Guidelines relevant to paediatric dentistry – do foundation dentists and general dental practitioners follow them? Part 1: diagnosis and prevention

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Key points

Encourages readers to follow guidelines in general dental practice to improve children's oral health.

Encourages readers to improve record keeping.

Suggests practitioners revisit the guidelines relevant to paediatric dentistry.

Introduction Dental caries can have a detrimental effect on the quality of life of children, affecting eating preferences, quantity of food eaten and sleeping habits. Careful assessment, prevention and management of dental caries are required to minimise these consequences and to foster positive attitudes towards dentistry. **Aim** To determine whether foundation dentists, their educational supervisors and other general dental practitioners follow guidelines of relevance to paediatric dentistry. **Method** A retrospective review of dental records for 661 patients, with an age range from one to 15 years old. **Results** Caries risk was recorded for less than half of patients. Bitewings had never been taken for more than two thirds of 4–15-year-old children. More than a quarter of patients had no record of fluoride being offered. **Discussion** The manuscript discusses guidelines relevant to paediatric dentistry and a retrospective record review suggests diagnosis and prevention guidelines are not always followed in general dental practice.

Introduction

Dental caries can have a detrimental effect on the quality of life of children, affecting eating preferences, quantity of food eaten and sleeping habits.¹ Sepsis, pain and suffering are potential consequences of untreated dental caries in children. Careful assessment, prevention and management of dental caries are required to minimise these consequences and to foster positive attitudes towards dentistry.²

Current guidelines relevant to paediatric dentistry that assist clinicians in the UK include those published by:

Refereed Paper. Accepted 19 December 2017 DOI: 10.1038/sj.bdj.2018.350

- Department of Health (DOH)³
- Scottish Dental Clinical Effectiveness Programme (SDCEP)⁴
- National Institute for Health and Clinical Excellence (NICE)⁵
- British Society of Paediatric Dentistry (BSPD)⁶
- Faculty of General Dental Practitioners (FGDP)⁷
- Scottish Intercollegiate Guidelines Network (SIGN) 138.⁸

Caries risk assessment and diagnosis

All children are at risk of developing dental caries and a caries risk assessment should be carried out and recorded as part of a comprehensive oral health and dental examination to identify the level of risk to appropriately deliver prevention and manage dental caries.^{34,7} Some children are at an increased risk. A child appears to be most at risk of caries if he or she acquires oral mutans streptococci at a young age.⁸ Previous caries experience and living in an area of deprivation are evidence-based indicators of children at increased risk of developing

caries.^{8–10} Other potential risk factors for dental caries in children include oral hygiene, diet, factors relating to breast and bottle feeding, fluoride exposure, and parental smoking.¹¹

It has been advised that these and other factors including caries incidence in siblings, tooth brushing and dietary habits form the basis of the clinician's risk assessment, and that this is used to decide on the frequency of radiographs, provision of preventive interventions and frequency of recall.⁴

Bitewing radiographs are required for accurate caries diagnosis in children, as proximal lesions can be missed using clinical examination alone.¹² Taking intra-oral radiographs can be challenging in young children, and they should be taken if clinically indicated and cooperation would allow a diagnostically acceptable image to diagnose. The FGDP recommends taking bitewing radiographs 6-12 monthly for children at an increased risk, and for all other children 12-18 monthly for primary teeth and every 24 months for permanent teeth,¹³ however, routine radiographs based solely on time elapsed since last examination is not widely supported.

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Prevention

Caries prevention is multi-factorial and several interventions are recommended, including diet advice, tooth brushing advice, provision of fluoride and application of fissure sealants.

Diet advice should be routinely given to patients to promote good oral but also general health, and the SCDEP guidelines advise clinicians to give dietary advice at least annually.3,4

Tooth brushing advice should also be provided at least annually, with instruction to brush at least twice daily and use of the correct amount of toothpaste with age-appropriate fluoride.^{3,4} For children under eight years, until the child has adequate understanding and manual dexterity,3 guidelines recommend that the parent or carer supervises tooth brushing.

There is strong evidence that fluoride has dental benefits, and regular provision of fluoride varnish is effective in preventing dental caries.14 Recommendations are that sodium fluoride varnish (5%) should be applied twice per year for all children, and 3-4 times for those children who are at high caries risk.^{3,4}

The use of fissure sealants as a preventative measure to reduce dental caries has a significant evidence base with studies reporting significant reduction in caries in permanent molars compared with unsealed teeth.15 Guidelines recommend placing resin-based fissure sealants in pits and fissures of teeth, to check them for wear at every recall visit and to 'top up' if they are worn and there is still an

increased caries risk status. SIGN 138 guidelines recommend all permanent molars to be fissure sealed within two years of eruption irrespective of the child's caries risk assessment,⁴ and DOH guidelines recommend permanent molars to be fissure sealed for those giving concern to their dentist.3

Education for practitioners

The academic references and clinical guidelines form the backbone of the theory for the dental undergraduate curriculum and its practical application in paediatric dentistry. Once a dentist is qualified and registered with the General Dental Council (GDC), they can practise dentistry privately on patients without supervision. If a practitioner wishes to work in general dental practice on the National Health Service (NHS), they need to complete a further period of training, usually one year, as a foundation dentist. During this year, they have an educational supervisor (ES) with them in practice, and a programme of education, including study days structured on a curriculum.16 Once satisfactory completion is achieved, the dentist is able to practise dentistry on the NHS in the general dental service (GDS). The ESs are appointed through a competitive process in which the practice and the ES is assessed. All dental practitioners in the UK are expected to meet the standards set by the GDC17 including continual professional development requirements. A GDC registrant that has had their clinical care called into question may be asked to defend why there has been deviation away from recognised guidelines, yet here is some evidence that guidelines

for taking bitewings and fluoride application are not always followed.^{18,19} Furthermore, in a study of dentists in Wales, a low number reported that they 'always' comply with FGDP (UK) selection criteria for dental radiography, yet most were familiar with them.²⁰

The purpose of this study was to ascertain whether the learning and skills in paediatric dentistry engrained at undergraduate level and embedded within guidelines translates into practical application within general dental practice by FDs, ESs and associates within approved training practices.

Methods

Thirteen FDs based in the south west of England were recruited to take part in the retrospective record review. ESs and associates within the FDs' practices were also asked to participate. Only those practitioners that agreed to participate were included. An excel data capture sheet was constructed to collect data anonymously, confidentially and comprehensively for patients aged 15 and under. Data collection for the record review was conducted by the FDs. Each FD collected data from their own patients and their participating colleagues' with distinction being made between patients that had been treated by an FD, by an associate and by the FDs' ESs. They assessed the records of patients that attended the practice within a four-week period. A maximum of 30 patient records were assessed per practitioner. Each record was assessed retrospectively, looking at the status of the dentition during the last full course of treatment (regardless of whether it was a band 1, 2 or 3 NHS course of treatment or private treatment, but not including any visit on the day of the record review). Data captured included the patient's age, the date of the most recent radiographs, the recording of caries risk, diet advice, oral hygiene instruction, whether fluoride varnish was offered, recall interval advised and whether a referral was made. The status of each of the primary molars at the start of the course of treatment was also recorded, including the tooth type, presence/absence of the tooth and presence/absence of a cavity. Also, the number of fully erupted, unrestored and unsealed first permanent molars were recorded as well as the number that were fissure sealed.

The data capture sheets were then collected by a training programme director in the south west and the results were pooled and analysed using excel. Fig. 3 Recorded caries risk for patients of each type of dentist





Fig. 4 No provision of a specific item, or no evidence recorded

Results

Data for 661 patients, with an age range from one to 15 years old was captured (Fig. 1). A total of 340 patients were FD patients, 231 were ES patients and 90 were patients of an associate (Fig. 2).

More than half of patients did not have their caries risk recorded (344/661 – Fig. 3). No dental radiographs had been exposed for any of the 37 children under the age of four. For patients aged four and over, 69% (435/624) had never had bitewing radiographs. There was no record of fluoride being offered for 26% of patients (169/661), diet advice also was not recorded in 26% (175/661) of patients, and oral hygiene advice was recorded for nearly all patients (97%, 641/661) (Fig. 4). A total of 352 patients had at least one first permanent molar that was unrestored and remained unsealed. Of those 352 patients, 1205 first permanent molars were present in the oral cavity, unrestored and unsealed. Twenty-six patients with at least one first permanent molar that was unrestored and remained unsealed were recorded as high risk, with a total of 70 first permanent molars unsealed.

Seventy-one patients were recorded as being at high risk of caries. Of those high-risk patients, 30 (42%) had never had bitewing radiographs (Fig. 5).

A total of 141 of the 661 patients presented with one or more cavity in their primary molars (for their dental status see Fig. 6). Only 41 (29%) of those patients were recorded as being at high risk of caries. Seventy-five (53%)

Fig. 5 Venn diagram showing the overlap of the number of patients that were high risk, never had radiographs, and patients with a cavity present



had no record of caries risk, 15 (11%) were recorded as low risk and ten (7%) as medium risk. Eighty-nine (63%) of the patients with cavities had never had bitewings, 21 (15%) had no record of being offered fluoride, 37 (26%) had no record of diet advice and 14 (10%) had no record of OHI. Fifty (35%) of the 141 patients with cavities in primary teeth had first permanent molars that were left unsealed, with the number of unsealed first permanent molar teeth being 148.

When comparing FDs, ESs and associates, differences are evident. FDs and ESs recorded

caries risk more frequently (51% and 49% respectively) than associates (33%). ESs and associates were more likely than FDs to have patients where bitewing radiographs had never been taken (78%, 76% and 65% respectively). FDs were less likely than ESs and associates to have patients with no record of fluoride being offered (14%, 41% and 31% respectively). FDs were also less likely to have patients with unsealed first permanent molars (45% for FDs, 62% for ESs and 61% for associates). For those patients recorded as high risk (Fig. 7), ESs were more likely than FDs to have patients

that had never had bitewings (61% and 36% respectively). For patients with cavities, FDs were more likely than ESs to record a high-risk category for caries (38% and 20%), record that fluoride, diet advice and OHI had been offered, and to have patients with all first permanent molars sealed (28% and 54%).

Discussion

The findings of this retrospective record review seem to indicate that guidelines for caries prevention and radiographic review are not always followed by some practitioners. The frequency of recorded diagnostics and prevention provided to patients under the age of 16 are reported. Results illustrate that dentists may not be aware of guidelines, how to assess caries risk and what preventative measures should be implemented, including for high caries risk children. These findings are of interest and may indicate a learning need for dentists. Despite 21% of children in this study having a cavity in a primary tooth, 69% of all children aged four and over had never had bitewing radiographs. Furthermore, 63% of patients with cavities had never had bitewings. Without radiographs, a proper assessment of caries risk becomes much more difficult. More than half of the patients in the study did not have a record of their caries risk. The use of caries risk assessments has been shown to improve documentation and compliance with preventive plans.²¹ For those patients that did have caries risk recorded,





42% of those that were at high risk of caries had never had bitewings. Patient cooperation can be poor when taking intraoral radiographs, which may go some way to explaining the low number.

Preventive advice (diet) and prevention (fluoride, fissure sealants) were not documented in a number of cases. This may be due to poor record keeping, or because it was not conducted. Guidelines support fluoride and fissure sealant application, and it is encouraging that recent NHS statistics show increased reporting of fluoride use for child patients, up 20% in a year from the 20142015 figure, and an 11% increase for fissure sealant use.22 In this study, 15% of children with cavities had no record that fluoride had been offered. A large proportion of children in this study had molars left unsealed, including high risk patients. This represents missed opportunities to provide prevention, and may place children at a greater risk of caries than would be the case if the preventive measures were implemented. No regular bitewings may result in a lack of caries diagnosis, or delayed caries diagnosis, with obvious clinical implications.

Differences between FDs and ESs exist. FDs were more likely to have patients where bitewings were taken, fluoride was recorded as being offered and fissure sealants were applied. This suggests that newly qualified dentists may be more likely to adhere to guidelines, perhaps because their education was more recent. This is encouraging, however, there is still plenty of room for improvement to achieve recommendations in the guidelines. The results here suggest similar conclusions as the self-reporting studies of GDPs in Wales and Scotland, that they do not always follow guidelines.^{18,20} An alternative explanation could be that there was a lack of good record keeping.

Record keeping should be of paramount importance to practitioners. Defence societies advocate comprehensive, contemporaneous and complete dental records. Some studies have shown that deficiencies exist in general dental practitioner records,^{23,24} and this study too demonstrates deficiencies. Caries risk is not recorded for all children. A large proportion of those recorded as high risk had never had bitewings. This may be due to a lack of consent or cooperation, which should always be noted in the patient records. Furthermore, there were far more patients that presented with cavities than the number of patients that were recorded as being high risk. Of those patients with cavities, many had never had bitewings, and some had no record that fluoride was offered.

A large disparity between guidelines and practice is evident in the results of this study. It may be a disappointment to teaching establishments to see that recent graduates do not seem to be following their undergraduate teaching despite having the necessary tools to do so. It may also be of concern that general dental practitioners are not following guidelines. Commissioners may be disappointed when considering value for money. However, it should also be remembered that primary

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care general dental practitioners manage the vast majority of the child population that visit a dentist, and there is a general improvement in children's oral health.^{25,26} This study focuses on whether guidelines are followed, not on the patients dental practice journey or outcome for patients once under the management of a GDP, such as patient satisfaction, pain, sepsis and new carious lesions. We are in a time when news headlines read 'four in ten children not going to the dentist', with these headlines based on NHS statistics.27 It will be beneficial to conduct further general practice-based research based upon patient satisfaction and outcomes, especially in light of recent evidence from primary dental care that questions the clinical and economic benefit of fluoride application,²⁸ even though Cochrane reviews support fluoride14 and multifactorial population studies show an improvement in dental health with an intervention programme.29 What can be said is that encouragement to diagnose, prevent, treat and record in line with current guidance, whatever that may be, will help defence organisations prolong a successful career for general dental practitioners, young and old. More importantly, it will help to prevent undue suffering of children from dental disease.

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