e.g. needing an local anaesthetic (LA) prescription or having to go back to the dentist if they have missed something which can mean having to send the patient away of the dentist is not in.
- Parents are often in a rush or frightened of dental treatment and this is relayed to the child.
- Parents aren't keen on a lot of Scottish Dental Clinical Effectiveness Programme (SDCEP) recommended treatments i.e PMCs and amalgam restorations
- Parents need to pay private fee for children to see hygienist.
- Poor referral/inadequately worded, teeth not charted etc. No nurse can be a juggling act making moisture control very difficult.
- Sadly in practice the financial implications of using the hygienist time is more weighted to paying adults. It is more cost effective to treat adults rather than OHI, dietary advice for children. I think the children are missing out. Cost and time are the two main barriers. Also the claiming system in no way recognises any of our work, no codes OHI unless three visits are undertaken, no code for scale and polish for kids. This would make a big difference if the work we do can be claimed for in kids.

- Prescriptions for fluoride toothpaste and varnish as per SDCEP. Time in mixed practice NHS no fee for prevention
- Preventive/ OHI care is difficult to quantify so not always supported by admin managers
- Sadly in practice the financial implications of using the hygienist time is more weighted to paying adults. It is more cost effective to treat adults rather than OHI, dietary advice for children. I think the children are missing out.

Requirement for NHS List Numbers

Thirty percent and 45% of hygienists and therapists respectively felt that having a list number to undertake direct access in the NHS would have a positive effect on the service they were able to provide for children and many others in the population.

4. Questionnaire used for Dental Hygienists and Therapists Survey

A.	**ABOUT YOU**	
1.	Are you qualified as a:	
	☐Dental Hygienist ☐Dually qualified Dental Hygienist-Therapist	☐Singly qualified ☐Dental Therapist ☐Other
1.a	If you selected Other, please specify ……..	
2.	Do you have any additional qualifications? ☐Yes ☐No	
2.a	If you selected Yes, please specify……	
3.	In which year did you qualify?.....	
4.	Which institution did you qualify from?.....	
5.	How many sessions per week do you normally work?.....	
6.	Do you currently work in General Dental Practice (either in private practice or the NHS)? ☐Yes ☐No	
7.	Do you currently work in General Dental Practice (either in private practice or the NHS)? ☐Yes ☐No	
8.	Do you work in	
	☐All Private Practice ☐Mainly Private Practice ☐50/50 Private & NHS Practice	☐Mainly NHS Practice All NHS Practice Public Dental (Community) Service ☐Dental Hospital/School ☐Corporate body/company ☐Other

8.a	If you selected Other, please specify: ……..	
9.	IF YOU WORK IN GENERAL DENTAL PRACTICE: How many practices do you work in? …….	
B.	**TREATMENT YOU PROVIDE FOR CHILDREN**	
10.	Do you currently see child patients? ☐Yes ☐No ☐Other	
10.a	IF NO: Why not?.....	
11.	Who undertakes the majority of preventive care for children in your practice? ☐A hygienist or therapist ☐A dentist ☐Other	
11.a	If you selected Other, please specify:……	
12.	Who undertakes the majority of restorative care for children in your practice? ☐A hygienist or therapist ☐A dentist ☐Other	
12.a	If you selected Other, please specify:……	
13.	Approximately how many children do you see in an average month?.....	
14.	Approximately what percentage of the child patients you see are referred to you for treatment?.....	
15.	Which of these treatments do you routinely provide for your child patients? (select all that apply)	
	☐Caries risk assessment ☐Acclimatisation ☐OHI ☐Scale and polish ☐Fluoride varnish application ☐Fissure sealant application ☐Dietary advice ☐Inferior dental blocks ☐Radiographs ☐Pulpotomies ☐Extraction of primary teeth ☐Infiltration analgesia ☐Pre-formed metal crowns ☐Pre-formed metal crowns using the Hall technique	☐Preventive resin restorations on primary teeth ☐Preventive resin restorations on secondary teeth ☐Single surface restorations on primary teeth ☐Single surface restorations on secondary teeth ☐Multi-surface restorations on primary teeth ☐Multi-surface restorations on secondary teeth ☐Amalgam restorations on primary teeth ☐Amalgam restorations on secondary teeth ☐Composite restorations on primary teeth ☐Composite restorations on secondary teeth
16.	Are you qualified in Inhalation Sedation? ☐Yes ☐No	
16.a	IF YES: Do you undertake Inhalation Sedation for your child patients? ☐Yes ☐No	

17.	Are there any treatments which you are qualified to undertake that you choose not to provide for children? ☐Yes ☐No
17.a	If you selected Yes, please specify:…….
17.a.i	Why do you choose not to provide these treatments? ……..
18.	Are there any treatments for children that are not referred to you to undertake? (i.e. treatments you are qualified to do but are not given to do) ☐Yes ☐No
18.a	If you selected Yes, please specify:……
18.a.i	Why are these treatments not referred to you? ……
19.	When you treat child patients do you have a dental nurse present? ☐ Yes always ☐ Yes usually ☐ Depends on treatment ☐ No ☐Other
19.a	Is a dental nurse present more often when you treat children than when you treat adults ☐ Yes - more often ☐ No - it's the same ☐ No - less often
19.a.i	IF THE NURSE'S PRESENCE DEPENDS ON THE TREATMENT: Please state which treatments: ……
20.	On average, for how long are appointments for your child patients scheduled? ☐ 15 minutes ☐ 30 minutes ☐ Depends on treatment ☐Other
20.a	IF DEPENDS ON TREATMENT OR OTHER: Please specify ……..
21.	Do you find there are any particular barriers in providing oral health care for children? ☐Yes ☐No
21.a	IF YES, please specify……..
C	**TREATMENT YOU PROVIDE FOR CHILDREN**
22.	Do you think that having an NHS List Number would have an effect on the service you are able to provide for children? ☐Yes - a positive effect ☐Yes - a mixed effect ☐Yes - a negative effect ☐No effect ☐Other
22.a	IF YES OR OTHER: In what way? ……
22.b	Do you think that working on a direct patient access basis would have an effect on the service you are able to provide for children?

	☐Yes - a positive effect ☐Yes - a mixed effect ☐Yes - a negative effect ☐No effect ☐Other
22.b.i	IF YES OR OTHER: In what way? ……
23.	Finally, do you prefer to respond to surveys like this online or by post? ☐online ☐by post ☐no preference
	COMMENTS
24.	Please add any further comments you may have on the issues covered in this survey. ……

Appendix 4: Clinical Directors' Survey Questionnaire

Health Board Details	
1. Please indicate your Health Board	
Ayrshire and Arran	Highland
Borders	Lanarkshire
Dumfries and Galloway	Lothian
Fife	Orkney
Forth Valley	Shetland
Grampian	Tayside
Greater Glasgow and Clyde	Western Isles
Paediatric Dental Referral and Treatment Details	
2. Are Children referred to specific clinic/s locations?	
Yes	No
If yes, please specify	
3. If so, how many specific clinic locations?	
1	6
2	7
3	8
4	9
5	10
If more than 10, please specify	
4. Approximately how many paediatric referrals do you receive in a month?	
0-50	250-300
50-100	300-350
100-150	350-400
150-200	400-450
200-250	450-500
If more than 500, please specify	
5. Approximately what percent of referrals do you receive for children compared to all referrals?	
1% - 5%	25% - 30%
5% - 10%	35% - 40%
10% - 15%	40% - 45%
15% - 20%	45% - 50%
20% - 25%	55% - 60%
If more than 60%, please specify	
Workforce Details	
Does your Service have staff specifically responsible for the treatment of children?	
Yes	No
7. If yes, Please indicate the Whole time equivalent (WTE)	
Clinical Director	
Assistant Clinical Director	
Specialist in Paediatric Dentistry	
SDO/Senior salaried GDP	
CDO/Salaried GDP	
Therapist	

Hygienist
8. Please specify the number of staff on the Paediatric specialist list or with an interest or with additional qualifications.
Specialist in Paediatric Dentistry
Additional Postgraduate qualification but not on specialist list
With an interest in Paediatric Dentistry
General Anaesthesia Provision
9. Do you offer "extractions only" under GA?

Yes	No

10. If yes, please specify the location?
District General hospital
Children's hospital
Other (please specify)
11. Do you provide comprehensive care including restorative care under GA?

Yes	No

If yes, please specify
12. If yes, is this a separate list?

Yes	No

If yes, please specify
13. Under which clinician are patients admitted?
Public Dental Service
Oral & Maxillofacial Surgery
Paediatric Dentistry
Medical Paediatrics
Other (please specify)
14. Approximately how many GA referrals do you receive in a month?
0-5
5-10
10-15
15-20
20-25
25-30
30-35
35-40
40-45
45-50
If more than 50, please specify
15. Do you have post GA Follow up e.g. prevention clinics?

Yes	No

If yes, please detail
16. Do you offer an alternative to GA e.g. Inhalation sedation?

Yes	No

If yes, please detail	
Treatment for children who require multidisplinary care	
17. Do you provide dental support and treatment for child patients undergoing tertiary medical treatment in other specialities e.g. Oncology, haematology etc?	
Yes	No
If yes, please detail	
18. Is this medical treatment out with board area e.g. tertiary service for oncology?	
Yes	No
If yes, please detail	
19. Do you provide dental support and treatment for children who have completed their medical treatment?	
Yes	No
20. If yes, do you receive support from Hospital Paediatric dental service?	
Yes	No
If yes, please detail	
21. Do you make out of Health Board area referrals for children requiring dental treatment?	
Yes	No
If yes, please detail approximate numbers/ to where and any comments	
22. Do you have a defined protocol/pathway for multidisciplinary care for children?	
Yes	No
If yes, please detail	
Help with SDNAP report	
23. Would you be willing to help us by allowing us to carry out patient interviews in one of your clinics?	
Yes	No
Other, please specify	
24. Would you be willing to help us with data collection for the SDNAP report?	
Yes	No
25. If yes, please select all that apply	
Referral audit	
GA audit	
Additional Information or comments	

Appendix 5: Referral rate for GA provision and provision of alternate to GA

Health Board	Approximately how many GA referrals do you receive in a month?	If more than 50, please specify	Do you have post GA Follow up e.g. prevention clinics?	If yes, please detail	Do you offer an alternative to GA e.g. Inhalation sedation?	If yes, please detail
Lothian	45-50		Yes		Yes	all patients offered IHS if appropriate and IV sedation in Edinburgh if 12 years and over
Greater Glasgow and Clyde	416		No		Yes	IHS at multiple sites
Shetland	0-5		Yes	Our GA patients are all registered with our PDS, so routine care is routinely provided afterwards. There is not GDS in Shetland currently.	Yes	IHS
Grampian	125 referrals are then pre assessed depending on treatment need and anxiety		No		Yes	Al patients pre assessed and decision made as to which mode of anxiety management required
Forth Valley	35-40		No		Yes	
Borders	15-20	this is variable and are generally referred for GA or anxiety management	Yes	we have input from our oral health support workers and every child referred for GA for pain, sepsis, caries management generates a Childsmile referral to a OHSW	Yes	iv (anaesthetic led) is also offered for older children
Ayrshire and Arran		70-80 per month	Yes	Oral Health Promotion at assessment & follow up	Yes	RA if appropriate at 4 sites
Orkney	0-5		Yes		Yes	Inhalation sedation at one clinic
Highland	10-15		No		Yes	
Tayside	35-40		Yes	Involved in RECUR research programme	Yes	Behaviour management and sedation as required
Lanarkshire		about 100 per month	No		Yes	
Western Isles	0-5		Yes		Yes	
Fife		We receive more than 50 for assessment ,no one can request GA ,we receive circa 70	No		Yes	IV and HIS
Dumfries and Galloway	05-10		No	Variable care pathways - can include special care programme, therapy school, outreach	Yes	Gaseous sedation, and IV in adolescents

Appendix 6: Provision of comprehensive care including restorative care under GA

					Under which clinician are patients admitted?				
Health Board	**Do you provide comprehensive care including restorative care under GA?**	**Other (please specify)**	**If yes, is this a separate list?**	**Other (please specify)**	**Public Dental Service**	**Oral & Maxillofacial Surgery**	**Paediatric Dentistry**	Medical Paediatrics	Other (please specify)
Lothian	Yes		No			Yes		Yes	
Greater Glasgow and Clyde	No	delivered by secondary care staff	Yes				Yes		
Shetland	Yes		No		Yes				
Grampian	yes		yes			yes			
Forth Valley	Yes		No		Yes				
Borders	Yes	basic Restorative care, generally only in permanent dentition, no advanced care such as endodontics/ crown and bridge	No	lists are protected GA day case paediatric dental	Yes				
Ayrshire and Arran	Yes		Yes	For Special Needs pts including children		Yes			
Orkney	Yes		No		Yes	Yes			
Highland	Yes		Yes		Yes				
Tayside	Yes	For appropriate patients - not routine	No		Yes				
Lanarkshire	Yes	Only for special care patients	Yes		Yes				
Western Isles	Yes		No		Yes				
Fife	Yes		Yes		Yes				
Dumfries and Galloway		Only for special needs patients	Yes		Yes				

Appendix 7: Extraction only GA provision by NHS Board

		If yes, please specify the location		
Health Board	**Do you offer "extractions only" under GA?**	**District General hospital**	**Children's hospital**	**Other (please specify)**
Lothian	Yes			St.Johns Hospital
Greater Glasgow and Clyde	Yes	Yes	Yes	
Shetland	Yes	Yes		
Grampian	3 sessions/week		Yes	
Forth Valley	No			
Borders	No	Yes		
Ayrshire and Arran	Yes	Yes		
Orkney	Yes	Yes		
Highland	Yes	Yes		
Tayside	Yes	Yes		Two hospitals
Lanarkshire	Yes	Yes		
Western Isles	Yes	Yes		
Fife	Yes			special unit in grounds of DGH
Dumfries and Galloway	Yes	Yes		Two sites

Appendix 8: Treatment for children who require multidisciplinary care

Health Board	**Do you provide dental support and treatment for child patients undergoing tertiary medical treatment in other specialities e.g. Oncology, haematology etc?**	**If yes, please detail**	**Is this medical treatment out with board area e.g. tertiary service for oncology?**	**If yes, please detail**	**Do you provide dental support and treatment for children who have completed their medical treatment?**	**If yes, do you receive support from Hospital Paediatric dental service?**	**If yes, please detail**
Lothian	No	EDI	No	EDI	No	No	
Greater Glasgow and Clyde	Yes	RHC	Yes	West of Scotland	Yes	Yes	Cleft services, Cardiac services
Shetland	No	Because tertiary level paeds is not available in our Health Board	Yes		Yes	Yes	If needed
Grampian	Yes	Referral to PDS as and when required	No			no	
Forth Valley	Yes		No		Yes	Yes	
Borders	No	rarely approached to do so	Yes		Yes	Yes	Our special care PDS senior works within district general hospital
Ayrshire and Arran	Yes	ad hoc	No		No	No	
Orkney	Yes		Yes	Always off island	Yes	Yes	Very rare we have cases but when we do the clinician coordinates treatment with the treating hospital, if that

							hospital has a paediatric dental service then they will guide us on the care
Highland	Yes	poorly developed	Yes		Yes		on a temporary basis through a visiting consultant until July 2014.
Tayside	Yes	Oncology clinic support	No		Yes	No	
Lanarkshire	Yes	Small numbers only	Yes	Usually in Glasgow	Yes	Yes	For small numbers of patients
Western Isles	No		Yes		Yes	Yes	
Fife	Yes	specialist paedodontist sees	Yes	in Lothian or Dundee	Yes	No	
Dumfries and Galloway	Yes	occasional, via, consultant paediatricians	No		Yes	No	

Appendix 9: Out of Health board referrals by NHS Board

Health Board	Do you make out of Health Board area referrals for children requiring dental treatment?	If yes, please detail approximate numbers/ to where and any comments	Do you have a defined protocol/pathway for multidisciplinary care for children?	If yes, please detail
Lothian	No		No	
Greater Glasgow and Clyde	No		No	
Shetland	Yes	For multi-disciplinary max fax and multi-disciplinary ortho cases/patients, they are referred to Grampian	No	
Grampian	Yes	1 or 2 per year	no	
Forth Valley	Yes	varies but about cases per month	Yes	
Borders	Yes	very occasionally when a specialist opinion or treatment is appropriate	No	
Ayrshire and Arran	No		No	
Orkney	Yes	In our Grampian Network of Consultants and we have some visiting consultants. Any referrals further a field are usually tertiary	No	
Highland	Yes	<5 to Dundee/Glasgow/Edinburgh	No	
Tayside	Yes	Very occasionally, if a child needs to attend a specialist paediatric hospital. Less than once a year, to Yorkhill or Sick Children's Hospital	No	
Lanarkshire	Yes	Children under 3 yrs of age are referred to Yorkhill Hospital for dental extractions under GA	No	
Western Isles	Yes		No	
Fife	Yes	rare only if out with anaesthetic guidelines for a DGH	Yes	referred child who dnas
Dumfries and Galloway	Yes	Occasional, via Yorkhill	No	

Appendix 10: PDS Referral Audit Form

Referral Letter Information

Patient details

Date of Birth ☐ Date ☐

Patient Post Code ☐☐

Referred by ☐ GDP ☐ GMP ☐ Consultant Specialty (specify)……
☐ Other (specify)……..

Does this patient have a history of?
(Please tick all that apply)

☐ Severe early childhood caries or unstable/extensive caries in the mixed/permanent dentition
☐ Abnormalities of tooth morphology, number, and structure;
☐ Advanced restorative care including laboratory-made restorations
☐ Complex endodontic therapies including management of non- vital immature teeth or teeth undergoing internal or external resorption
☐ Direct/indirect composite restorations for teeth with extensive tooth tissue loss or enamel/dentine defects
☐ Surgical interventions outwith the competence of the primary practitioner
☐ Treatment planning for children requiring extractions under general anaesthesia and sedation
☐ Treatment planning and provision of comprehensive dental care under general anaesthesia
☐ Severe tooth tissue loss
☐ Disturbances of tooth eruption
☐ Periodontal or soft tissue conditions/lesions
☐ Anxiety/Phobia
☐ Child protection issues
☐ Complex dento-alveolar trauma
☐ Non-vital or vital bleaching techniques
☐ Interceptive orthodontic treatment
☐ Multi-disciplinary care
☐ Other (specify)…….
☐ Reason not specified

Reason for Referral (Please tick one box)

☐ Advice Only ☐ Treatment Only ☐ Advice and Treatment
☐ Second Opinion ☐ Other (specify) ……
☐ Reason not specified

Was a treatment area clearly specified by the referrer ☐ Yes ☐ No

If yes, please specify……..

Referral Triage Result

☐ Referred to the Hospital Service ☐ Accepted to be assessed for GA/sedation
☐ Accepted to see a PDS specialist ☐ Sent back to GDP to re-refer to GA service
☐ Accepted to see PDS dentist ☐ Sent back to GDS to re-refer with further information

Appendix 11: Other categories

Other	Number referrals received
Registration request	9
Abscess, cyst	2
ADHD, no coop treatment	2
Autism	7
GDP not confident in treating Paediatric patients with early caries	1
Large number of teeth to be extracted and patients age	2
Medical conditions	4
not under GA	1
Orthodontic extractions	5
Pain	1
Poor Oral hygiene	1
Pulpotomy/hall crown	1
RA for Fissure Sealants	1
simple dental trauma, early caries	2
Special needs	6
Total	45

Appendix 12: Referrals received for anxiety/phobia

PDS Clinic	Number of referrals for Anxiety/Phobia	Total number of referrals	Percentage
Borders	6	15	40%
Fife	93	115	80.9%
FRI	26	66	39.4%
Highland	32	53	60.4%
RAH	14	33	42.4%
Tayside	45	69	65.2%
Total	216	351	61.5%

Appendix 13: Referrals received for treatment planning for children requiring extractions under GA/sedation

PDS Clinic	Number of referrals for Treatment planning for children requiring extractions under General Anaesthesia/Sedation	Total number of referrals	Percentage
Borders	10	15	66.7%
Fife	76	115	66.1%
FRI	32	66	48.5%
Highland	34	53	64.2%
RAH	5	33	15.2%
Tayside	28	69	40.6%
Total	185	351	52.7%

Appendix 14: Referrals received for severe early childhood caries

PDS Clinic	Number of referrals received for severe early childhood caries	Total number of referrals	Percentage
Borders	10	15	66.7%
Fife	49	115	42.6%
FRI	26	66	39.4%
Highland	20	53	37.7%
RAH	22	33	66.7%
Tayside	21	69	30.4%
Total	148	351	42.2%

Appendix 15: Cross tabulation SIMD 2012 quintile and three most prevalent conditions in the PDS

SIMD 2012 quintile	Anxiety/Phobia	Treatment planning for children requiring extractions under general anaesthesia	Severe early childhood caries or unstable/extensive caries in the mixed/permanent dentition
	Count	Count	Count
1	55	43	42
2	50	43	39
3	39	41	22
4	39	34	24
5	15	13	11
Total	198	174	138

Note: Postcode could not be matched/not reported for 23 referrals

Appendix 16: Referral Triage Result

PDS Clinic	*NR	Accepted to be assessed for GA/Sedation	Accepted to see a PDS dentist	Accepted to see a PDS specialist	Referred to the Hospital Service	Sent back to GDS to re-refer to GA service	Sent back to GDS to re-refer with further information	Total
Borders	1	9	3	0	2	0	0	15
Fife	0	95	7	13	0	0	0	115
FRI	0	19	33	11	0	1	2	66
Highland	0	36	17	0	0	0	0	53
RAH	4	10	15	4	0	0	0	33
Tayside	2	35	7	25	0	0	0	69
Total	7	204	82	53	2	1	2	351

*NR: Not Reported

Appendix 17: Hospital Audit Form

Referral Letter Information

Patient details

Date of Birth ☐ Date ☐

Patient Post Code ☐☐

Referred by ☐ GDP ☐ GMP ☐ CSDS ☐ Consultant Specialty (specify)……

☐ Other (specify)……..

Does this patient have a history of?

☐ Severe early childhood caries or unstable/extensive caries in the mixed/permanent dentition

☐ Abnormalities of tooth morphology, number, and structure;

☐ Advanced restorative/endodontic care including laboratory-made restorations

☐ Complex endodontic therapies including management of non- vital immature teeth or teeth undergoing internal or external resorption

☐ Direct/indirect composite restorations for teeth with extensive tooth tissue loss or enamel/dentine defects

☐ Surgical interventions outwith the competence of the primary practitioner

☐ Treatment planning for children requiring extractions under general anaesthesia

☐ Treatment planning and provision of comprehensive dental care under general anaesthesia

☐ Severe tooth tissue loss

☐ Disturbances of tooth eruption

☐ Periodontal or soft tissue conditions/lesions

☐ Anxiety/Phobia

☐ Child protection issues

☐ Other (specify)…….

☐ Complex dento-alveolar trauma

☐ Non-vital or vital bleaching techniques

☐ Interceptive orthodontic treatment

☐ Multi-disciplinary care

Reason for Referral (Please tick one box)

☐ Advice Only ☐ Treatment Only ☐ Advice and Treatment

☐ Second Opinion ☐ Other (specify) ……

Was a treatment area clearly specified by the referrer ☐ Yes ☐ No

If yes, please specify……..

Referral Triage Result

☐ Accepted to see a Consultant ☐ Accepted to be treated under GA

☐ Sent to CDS ☐ Sent back to GDS

Appendix 18: Referrals received by GDH

Health Board	Number of Referrals Received	Percentage
Greater Glasgow & Clyde	316	71.8
Lanarkshire	39	8.9
Highland	7	1.6
Ayrshire & Arran	4	.9
Forth Valley	4	.9
Fife	1	.2
*NR	69	15.7
Total	440	100.0

*NR postcode not reported

Appendix 19: Referrals received by EDI

Health Board	Number of Referrals Received	Percentage
Lothian	282	89.5
Borders	7	2.2
Fife	7	2.2
Forth Valley	2	.6
Dumfries & Galloway	1	.3
*NR	16	5.1
Total	315	100.0

*NR postcode not reported

Appendix 20: Referrals received by DDH

Health Board	Number of Referrals Received	Percentage
Tayside	121	91.7
Fife	11	8.3
Total	132	100.0

Appendix 21: Patient Questionnaire - PDS

1. What kind of treatment is your child undergoing and for what condition?
2. What are the reasons for this treatment?
3. Who referred your child to this service?
4. Were you and your child actively involved in deciding the appropriate dental treatment (were your opinions asked and was it valued)
5. Did you provide written consent for undergoing IV, GA or other intervention?
6. Do you feel you or your child was given adequate information about the treatment options e.g. leaflet?
7. Did you understand the options given to you?
8. Were you or your child made aware of any risks?
9. Does/Do the staff make you and your child feel safe, comfortable and supported?
10. Do you know who to ask for help if you have any questions? Are the staff approachable and knowledgeable?
11. From being referred, how long did you and your child have to wait before starting treatment?
12. What do you or your child think the benefits of the treatment are/will be?
    - Pain relief
    - Improvement in health of your teeth and gums.
    - Appearance: Feeling better about the way you look and feel
    - Self esteem: Feeling more confident
13. What is your/your child's view about the staff providing the treatment
14. Has your child ever felt discriminated due to race, distance from home, disability etc?
15. If your child received treatment was this successful (was there improvement)
16. How would you rate the quality of the service your child received? If no please expand
17. Is there anything else you or your child would like to comment on?

Appendix 22: Patient Questionnaire - Hospital

1. What kind of treatment is your child undergoing? Type
2. What are reasons for this treatment?
3. Who referred your child to this service?
4. Was yours or your child's consent obtained?
5. Were you or your child informed about different treatment options?
6. Were you or your child made aware of any risks?
7. How long did your child wait to start treatment?
8. How long has your child been under treatment? Duration
9. How were your child's appointments? Did it affect your child's school attendance?
10. Was your child's treatment painful?
11. What do you or your child think the benefits of the treatment are/will be?

- Appearance: Feeling better about the way you look and feel
- Self esteem: Feeling more confident
- Improvement in health of your teeth and gums.

12. What is your child's view about the staff providing the treatment
13. Has your child ever felt discriminated due to race, distance from home, disability etc?
14. Did the consultant consider your child's opinions while planning your treatment?
15. If your child received operative treatment was this successful (was there improvement)
16. How would you rate the quality of the service your child received?

Appendix 23: Topic guide for Semi-Structured Interview: Public Dental Service Providers

1. Which group of patients are accepted for treatment in PDS?
2. What are the most common treatment conditions that you are likely to treat?
3. Approximately how many referrals do you receive each month? Of these, what % of these are advice and how many for treatment? (Specific service providers only)

4. Approximately how many inappropriate referrals do you receive each month?
    - Inappropriate for public dental service
    - Inadequate information
5. Do you see demand changing for specialists in paediatric service in the community/primary care setting?
6. Is a there a demand for specific treatment/s in the public dental service setting.
7. What is the level of complexity of these treatments and why?
8. In the last one month how many patients did you treat? How many of them required public dental service.
9. Are there any conditions which seem to be increasing in the referral base?
10. What are your views about the present workforce available for Public dental service?
11. Is your workload increasing/changing? If so, why?
12. Are there any gaps in the service? (IV sedation)
13. What arrangements are in place for children who are moving into adulthood?
14. How do you manage children who are in transitional stage?
15. How do you think the public dental service can be improved?

Appendix 24: Topic Guide for Semi-Structured Interview: Consultants

16. How long is your waiting time for a consultant opinion/patient assessment?
17. How long is the wait for treatment when a plan has been devised?
18. If the waiting time varies dependent upon treatment type or method of delivery or by grade of staff providing treatment, please provide further information.
19. Approximately how many inappropriate referrals do you receive each month?
    - Inappropriate for hospital treatment
    - Inadequate information
20. Do you see change in the volume of demand for specialist paediatric Hospital setting?
21. Is a there a demand for specific treatment/s in the Hospital settings.
22. Are you treating patients within the hospital consultant service that could be better served in a local PDS based specialist service were this to be available, or if already available with a greater capacity?
23. What treatments/conditions/circumstances do you consider appropriate for hospital based treatment, community based treatment and GDP?
24. In the last one month how many patients did you treat? How many/percentage of them required hospital paediatric service.
25. Are there any conditions which seem to be changing in prevalence in the referral base?

26. What are your views about the present workforce available for hospital paediatric service?
27. Is your workload changing? If so, why?
28. Are there any gaps in the service
29. Are there any developments required?
30. How do you think the hospital paediatric service can be improved?
31. Do you have autonomy to decide how and where your patients are treated and the overall service priorities?
32. Have you/your group been invited to provide input into national manpower planning
33. Are you required to meet 18WRTT or 9 Wk assessment to Treatment?
34. What impact has your health board's requirement to meet 18WRTT had on GA services for children
35. If you have GA service which is consultant led, is there also a specialist led GA service via PDS?

Appendix 25: Hospital Service Stakeholders Interview Questionnaire

1. How often do you use paediatric dental service?
2. Why do you use the service?
3. How important is this service to you and why?
4. How do you communicate with this service?
5. Do you receive the required treatment on time or is there a waiting list?
6. If there are delays what problems does this cause?
7. What are your views about the workforce available for this service?
8. What are the gaps in the service? Are there patients of yours who can't be accommodated?
9. How do you think this service can be improved?

Appendix 26: Facilitators: Anaesthetists' Interview Questionnaire

1. How often do you provide service for this service?
2. Are there problems specific to supporting paediatric dental service ?
3. How do you think this service can be improved?

12 Abbreviations

ADH	Aberdeen Dental Hospital
ADHD	Attention Deficit Hyperactivity Disorder
ASD	Autistic Spectrum Disorder
BME communities	Black and Minority Ethnic communities
BSPD	British Society of Paediatric Dentistry
CDS	Community Dental Service
CHSP	Child Health Systems Programme
DCP	Dental Care Professional
DDH	Dundee Dental Hospital
DHSW	Dental Health Support Workers
DOH	Department of Health
EDDN	Extended Duties Dental Nurses
EDI	Edinburgh Dental Institute
EYC	Early Years Collaborative
FTA	Failed to attend
ft/d_3mft x 100	Proportion of obvious decay experience that has been treated restoratively; expressed as number of filled teeth divided by number of obviously decayed, missing and filled teeth, multiplied by 100
GA	General Anaesthetic
GDH	Glasgow Dental Hospital
GDP	General Dental Pracitioner
GDS	General Dental Services
GG&C	Greater Glasgow and Clyde
GIRFEC	Getting it right for every child
GP17	Form used for recording primary care dentistry
GMP	General Medical Practitioner
HDS	Hospital Dental Service
HNA	Health Needs Assessment
ICD	International Classification of Diseases
IHS	Inhalation sedation
IoS	Item of Service
ISD	Information Services Division
IV Sedation	Intravenous sedation
LA	Local anaesthetic
LAAC	Look after and accommodated children
MCN	Managed Clinical Network
MIDAS	Management Information & Dental Accounting System
MIH	Molar Incisor Hypomineralisation
NDIP	National Dental Inspection Programme
NoS	North of Scotland
NR	Not Reported
NRS	National Records Scotland
OHI	Oral Health Instruction
ONS	Office for National Statistics
PDS	Public Dental Service
PMC	Preformed Metal Crowns
CCST	Certificate of Completion of Specialist Training
RAH	Royal Alexandra Hospital
RTT	Referral to Treatment
SCIM10	Scottish Caries Inequality Metric
SDCEP	Scottish Dental Clinical Effectiveness Programme
SDNAP	Scottish Dental Needs Assessment Programme

SDO	Senior Dental Officer
SDR	Statement of Dental Remuneration
SHBDEP	Scottish Health Boards' Dental Epidemiological Programme
SHO	Senior House Officer
SIMD	Scottish Index of Multiple Deprivation
SMR01 data	Scottish Morbidity Record- General Acute Inpatient and Day Case data
SNS	Support Needs System
StRs	Specialty Registrars
WHO	World Health Organisation
WTE	Whole Time Equivalent

13 Glossary of terms

Care Index [(ft/d3mft)x100].: Proportion of obvious decay experience that has been treated restoratively; expressed as number of filled teeth divided by number of obviously decayed, missing and filled teeth, multiplied by 100.

Childsmile: National oral health improvement programme for children in Scotland.

Deciduous teeth: Another term for primary teeth or “baby” teeth.

Dental Caries: Medical term for decay, caused by decalcification of the enamel and disintegration of the dentin by acid producing bacteria.

Dental Care Professionals (DCP): This term refers to the wider dental team and is made up of dental hygienists, therapists, nurses, orthodontic therapists, technicians and clinical dental technicians.

Dental sealants/ Fissure sealants: Placing sealants involves the application of a clear resin over the biting surfaces of teeth to prevent decay and to protect the teeth especially in children.

Dental trauma: Tooth loss or damage caused by physical injury.

Dentine: The main constituent of the teeth, it is bone like, contains no cells, and is covered by enamel.

Dentist with Special Interest (DwSI): Dentists in primary care who have obtained experience and qualifications in an area of their interest, but have not trained to the standard and qualification of a specialist and can therefore not join the specialist lists.

DMFT/dmft : An indication of the level of decay measured by counting the decayed, missing or filled teeth (dmft). DMFT refers to the decay in the secondary dentition (adult teeth), dmft refers to the levels of decay in the primary dentition. The subscript 3 indicates decay into dentine (advanced decay).

d/dmf: Proportion of obvious decay experience that has not been treated restoratively.

Enamel: The hard, white shiny surface of the crown; composed of 95% calcium hydroxyapatite.

Erosion: Chemical dissolution of teeth.

Fluoride: A chemical compound that helps to prevent dental caries.

Fluoride varnish: Topical application of a fluoride gel or liquid that prevents decay.

General anaesthesia (GA): Is a state of controlled unconsciousness. During a general anaesthetic, medications are used to send you to sleep, so you're unaware of surgery and don't move or feel pain while it's carried out.

Hypodontia: The condition in which the patient has missing teeth as a result of the failure of those teeth to develop (also called tooth agenesis). Hypodontia describes a situation where the patient is missing up to five permanent teeth, excluding the third molars.

Inhalation sedation (IHS): is a light form of sedation. It is a mixture of nitrous oxide and oxygen breathed through a nosepiece. This helps the child to feel relaxed and accept treatment. Inhalation sedation is also known as 'happy air'.

IV sedation: is when a sedative is injected directly into a vein. If you are nervous about having dental treatment or you are having a procedure which may cause discomfort,

intravenous (IV) sedation is an effective and safe treatment.

Molar tooth: A tooth having a broad biting surface adapted for grinding, being one of twelve in humans, with three on each side of the upper and lower jaws.

Molar Incisor Hypomineralisation (MIH): is a common developmental condition resulting in enamel defects in first permanent molars and permanent incisors.

Maxillo-facial surgery: Surgical specialty concerned with the diagnosis and treatment of diseases affecting the mouth, jaws, face and neck

Occlusion: The relationship of the teeth in a closed position in both the maxillary and mandibular arch

Oral cancer: Malignant tumour of the mouth

SHANARRI Wheel: The acronym SHANARRI is formed from the eight indicators of wellbeing: Safe, Healthy, Achieving, Nurtured, Active, Respected, Responsible, and Included. All of these wellbeing indicators are necessary for a child or young person to reach their potential. They are used to record observations, events and concerns and as an aid to creating an individual plan for a child.

Water fluoridation: Addition of fluoride to a population's drinking water to reduce tooth decay.