The Early Childhood Caries Prevention Program in Palau

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Abstract: Early Childhood Caries is a significant public health problem in Palau. Data have shown that nearly 80% of children ages 3-5 years of age in Palau experience dental caries and a significant number of these children require general anesthesia to treat or remove painful or infected carious teeth. In response to this growing problem, the Division of Oral Health has systematically developed a prevention program in collaboration with the Maternal and Child Health Unit under the Ministry of Health. The core program involves integrating preventive oral health services into all regular prenatal and postnatal care programs and improving the capacities of health professionals to provide such services. The program promotes the idea that oral health is an important component to overall health and all efforts are made to integrate oral health into broader public health initiatives. Both health and process outcomes are being monitored by an oral health surveillance system, while preliminary data show improved oral health among young children. This paper takes a closer look at the development of the Palau program. (PHD, 2003; 10 (1), Pages 106-110)

Introduction

Early Childhood Caries (ECC) is a significant public health problem in Palau and most of the Pacific. ECC affects the teeth and has a negative impact on the general health and well being of children. This disease causes difficulty in chewing, speaking, sleeping and concentrating and untreated chronic infections can result in hospitalization for life threatening cellulitis. In Palau, a significant number of children require tooth extractions in the hospital under general anesthesia to clear their symptoms while an overwhelming majority of children experience tooth decay by the time they enter preschool. Due to the great extent of decay and limited resources of public health dental clinics, most of this decay remains untreated. The Ministry of Health and Bureau of Public Health have identified ECC as a significant health problem in Palau and are making efforts to address the problem. The Division of Oral Health has taken responsibility to develop an integrative ECC Preventive Program that is showing promise and this paper will take a closer look at its development.

Oral health care infrastructure

The Division of Oral Health, under the Bureau of Public Health, is the major provider of dental services for the 20,000 inhabitants of Palau. The division employs 12 full time equivalent employees (FTE) in a setting of a 6 chair hospital-based dental clinic with lab to provide general outpatient dental services for the public. An additional 7 FTE employees focus efforts on preventive programs which include the School Dental Program, the ECC Prevention Program and community outreach. The Division of Oral Health is allocated approximately 7% of the overall Ministry of Health budget from all sources. Government dental service fees are determined utilizing a sliding fee schedule according to income and citizenship. However, all dental services that are provided in the context of an established preventive program are at no cost for all service recipients. Aside from dental services provided by the government, there is a 2-chair Seventh Day Adventist dental clinic providing part-time services for the public.

Program development

A pilot "Baby Bottle Tooth Decay (BBTD) Prevention Project" began in 1991 as a response to general observation of extensive decay in preschool children. This project involved in counseling pregnant women about the importance of good oral health, providing scaling and prophylaxis for pregnant women (minimize pregnancy gingivitis) and for one year involved in distributing training or "sippee" cups to mothers of young children. There were no established policies or guidelines for the program and there was no evaluation done. It is not known what effect that the program had on decay rates and there are no records of any baseline oral health data at that time, other than that for elementary school children. With minimal funding and no plan developed for the program the activities ended without incident by 1994. The priority and focus for the division at that time was strengthening and developing the School-linked Dental Program.

Table 1 Palau Division of Oral Health, staff and budget allocation and encounters, 2001

	Hospital-based Clinic	*School Program & Community Outreach*	*ECC Prev Program*
% Division Budget	70%	20%	10%
# Encounters per year	8400	7000	2000
# Employees (full time equiv.)	13	5	2

The School Dental Program has had success in reducing the tooth decay rate in elementary school children through sealant placement and school preventive activities such as daily brushing and fluoride use. As example, in 1993, 8-year-old children averaged nearly 3 decayed, filled or missing permanent teeth (DMFT) and by 1999 the average was reduced to under 1 DMFT.[1] However, the decay rate for primary teeth remains extremely high. This is not surprising, as the School Dental Program was not designed or intended to address the serious early childhood caries problem that occurs prior to school entry. The division conducted an open mouth survey in 1998 on all 220 first year Head Start students (children age 3-5 years). This survey showed that 80% had untreated tooth decay and the average number of decayed teeth per child was nearly seven.[2] In the same year, 54 children (5%) in this age group required general anesthesia to treat or remove painful or infected teeth. All of this data were shared with key health managers in 1999 and many were surprised at the extent of the problem. At that time, Maternal and Child Health (MCH) managers and

personnel agreed to collaborate with the Division of Oral Health on an aggressive early prevention program. W.H.O. consultants assessing the problem in Palau were also very vocal about the need to start a preventive project and more key health managers, including the director of public health, became supportive of this idea. Formal planning started later in 1999 at the MCH Coordinators Conference in Hawaii when the U.S. associated Pacific Dental Directors and MCH Coordinators developed draft strategic plans focusing on prevention of ECC. The very strong support by Palau's MCH managers and staff became the absolute key to success for further development of a strong collaborative ECC Prevention Program in Palau.

Although some preventive activity was starting to occur again by 1999, a more comprehensive program was piloted by early 2000. The core component was the provision of oral health preventive services through prenatal and postnatal MCH clinics in addition to oral health education and promotion for the community. In 2001, the Palau ECC Prevention Program became more formalized with the adoption of the Palau Oral Health Improvement Plan that became a part of the National 5 year MCH Strategic Plan. This plan developed with input from a broad range of individuals and health care providers in the National MCH Planning Committee and Family Health Conference. In this same year, the Centers for Disease Control awarded Palau a cooperative agreement to help assist with infrastructure development. Currently, the Maternal and Child Health Section is developing national policies on prenatal and postnatal care that will include policies relating to the provision of early preventive oral health care as outlined in the oral health plan.

Table 2 Key milestones to Palau ECC Prevention Program development, 1998-2002

1998	ECC survey conducted, data collected
1999	Formal planning with MCH managers Support from other health managers WHO consultant provides assistance
2000	Staff training Standards development Program piloting
2001	Formal plan adopted as a part of MCH 5 year strategic plan CDC cooperative agreement awarded for infrastructure development
2002	Oral Health Surveillance System improved

Key components of the ECC Prevention Program & plan

There are five key components of the ECC Prevention Program and Plan: 1) Improving oral health preventive services targeting young children, 2) Improving oral health preventive services targeting pregnant women and new mothers, 3) Improving the oral health awareness of the community, 4) Improving oral health surveillance and 5) Improving the capacities of health professionals to provide preventive oral health services.

1. Improving oral health preventive services targeting young children:

As a part of Well Child care in Palau, all children and their mothers now must receive preventive oral health services as a part of immunization visits. Fluoride varnish applications have become coupled with these visits starting at 1 year of age. Every child presenting for immunization receives a topical fluoride varnish application on all of their erupted teeth and two additional applications within the course of a week. Children receive their first application at the MCH clinic and follow-up with additional applications at dispensaries, the hospital dental clinic or at the MCH clinic. This series of varnish applications occurs at age 12, 18, 24 and 36 months. Fluoride varnish is very safe to use on young children and its antibacterial and remineralizing effects are seen over a prolonged period.[3] Early screening exams are also provided in the MCH clinics starting when children are 18 months of age. These services are documented on an oral health progress form in the MCH medical chart and a take-home "Oral health MCH card" (Figure 1) that was developed and is used to track varnish applications and oral health counseling encounters. With this, parents can present with their cards and children to any Ministry of Health site for providers to do follow-up varnish applications and oral health counseling. Additionally, infant brushes, toothbrushes, paste and other promotional or educational materials (Figure 2) are provided to parents and children in the MCH clinics. Although dental personnel are providing most of these types of services, primary care providers and dispensary nurses are starting to provide the same types of services. In addition, as children with special health care needs are especially at risk for developing ECC, they are provided individualized preventive services along with their parents during Children with Special Health Care Needs (CSHCN) clinics.

2. Improving preventive oral health services targeting pregnant women and new mothers:

It has become policy that all pregnant women are provided oral health counseling and oral exams "on-site" in MCH prenatal clinics. Those women requiring treatment are referred for priority service at the hospital dental clinic at no cost. These activities have been started in response to the findings on caries bacteria transmission that are becoming widely accepted. Studies have shown that primarily mothers infect their children with caries causing bacteria (strep mutans) soon after a child is born.[4,5] It has also been shown that by improving a mother's oral health prior to delivering may reduce or delay this bacterial infection to their children.[6] Mothers are also provided oral health counseling at their 2 or 6 weeks postpartum physician visit and when they bring their child in for immunizations or CSHCN clinics.

2. Improving the oral health awareness of the community:

The Bureau of Public Health is trying to educate the community on a variety of health related issues such as: good parenting, breastfeeding, diet, personal hygiene, betel nut and tobacco use. Public health promotional messages and ECC prevention messages overlap considerably, so it is important to collaborate with various

MCH ORAL HEALTH CARD

Baby's Name:_____

Age	Oral health consultation	Varnish Appl.	F Daily Suppl.	Date/ Initial
2/6 wk	Y / n	n / a	n / a	
6 mo	Y / n	n / a	Y / n	
9 mo	Y / n	n / a	Y / n	
12 mo	Y / n	1 / 2 / 3	Y / n	
18 mo	Y / n	1 / 2 / 3	Y / n	
2 yrs	Y / n	1 / 2 / 3	Y / n	
3 yrs	Y / n	1 / 2 / 3	Y / n	
Other				
Other				

Counseling Guidance

	Dev'nt	Diet/ Nutrition	Hygiene	Fluoride
Prenatal	* Teeth dev 4 wks	* Well balanced diet, rist to calcium	*Improve oral health and hygiene of mother	
0-6 mo	* 1st tooth by 6 mon	* Extensivelly breastfeed * Avoid use of baby bottles	*Clean mouth after all feedings	
6 mo – 3 yrs	* All baby teeth by 15 months.	* Breast feed up to 2 yrs * If bottle	*Soft brush or infant brush after all feeding and at night	Daily (25mg) *Varnish appl. Start at age 1 yr.

Major risk factors for decay:

1. Poor diet
2. Poor Oral hygiene
3. Overuse of baby bottles
4. Low birth weight or underweight
5. Special needs
6. Med compromised
7. Mothers/ siblings with poor oral health (transfer bacteria and also adopt similar babies)

Progress notes and comments:

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Healthy tips for Parents:

Breastfeeding – is one of the most important things you can do for the health development of your child. Children who are breastfed not only have less decay but also tend to have straighter teeth than those are not.

Health Diet – is very important for the general and oral health of children. Choose healthy snacks such as fruits, vegetables other than candy and chips.

Mother's oral health – can affect the oral health of her developing child. Bacteria responsible for dental decay is usually transferred from mother to child every time of life. Mothers should try to improve their own oral health (even before delivery) as to minimize or delay bacterial transfer to their children.

Oral hygiene – (cleaning baby's mouth) should start at birth to wiping a baby's gums after all feedings and should continue with brushing when tooth erupt. Fluorated toothpaste should be used starting at around 18 mnths. (a pea size amount is enough)

Fluoride – is a natural recurring element, which helps strengthen the outer surface of teeth. Children in Palau should take fluoride supplements everyday starting at age 6 mnths. Fluorated toothpaste should be used starting by 18 mnths to 2 yrs. (only pea size amount). While fluoride vanishes may be used also to help strengthen teeth.

Consequences of decayed baby teeth – pain, infection, poor digestion, hospitalization, crooked teeth, speech problems, difficulty chewing, damaged permanent teeth, traumatic dental experience, ugly smile

Figure 1 *MCH Oral Health Tracking Card (take-home). Allows providers to easily know status of varnish applications and preventive encounters. The card also provides educational messages for parents and counseling guidelines for providers*

Figure 2 *Palau oral health educational & promotional items: pamphlets, hygiene aids (toothbrush and infant finger brush), kids toothpaste and baby bib and balloons.*

public health programs for education and promotion. The Division of Oral Health has recently participated or collaborated on a number of workshops and conferences such as lifestyles workshops, Family Health Workshop and Conference, Diabetes Conference, Breastfeeding awareness, Head Start cluster training and others. These collaborations are done for the purpose of not fragmenting oral health away from the rest of "health". The program's motto has become "A kisichel a bedengem ra uldimukl ra ungil omengetmeklel a ngered" which translates to "a healthy body includes having a healthy mouth". With this in mind, instead of holding a separate "Oral Health Day" for the community, a "Family Health Day" is being planned to promote many important areas in health, including oral health. For further development of the program, it will be important to collaborate even more to help the community understand that oral health is an important component to overall health.

A pilot program is being initiated to serve all high schools in Palau. As women in Palau have children at a young age, this program also hopes to improve their oral health and awareness and reduce or delay bacterial transmission to their future children.

Table 3 Palau oral health anticipatory guidance, schedule & activities, 2002

	Oral Health & Dietary Counseling	Fluoride Varnish x3 applications	Oral Exams	Fluoride supplements	Hygiene aids	Educational items
Prenatal	•		•			•
2 or 6 wks postpartum	•					•
6 mos.	•			•	•	•
1 yr	•	•		•	•	•
18 mos.	•	•	•	•	•	•
2 yrs	•	•	•	•	•	•
3 yrs	•	•	•	•	•	•

3. Improving oral health surveillance:

An important aspect of the prevention program is being able to accurately monitor progress, so that the program may be routinely evaluated. An oral health surveillance system is being developed to address this issue. In 2002, a basic screening tool was developed for younger children and ongoing monitoring of oral health indicators was started in the MCH clinics. The instrument was adopted from the Association of State and Territorial Dental Directors (ASTDD) basic screening survey instrument with some modifications. The key indicators include: percentage of children with a history of decay, percentage of children with untreated decay, percentage of children requiring urgent care (infection or pain) and percentage with ECC. As children already need to open their mouths for fluoride varnish applications, implementing open-mouth surveillance takes little extra time. These simple health status indicators have been selected because "non-dental" individuals understand them more easily. Data are collected in a logbook and entered into a database (SPSS) on a weekly basis and will be analyzed for oral health improvement. Some of the program process components, such as number of varnish applications, counseling sessions etc. are tracked in this database or through health encounter forms.

Additionally, a "Healthy mothers, healthy babies" survey with oral health components was recently piloted in the MCH clinics. This survey is for women who have children 6 months of age and it is hoped that this will assist assessing knowledge, practices and beliefs on various aspects of pregnancy and early parenting. The oral health related questions focus on breastfeeding and bottle-feeding habits, access and utilization of dental services during pregnancy, use of betel nut and tobacco and general oral health knowledge questions. A similar survey focusing exclusively on oral health knowledge, practices and beliefs is planned for 2003.

The core preventive program involves providing preventive oral health services as a part of regular MCH prenatal and postnatal care, in addition to improving the capacities of others to provide such services.

4. Improving capacities of health professionals to provide preventive services:

It is hoped that all health care workers in Palau will be able to integrate oral health and ECC prevention in their care for patients and the community. Not only are dental professionals being trained in preventive oral health, physicians, nurses and other primary care providers are being trained as well. Training sessions have been held for primary health care workers, physicians and MCH nurses on caries prevention, examining children and providing fluoride varnish applications. The Pacific Islands Continuing Clinical Education Program with the University of Washington has also assisted with this type of activity over the past two years. Additionally, there has been a similar preventive oral health component to the AHEC Family Practice Residency Program in Palau. All providers who encounter young children are expected to be able to identify early, moderate and advanced tooth decay in children and be able to provide oral health counseling and fluoride varnish applications. With planned decentralization of the health care system and MCH clinics, it is becoming increasingly critical to develop capacities of non-dental professionals to provide preventive oral health services in a variety of settings.

Conclusion

There has been considerable progress in the development of a comprehensive ECC Prevention Program in Palau over the last couple of years. This program has been systematically developed in response to the extremely high decay rates, which have been recognized as a serious public health problem. The core preventive program involves providing preventive oral health services as a part of regular MCH prenatal and postnatal care, in addition to improving the capacities of others to provide such services. An important component also involves improving the awareness of the public and collaborating with others to encourage healthy,

responsible parenting and lifestyles. The program will be evaluated and measured for progress through an oral health surveillance system tracking both process and health outcomes. It has been crucial to receive strong support in the form of action and policy on the part of MCH managers and personnel in primary care and their support is essential for future growth. Preliminary survey data in the MCH clinics show some reduction in ECC because of the efforts over the past year, but as the program is relatively new, only time will tell the full extent of reduction. It is hoped that with this continued approach and with ongoing improvement of the program, significant reduction in ECC will occur.

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Certain people are born with natural false teeth
(Robert Robinson in BBC Radio, Stop the Week 1977)