

Dental Care for the Medically Compromised Child



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INTRODUCTION

As medical science continues to make advances that increases the quantity and quality of life for children with previously untreatable diseases, dental practitioners are seeing more and more of these children for routine care. This is not only true in hospital based clinics, but community pediatric and general dental practices have an increasing number of medically compromised children present for treatment. As medical treatments improve, children are not

only living longer with these previously untreatable disease but they are also experiencing the side effects of their treatments that affect the oral cavity and dental health. The modern dental practitioner who sees children needs to be aware of this and be prepared to treat a population of children who previously did not exist.

Any dental practitioner who is going to provide treatment to the medically compromised child must be able to enter into dialogue with the patient's physician. This is not just a matter of asking the child's physician if the child can be treated. The dentist has to have a basic working knowledge of the child's disease process and be able to let the physician know what kinds of procedures are planned. When discussing dental procedures with physicians, they are primarily interested in the amount of

bacteremia that may result, the amount of bleeding that may result and the type of pharmacological behavior management that may be used. While many pediatric medical practitioners may be aware of the implications of dental treatment, some need to be informed how dental treatment can affect the patient's medical condition. The highest quality patient care results when there is a coordinated effort between the medical and dental services.

Understanding a patient's medical condition comes through formal training in hospital or pediatric dentistry, continuing education courses, library or web based research and through conversation with dental/medical colleagues. Medical practitioners are usually more than happy to discuss the plan of treatment for a patient when approached by a dentist who has a well thought out list

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of concerns. In addition, there are hospital based dental clinics associated with postdoctoral teaching programs that can serve as resource for the community based general or pediatric dentist.

It is often thought by dentists who do not treat medically compromised children that the safest way to treat a child with a medical condition is in the operating room under general anesthesia. This may or may not be true. There are indeed instances where the use of general anesthesia may be the best course of action. An example would be the older child who is autistic, combative and has a large number of deep carious lesions. It would most likely be safer for the patient and the practitioner for general anesthesia to be used to control the patient's behavior so that quality dental care can be delivered. The other end of the spectrum would be the child with severe pulmonary problems associated with cystic fibrosis. A child like this may not survive a general anesthetic and other options should be considered before taking him/her to the operating room.

What if a child is not a candidate for a general anesthetic and has treatment needs that cannot be deferred? What options exist then for a child such as this? One technique that can be used in a patient who needs restorations but for whom the placement of such restorations would put the child at risk is the atraumatic restorative technique or A.R.T. A.R.T. is a technique where hand instruments are used to remove the caries followed by placement of an adhesive, fluoride releasing material. A resin-modified glass ionomer is used as the restorative material. It has the advantage of having a dual cure, fluoride release and no etching required prior to use.¹ This technique was used in a 3 year old patient with benign neutropenia who needed minimal restorative treatment. The mother was not comfortable with the use of anesthesia to provide the treatment and was also very concerned about the risk of infection. Atraumatic restorative technique was used and the patient was very cooperative. By using this technique,

anesthesia including local anesthesia was avoided.

Antibiotic prophylaxis is another subject that arises when a medically compromised patient population is being treated. Guidelines are published by the American Heart Association with regard to the use of prophylactic antibiotics in children with congenital heart disease. However, the use of prophylactic antibiotics in other conditions such as sickle cell anemia, implanted orthopedic appliances and ventriculoperitoneal shunts have been debated. Standard American Heart Association regimens for antibiotic prophylaxis have also been used in children who are immunocompromised from conditions such as HIV disease, congenital immunodeficiency or cancer chemotherapy. The goal of antibiotic prophylaxis is to provide a large level of antibiotics in the blood stream at the time that the bacteremia is occurring. In children the standard regimen for oral/dental procedures is amoxicillin 50 mg/kg orally one hour prior to the procedure. The total dose should not exceed the adult dose of 2 grams. Children who cannot take amoxicillin due to allergy are recommended to be given either clindamycin 20 mg/kg not to exceed the adult dose of 600 mg. Alternatively cephalexin or cefadroxil 50 mg/kg not to exceed 2 grams or azithromycin or clarithromycin 15 mg/kg not to exceed 500 mg can be given. Children who are unable to take oral medications can be given ampicillin 50 mg/kg not to exceed 2 grams IV or IM within 30 minutes prior to the procedure. If the patient is penicillin allergic, clindamycin 20 mg/kg IV not to exceed 600 mg or cefazolin 25 mg/kg not to exceed 1 gram IM or IV thirty minutes prior to the procedure is recommended. It should be noted that cephalosporins should be used with caution in children with immediate-type hypersensitivity reaction to the penicillins as cross allergenicity may occur.² In some cases alternative antibiotic regimens may be recommended by the patient's physician. If an alternative regimen is suggested, this should be documented in the patient's record for medicolegal reasons.

As medicine continues to improve the

lives of children, more and more medically compromised children are presenting to dental professionals not only for routine dental care but also for orthodontic treatment. In addition, orthodontic appliances may be in place when the child is discovered to have a medical condition in need of treatment. The biggest concern when orthodontic appliances are in place is if the patient is going to be immunocompromised such as in the case of cancer chemotherapy or organ transplant. It is recommended that orthodontic appliances be removed prior to starting immunosuppressive therapy.³ This is so that the appliances will not cause mucosal damage and also so that they will not act as a trap for bacteria and caries formation. Chemotherapy causes mucosal thinning and ulceration which can be worsened by irritation from orthodontic appliances. Also, xerostomia can result from these therapies. Decrease in salivary flow may lead to a lack of natural cleansing and buffering of acid which will result in decay around brackets. Retainers are not recommended due to problems with fungal growth in the acrylic during periods of immunosuppression resulting in irritation of already friable mucosa. Further irritation of the mucosa can lead to increased ulceration and susceptibility to secondary infections.

Orthodontic therapy can be accomplished in children who are stable after organ transplant. As these children are considered to be immunosuppressed for the remainder of their lives, prophylactic antibiotics should be given prior to any manipulation that may cause gingival bleeding. Particular attention should be paid to maintaining meticulous oral hygiene. Cyclosporine A, a commonly used immunosuppressive agent, causes an increase in fibroblast activity resulting in gingival hyperplasia.⁴ Inflammation, due to poor oral hygiene, will make the gingival hyperplasia worse. In addition to cyclosporine other drugs that have been shown to stimulate gingival hyperplasia include the calcium channel blockers such as nifedipine. Children may be on this drug post-transplant to counteract the hypertension associated with cyclosporine. Gingival hyperplasia

can be surgically corrected with a gingivectomy. However, as long as the patient remains on the medication there is the possibility of recurrence.

Periodontal disease and bone loss is not usually associated with children. While every child should be screened during routine examinations to rule out periodontal disease, there are medical conditions that make the child more likely to have bone loss in both the primary and permanent dentition. Any child that has a decrease in neutrophils, either acquired or congenital, should be examined closely for signs of periodontal disease. An example would be cyclic neutropenia. In this disease the neutrophile count will undergo a rise and fall in a cyclical nature.⁵ Chronic infection of the gingival tissue will result in bone loss. Similarly diseases where neutrophile function is impaired, as in diabetes mellitus, attachment loss is more likely to occur than in the normal host.⁶ Bone loss may also result from direct infiltration of a disease process as in

Langerhan's cell disease. Infiltrates of eosinophiles replace bone giving the characteristic radiographic finding of "teeth floating in air".⁴ Any periodontal bone loss in a child needs to be investigated to rule out potentially life threatening conditions. The oral signs may be the first to appear and could lead to early diagnosis when recognized by the astute practitioner.

Unfortunately not every child can be saved by the miracles of modern medicine. There are still diseases for which there are no cures and treatments that are not 100% effective. For children who have a terminal illness, every effort should be made to ensure comfort. Consultation with the patients physician may be necessary to make sure that adequate pain control is achieved and that heroic efforts to save teeth are not misplaced. The dentist who treats the terminally ill child has to balance what may be "ideal" dentistry with what will be the best overall for the child.

In summary, dental practitioners who

treat medically compromised children have the responsibility of having a working knowledge of the child's disease and it's dental implications. The dentist must also have the ability to communicate effectively with other health care providers so that the child receives the very best in total health care.

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