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Action plan The findings of this study have led to changes in the referral criteria to the UG and DTS treatment clinics. This audit will be repeated in the near future to determine whether the change in referral criteria has made any difference to the proportion of children successfully completing their course of treatment under local anaesthetic.

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Provision of dental care for paediatric oncology patients at Brimingham Children's Hospital ALISON HUTTON¹, VICTORIA CLARK¹.

MARTIN ENGLISH² & SARAH MCKAIG¹

¹Department of Paediatric Dentistry, Birmingham Children's Hospital, Birmingham, UK, and ²Department of Paediatric Oncology, Birmingham Children's Hospital, Birmingham, UK alison.hutton@googlemail.com

Introduction Childhood cancer is fortunately rare with the UK incidence rates being in the range of 110–150 per million children per year. One in 500 children will be affected during the first 15 years of life¹. There has been a large reduction in mortality due to early diagnosis and improved treatment regimes. By the year 2000, one in 900 adults aged 16–34 were survivors of childhood cancer².

In 2005, The National Institute for Health and Clinical Excellence published a document; Guidance on Cancer Services *Improving outcomes in children and young people with Cancer*³. This evidence-based document acknowledged that cancer treatment can result in acute oral problems such as mucositis and other viral, bacterial and fungal oral infections. Later in life, previous cancer treatment can cause structural anomalies of the developing dentition. The document identified that oncology patients often have inadequate dental input during their illness and are later often lost to dental follow up³.

Further publications from The United Kingdom Children's Cancer Study Group (UKCCSG) and the Paediatric Oncology Nurses Forum (PONF)⁴ included evidence based guidelines about mouth care for children and young people with cancer. The audit was carried out to investigate the current provision of oral health care for these individuals further.

Aims (i) To establish how much need there is for specialist paediatric dental input for paediatric oncology patients at Birmingham Children's Hospital; and (ii) to aid in the planning of future service provision at Birmingham Children's Hospital.

Objectives (i) To determine the number of patients currently regularly attending a dentist; (ii) discover when their last visit to the dentist was; (iii) establish if oral health screening was undertaken before chemotherapy treatment commenced; (iv) ascertain if patients have received specialist paediatric dental input; (v) investigate the barriers to dental care subsequent to a cancer diagnosis; and (vi) explore whether information on the effects of cancer therapy to the oral cavity is provided for the families of individuals requiring cancer therapy.

Standards The recommendations made by NICE 2005 and UKCCSG-PONF 2007 were taken as the gold standard^{3,4}:

(i) All patients are screened at the time of cancer diagnosis by a dentist and any required oral health treatment is carried out before commencing cancer therapy. This would be ideally by a dentist linked to the cancer centre; any treatment required should be undertaken by a consultant or specialist paediatric dentist; (ii) information on the effects of cancer therapy on the oral cavity should be given to all cancer patients and their families; (iii) during medical treatment a dental assessment should occur every 3-4 months by a dentist linked to the cancer centre but the patient should also retain registration and communication with the usual dental provider. Any treatment required should be undertaken ideally by a dentist linked to the cancer centre. If this is not available, then oral health treatment by the usual dental provider should occur with clear communication and guidance from the cancer centre; (iv) a named professional should be identified to coordinate care throughout cancer therapy and during the transition to adult services; and (v) there should be clear protocols and referral routes for dental care.

Methods Data were collected in the form of a questionnaire (available at: http://www.bspd.co.uk) from the parents/guardians of children attending the oncology clinic. Following piloting, the questionnaire was distributed to all parents/guardians of children already attending the oncology out-patient department.

Results Fifty-six questionnaires were completed by parents/guardians of children aged 0-16 years over a 4 month period. Of these 80% (45) had acute lymphoblastic leukaemia, 5% (3) chronic myeloid leukaemia and the remaining 15% (8) a mix of other cancer types. The majority of patients 89% (50) were receiving chemotherapy, 9% (5) other chemotherapy and radiation therapy and 2% (1) were being observed. Ninety-one per cent (51) of patient's parents/guardians reported their child to be registered with a general dentist with 86% (48) having attended for an oral examination in the last 12 months. Only 9% (5) reported to have specifically visited a dentist for an oral examination before starting cancer therapy. Twenty-seven per cent (15) were referred by the oncologist during cancer therapy to the dental specialities department for further dental treatment due to specific oral health problems. Four per cent (2) of general dentists were reported to have said they were uncomfortable treating the child due to the medical diagnosis. Thirty-six per cent (20) of families were unsure of the general dentists thoughts and 59% (33) said the general dentist was still happy to see their child. Fifty-two per cent (29) would prefer dental care to occur locally and 25% (14) preferred the hospital with the remainder showing no preference. Eighty-nine per cent (50) had received information regarding care of their child's mouth during cancer therapy and 66% (37) said the effects of the medical treatment on the child's mouth and teeth had been discussed.

Discussion Regular access to general dental services did not meet the gold standard as 9% (5) of patients reported not to have a dentist and only 86% (48) were examined by a dentist in the preceding 12 months. Children were not routinely screened for oral disease or potential causes of infection on the diagnosis of cancer. Only a small number received specific specialist paediatric dental care. These were patients referred during cancer therapy by the oncologist when they were having problems and were often then seen as an emergency. Regular oral assessment by a dentist during cancer therapy did not occur. The families were reasonably well informed regarding oral health care during cancer therapy and the effects cancer therapy may have on their mouth and teeth.

At the present time it was recognized that, unfortunately, not all the gold standard recommendations as created by UKCCSG-PONF⁴ could be met within the dental specialities department at Birmingham Children's Hospital due to lack of funding and limited staffing levels.

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Action plan There should be clear protocols and referral routes for follow-up at Birmingham Dental Hospital for oral health care provision on the diagnosis of cancer.

A dental care pathway will be formulated including: (i) children are seen by a dentist before commencing caner therapy to screen for dental disease; (ii) if the child is registered by a primary care dentist this can be done locally. It has been suggested an information leaflet be created for the patients to give to the primary care dentist concerned explaining the need for dental input; (iii) for those patients with no access to a primary care dentist a specific referral form has been designed to refer the patient to the dental specialities department at Birmingham Children's Hospital; and (iv) dental therapy should be in an ordered and planned fashion allowing the child to be dentally fit before commencing cancer therapy therefore reducing the risk of dental infection during this difficult time. Further audit is recommended at Birmingham Children's Hospital once the recent changes to the primary care dental services have

been fully implemented. References

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An audit on the presence of a final working length recording for patients undergoing apexification REBECCA JOHN, DEBORAH FRANKLIN & PETER CRAWFORD

Department of Paediatric Dentistry, Bristol Dental Hospital, Bristol, UK

rebeccakjohn@hotmail.com

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Introduction Apexification is defined as a method to induce a calcified barrier in a root with an open apex or continued apical development of an incomplete root in teeth with necrotic pulp¹. Calcium hydroxide is commonly used for this procedure.

Calcium hydroxide is an irritant if it extrudes beyond the canal. If the material is short within the canal the barrier can form in an undesired location. The location of the calcified barrier is determined by the level at which calcium hydroxide meets vital tissue capable of hard tissue formation. To avoid a hard tissue barrier forming inside the canal the operator should ensure that the entire length of the root canal is filled with calcium hydroxide.

We encountered a small number of patients in the trauma clinic with calcium hydroxide dressings in the canal that were 'less than ideal' which may have affected the outcome of treatment. The majority of these patients had calcium hydroxide placed in the canal without a radiographic working length being established. In teeth with incomplete root formation with a wide open apex, granulation tissue can grow into the root canal especially if there is insufficient calcium hydroxide in the canal. Therefore a periapical radiograph to determine working length is necessary at the start of treatment.

Aim The aim of this audit was to ensure that all patients undergoing apexification in the Department have a final working length recorded by the end of the second treatment appointment for apexification.

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Standards

Criteria	Target	Exceptions	Source of evidence
Patients undergoing endodontic treatment in the Department of Paediatric Dentistry should have an established a working length prior to instrumentation	100%	Nil	Mackie <i>et al.</i> ² (3) Strength B

Methods Data were collected retrospectively by the audit lead from case notes of patients who had non-vital permanent incisors with open apices. The patients were undergoing apexification in the Department of Paediatric Dentistry. Data were collected for the first 50 cases treated from January 2004 on a dedicated proforma (hppt://http://www.bspd.co.uk). The staff involved in treating these patients included senior house officers, postgraduate students, specialist registrars, lecturers and consultants.

Results Of the 50 patients included in the study, six did not have a working length established radiographically by the end of the second appointment. Of the six patients who did not have a radiographic working length, four were treated by a postgraduate student and the other two by specialist registrar or lecturer.

Discussion As mentioned earlier, it is essential that a final working length be established prior to instrumentation. The literature shows that the remnants of the Hertwig epithelial root sheath (HERS), under favourable conditions organize the apical mesodermal tissue into root components. Over-instrumentation can disrupt the HERS and affect barrier formation. Overfilling or under filling of the canal with calcium hydroxide can cause irritation or barrier formation in an undesirable location. Hence the importance of a definite working length cannot be over-emphasized. The current audit highlighted that the standard had not been achieved.

Action plan A flow chart outlining the steps involved in the process of apexification has been placed on clinic to ensure that all staff are reminded to obtain a final working length prior to instrumentation. Re-audit carried out after 1 year showed a marked improvement in compliance. Only one patient of 50 did not have a radiographic working length prior to instrumentation.

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Continuing health care in patients treated for childhood malignancies

REBECCA JOHN¹, JONATHAN PENNY², ANTHONY BROOKS¹, DEBORAH FRANKLIN¹ & MICHAEL STEVENS³ ¹Department of Paediatric Dentistry, Bristol Dental School, Bristol, UK, ²Audit Facilitator, Bristol Children's Hospital, Bristol, UK, and ³Department of Paediatric Oncology, Bristol Children's Hospital, Bristol, UK

rebeccakjohn@hotmail.com

Introduction The oral cavity is a site where complications frequently develop as a direct result of the malignancy or as an unwanted effect of treatment¹. In the United Kingdom there are approximately 1200 new cases of childhood cancer each year. Up to 90% of the paediatric oncology patients may suffer oral

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