

# Oral Care Protocol for Paediatric Oncology Patients

Department of Paediatric Dentistry, Women's and Children's Hospital, North Adelaide, South Australia

## *Part 2: The provision of dental treatment in children undergoing oncology therapy*

### **Authors**

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**Dr Gabrielle Allen**

BDS, BSciDent (Hons), FRACDS

**A/Prof Sam Gue**

BDS, MDSc, FRACDS, FRACDS (Paed), FICD

**A/Prof Tom Revesz**

MBBS, MD, PhD, FRACP

**Professor Richard Logan**

BDS, MDS FFOP (RCPA), PhD

**Professor Dorothy Keefe**

MBBS, MD, FRACP, FRCP

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### **Introduction**

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Despite being reported as rare; 1 in 500 children in the western world are diagnosed with cancer before the age of 15 years (Fadda et al 2006). In addition to an increase in the incidence of cancer among children, recent times have also seen an increase in dental caries. Current data on the incidence of dental caries in Australia indicates that approximately 48% of 5 year olds have dental caries and the majority of these children have untreated dental caries. Dental caries remains prevalent as children transition into the permanent dentition with 34% of 12 year olds having at least one permanent tooth affected by dental caries (Armfield et al 2009; Mejia et al 2012). Therefore, at the time of diagnosis it is quite likely that a child has experienced dental caries and may have untreated dental caries.

As explained in part 1 of this series, it is recommended that all patients diagnosed with cancer are assessed by a specialist oral health practitioner in a timely manner to avoid complications that may arise from untreated dental disease. Many children at the time of diagnosis will require definitive dental treatment to ensure that they are fit to receive myelosuppressive cancer therapy.

The potential effects of oral complications on the patient's overall health and prognosis are significant. In all cases where dental treatment is required, comprehensive multidisciplinary planning and management must be arranged. When possible all urgent dental treatment should be completed prior to the implementation of immunosuppressive treatment (AAPD 2013). Decisions regarding the management of any active disease are made in consultation with the oncology team and based on the risks of oral infection and or complications during the cancer treatment phase.

### **Provision of Dental Treatment**

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When active dental disease is identified in a newly diagnosed oncology patient it is crucial that the dental disease is managed either prior to the commencement of high dose chemotherapy, or as soon as practical, taking into consideration the patients oncology treatment plan. In cases where management of active dental disease cannot be completed prior to the initiation of high intensity chemotherapy, careful multidisciplinary management between the dental and oncology teams is required to ensure that the dental treatment is completed when the patient is haematological stable and any risks of

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infection as a result of the active dental disease are eliminated (AAPD 2013; NCI 2013; Little et al 2008). Timing of dental treatment is based on the oncology management plan, haematological status, as well as the urgency of dental treatment and the intrinsic risk of infection as a result of the active disease.

### ***Haematological Guidelines for Providing Dental Treatment***

Table 2 below has been developed in collaboration between the dental and oncology teams at the Women’s and Children’s Hospital, and has been based and modified from information taken from several sources (AAPD 2013; Hong & daFonseca 2008; Little et al 2008; NCI 2013). Any invasive dental treatment should be co-ordinated with the oncology team.

***Table 2: Haematological Recommendations for Planning Dental Treatment***

<b>Haematological Consideration</b>				
<b>Absolute neutrophil count</b>	>2000/mm <sup>3</sup> No need for antibiotic prophylaxis	1000-2000/mm <sup>3</sup> Clinical judgement based on the patients’ health status and planned procedures, confirm with oncology team but usually no indication for antibiotic prophylaxis	500-1000/mm <sup>3</sup> Clinical judgement based on the patients’ health status and planned procedures, confirm with oncology team, antibiotic prophylaxis and post operative coverage for high risk procedures to be considered	<500-mm <sup>3</sup> Defer dental treatment, if dental treatment is unavoidable, discuss antibiotic prophylaxis and antibiotic coverage with the oncology team; admission may be required
<b>Platelet count</b>	>75,000/mm <sup>3</sup> No additional support needed	50,000-75,000mm <sup>3</sup> Confirm with oncology +/- anaesthetic teams, dental treatment should be possible with local measures such as sutures and utilisation of haemostatic agents, gelatine foams and pressure packs.	25,000-50,000mm <sup>3</sup> Discuss with oncology +/- anaesthetic teams, dental treatment should be possible, platelet transfusion may need to be co-ordinated, local measures and tranexamic acid can be utilised in addition to help control bleeding; admission may be required	<25,000mm <sup>3</sup> Defer non-acute dental care, if it’s an emergency contact the oncology +/- anaesthetic teams to co ordinate platelet transfusions and hospital care as needed. Local measures and tranexamic acid can be utilised in addition to help control bleeding; admission may be required

### ***Guideline for the treatment planning and management of dental disease in oncology patient***

#### ***Restoration of Dental Caries in Primary Teeth***

All caries in primary teeth should be restored prior to the commencement of oncology therapy where possible. Restorative treatment plans vary between cases however, it is crucial to be definitive in treatment planning.

In carious primary molars the use of stainless steel crowns is extensively supported in the literature due to their high success rate, excellent longevity and reduced levels of secondary caries. Both the UK

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National Clinical Guidelines in Paediatric Dentistry (Kindelan et al 2008) and AAPD Guideline (2012) support the use of stainless steel crowns in primary teeth stating that "all papers have concluded that the failure rate of SSC used in primary molar teeth is very low compared with plastic restorations" (Kindelan et al 2008).

Where caries is less extensive in a primary molar and a small occlusal or buccal cavity or very small proximal box restoration is required, a posterior composite resin can be considered (AAPD 2012). The placement of amalgam in primary teeth is usually not recommended due to environmental considerations (NHMRC 1999). However, in institutions where placement of dental amalgam in primary teeth is still practiced, it can be a suitable material for smaller occlusal, proximal or buccal cavities in primary teeth (AAPD 2012).

Composite resins are reported to be the ideal material for small labial restorations on primary anterior teeth (Lee 2002; AAPD 2012). Proximal caries in primary anterior teeth of small to moderate size can also be restored with composite resin (Lee 2002). Primary anterior teeth with significant decalcification or moderate to large carious lesions, full coverage restorations such as composite resin strip crowns are preferred. Extraction may also be seen as the most appropriate and definitive option in young children with extensive anterior caries and limited co-operative ability. This approach also reduces the risk of future infections.

### *Restoration of Dental Caries in Permanent Teeth*

All caries in the permanent dentition should be restored prior to the initiation of oncology therapy where possible. There are a number of factors that influence the choice of restorative material for the young permanent tooth such as larger pulp chambers and decreased restoration survival in young permanent teeth (Vidnes-Kopperud et al., 2009).

Composite resin is the most commonly used material in restorations of young permanent teeth (Hicks et al 2003). It is more aesthetic with quite good wear properties, adhesion to tooth structure and command set when compared to GIC (Tran and Messer 2003). Composite resin is also advocated by some to be effective in class II situations. However, these situations need to be carefully selected to ensure that they are not in heavy occlusal load. A major weakness of the use of composite resin restorations is the longevity in high caries risk patients. The median longevity of composite resin restorations is reported to be 5 years for high compared to 7 years for low to moderate caries risk individuals (Sunnegardh-Gronberg et al 2009). The intensity of the oncology and anticipated late effects that may affect longer term caries risk needs to be factored into the decision of restorative material.

For permanent posterior teeth with a large occlusal lesion or proximal caries, amalgam is recommended due to durability and strength. Gruythuysen et al 1996 demonstrated survival rates of 82% at 15 years for amalgam proximal restorations placed in paediatric patients. Where the lesion is quite extensive stainless steel crowns can be considered for permanent teeth.

Placement of fissure sealants in patients deemed to be high caries risk due to past caries experience and or where the fissures are particularly retentive is recommended. It has been shown in a systematic review by Ahovou-Salaranta and colleagues (2004) found that there was a reduction in caries rate of 87% at 12 months in those first permanent molars that were fissure sealed. This reduction in caries was maintained to a level of 60% at 48-54 months.

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## *Pulp therapy in Primary Teeth*

To date there are no studies that adequately assess the safety of pulp therapy in primary teeth prior to the initiation of chemotherapy and radiotherapy in children. Most clinicians are more comfortable with the definitive option of extraction due to the fact that infections during periods of immunosuppression can become life threatening (AAPD 2013). The AAPD (2013) advocates that teeth that have previously been successfully treated with pulpal therapy can be left and monitored periodically. Extraction of all primary teeth which have any pulpal involvement and the careful clinical and radiographic assessment of teeth which have undergone previous pulp therapy is recommended. In cases where there is doubt regarding the previous pulp therapy, extraction is recommended.

## *Endodontic Treatment*

Endodontic treatment in permanent teeth needs careful consideration. It is recommended that endodontic treatment is commenced and a long term endodontic dressing is completed either prior to oncology therapy or at an appropriate time. In cases where endodontic treatment is deemed to have poor prognosis or the tooth does not need to be maintained, extraction should be completed prior to the commencement of oncology treatment or at an appropriate time. It is also recommended that the aetiology of periapical lesions is differentiated between pulpal infections, inflammatory reactions, apical scars, cysts and malignancy (AAPD 2013).

## *Orthodontic Appliances Including Space Maintainers*

All orthodontic appliances should be removed in patients planned for or having active oncology therapy. This should be completed prior to the commencement of active oncology treatment or at an appropriate time. The exception to this is patients who have appliances such as removable appliances, retainers, fixed lower arches and simple band and loop devices where the patient has excellent oral hygiene.

## *Extractions*

All non-restorable teeth, retained roots, pulpally involved primary teeth, periodontically compromised and symptomatic impacted teeth should be extracted prior to the initiation of oncology therapy. Where possible 7-10 days healing time is recommended following extraction prior to the start of therapy (AAPD 2013). Where this is not possible prior to the initiation of therapy, extractions should be scheduled between periods of immunosuppression to allow for appropriate healing prior to the initiation of the next cycle of therapy. Routine extraction of all mobile deciduous teeth is not necessary. However, where dental treatment is being carried out under general anaesthetic mobile teeth are extracted. Symptomatic mobile teeth are extracted at an appropriate time as needed.

As explained by the AAPD (2013) the decision to extract partially erupted third molars is practitioner dependent. Prophylactic extraction of partially erupted third molars is not recommended. An exception to this recommendation would be in the case of head and neck irradiation that will have an impact on the oral cavity. In this case it is necessary to ensure that all oral surgery procedures [ie. extraction of partially erupted and potentially problematic third molars] are completed before the initiation of treatment involving head and neck irradiation or bisphosphonates in an attempt to reduce the risk of osteoradiorecrosis of the jaws and bisphosphonate associated osteonecrosis of the jaws (ORN, BONJ) (Dodson 2009; Saad et al 2012). There is a lack of consensus regarding the use of antibiotic prophylaxis. This decision should be made based on the haematological status. If the tooth is known to have an infection, the area should be swabbed and an appropriate antibiotic as selected from the culture sensitivity be prescribed (AAPD 2013). Consultation with infectious disease is recommended due to the potential immunocompromised status of the patient and likelihood of multiple recent courses of antibiotics.

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## *Periodontal Considerations*

Preparation of the gingival tissues for oncology therapy involves calculus removal and removal of all sources of gingival irritation and infection such as restoration overhangs (Little et al 2008). This is recommended to be completed prior to the initiation of therapy or where this is not possible, at an appropriate time.

## *Further Considerations*

Overall planning may include the use of local anaesthesia alone, relative analgesia and local anaesthesia or general anaesthesia. The decision will be determined by a multidisciplinary approach based on the level of patient co-operation, the extent of dental treatment required, haematological status, oncology treatment pathway and the availability of services within each organisation.

## **Conclusion**

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Dental caries remains prevalent among children. Many children have untreated dental decay at the time of diagnosis. It is essential that this active disease is managed definitively to decrease the risk of oral complications during periods of immunosuppression and haematological instability. The information included is aimed to help the dental practitioner in treatment planning decisions and provide an approach to the provision of dental treatment during oncology therapy.

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