

Paul Glassman, DDS, MA, MBA^{1*},
 Max Anderson, DDS, MS, Med², Peter
 Jacobsen, PhD, DDS¹, Steve
 Schonfeld, DDS, PhD³, Jane
 Weintraub, DDS, MPH⁴, Alex White,
 DDS, DrPH⁵, Teran Gall, DDS⁶,
 Sandra Hammersmark, RN BSN⁷,
 Robert Isman, DDS, MPH⁸, Christine
 Ernst Miller, RDH, MHS, MA¹, David
 Noel, DDS, MPH⁸, Steve Silverstein,
 DMD, MPH⁴, Douglas Young, DDS,
 MBA, MS¹

¹University of the Pacific School of Dentistry;

²Washington Dental Service; ³Private Practice in
 Periodontics; ⁴University of California at San Francisco
 School of Dentistry; ⁵Kaiser Permanente's Center for
 Health Research; ⁶Private Practice; ⁷Harbor Regional
 Center; ⁸California Department of Health Services;

*Corresponding author: pglassman@pacific.edu

Spec Care Dentist 23(5): 160-164, 2003

ABSTRACT

People with special needs have more dental disease and more missing teeth than the general population. They also have reduced access to oral health diagnostic, preventive, interceptive and treatment services. If services are available, they can be complicated and costly. It is critical to prevent dental diseases in these individuals. This article presents a set of practical protocols for preventing dental disease in people with special needs. These protocols are designed to be used in community settings outside of a dental office.

KEY WORDS: Dental care for disabled, xylitol, chlorhexidine, mouthwashes, chewing gum, topical fluorides.

Practical protocols for the prevention of dental disease in community settings for people with special needs: the protocols

INTRODUCTION

People with special needs have more dental disease and more missing teeth than the general population.¹⁻⁶ They also have reduced access to oral health diagnostic, preventive, interceptive and treatment services.⁷⁻¹⁴ If services are available, they can be complicated and costly. It is critical to prevent dental diseases in these individuals.

For these protocols, the term "people with special needs" describes people who have difficulty accessing dental treatment services because of complicated medical, physical, social, or psychological conditions. The broad category of "people with special needs" encompasses a wide variety of individuals with different abilities and living situations. The specific application of these protocols must be made after considering an individual's living situation; their ability to carry out activities of daily living; the specific intervention under consideration; and the presence and quality of care-giving available on a daily basis. These protocols should be used by individuals who may have trouble following traditional oral health recommendations for controlling plaque, who may be unable to rinse and/or spit out oral solutions, and who may need assistance carrying out preventive recommendations.

These protocols focus on treatments that can be applied in "community" settings, including individual and family homes; residential care facilities; day work and treatment centers; skilled nursing facilities; hospitals; and other settings outside of a dental office or clinic. The community setting focus is essential because effective long term prevention must take place primarily outside of dental offices or clinics and many people with special needs have difficulty accessing dental offices or clinics. Some interventions, however, require a dental professional or include procedures that should be performed in a dental office or clinic setting because of the expertise required or because using these interventions is restricted by current laws and regulations.

THE PROTOCOL DEVELOPMENT PROCESS

These protocols were developed by a group of experts (the "Panel") who acted as "presenters" and "reactors" at the conference "Practical Protocols for the Prevention of Dental Disease in Community Settings for People with Special Needs," which was held on February 1, 2002, at the University of the Pacific School of Dentistry (PACIFIC). This conference was presented by PACIFIC's Center for Oral Health for People with Special Needs and sponsored by a Wellness Grant from the California Department of Developmental Services and the Redwood Coast Regional Center.

The Panel evaluated a review of the literature as well as evidence

presented at the conference and produced the background papers for this issue. Because there was insufficient evidence in the literature to determine a single best approach, the Panel recognized the need to "read between the lines" of the existing science in some areas to formulate their recommendations. The Panel considered some of the obstacles that people with special needs face when accessing dental treatment and performing preventive practices. The Panel also differentiated between those interventions that require a professional diagnosis, prescription, or application, and those interventions that do not. Finally, the Panel attempted to balance scientific evidence with the clinical expertise of oral health and social service professionals and the needs of those people who these protocols were designed to serve. The Panel attempted to design protocols that prevent dental caries and periodontal disease (efficacy), are useful (effectiveness) and reach those who need them (availability). After deliberating, the Panel developed protocols that represent their current expert opinion. Because advances in this area are rapid, it may be necessary to revise these protocols in the future.

Fundamental Oral Health Care Practices

These protocols assume that certain traditional and widely accepted preventive measures are being used to the extent that they can be for a given individual. If the measures listed below are not being employed, the following fundamental practices must be used in addition to employing the steps listed in the protocols:

- Using a fluoridated toothpaste accepted by the American Dental Association Council on Dental Therapeutics (ADACDT) (See below for regimen and special considerations.).
- Effectively removing bacterial plaque using a soft manual or mechanical toothbrush and dental floss.
- Using fluoridated water for drinking and cooking. This may require using bottled fluoridated water if the community water supply is not optimally or adequately fluoridated.
- Adopting a healthy diet by reducing fermentable carbohydrates intake, especially between meals.
- Regularly scheduling professional oral health care, including the use of professionally applied topical fluorides and pit and fissure sealants.

Regimen and Considerations for Using Toothpaste

An important fundamental oral health practice is using a fluoridated toothpaste accepted by the American Dental Association Council on Dental Therapeutics twice daily for 2 minutes. Typically this is done using a toothbrush during plaque removal activities, but for some people with special needs it may be beneficial to remove plaque outside of the bathroom using only a moistened toothbrush and apply toothpaste as a separate procedure. After the age of 12, or when a dental professional finds that gingivitis is present in an individual under 12 years of age, using a fluoridated toothpaste which contains an approved anti-gingivitis agent and is accepted by the American Dental Association Council on Dental Therapeutics, may be beneficial.

Rationale: The Panel reaffirmed the need for using fluoridated toothpaste as a fundamental oral health preventive measure. The American Dental Association Council on Dental Therapeutics extensively tests toothpastes and those products accepted by the Council have been shown to effectively reduce dental caries. There is also evidence that toothpastes containing an approved effective antimicrobial can reduce gingivitis and plaque and control calculus.

Regulations: Toothpastes are sold over the counter and no diagnosis, prescription, or intervention is required from a dentist or other dental professional for their use.

Example Products: There are numerous fluoridated toothpastes that have been accepted by the American Dental Association Council on Dental Therapeutics. When these protocols were developed the only toothpaste containing an approved effective anti-gingivitis, anti-plaque, and tartar control agent was Colgate Total[®], which contains Triclosan[®]. It is assumed that other toothpaste brands containing Triclosan[®] or equivalent products will be marketed in the future.

Other Fundamental Oral Health Care Practices

Additional information, including how oral health affects total health and the effect of total health on oral health, is available from many sources. It is particularly important to encourage smoking cessation, prevent the use of tobacco products and also adequately treat systemic diseases, such as diabetes, that affect oral health. However, these subjects will not be explored further here.

Organizing the Protocols

These protocols, in addition to the fundamental oral health practices described above, can benefit people with special needs. The protocols are listed in order of preference. Since evidence shows there are additive benefits from the first two interventions, the Panel recommends that they both be used. These first interventions are referred to below as the "Primary Preventive Protocols."

There may be circumstances where the other interventions are also beneficial. However, there may not be added benefit from employing additional interventions for all people. The decision to use additional modalities should be made after examination by and consultation with a dental professional, and in some cases involving a caregiver or social service professional. These interventions are referred to below as the "Other Preventive Protocols."

A review of the literature and supporting evidence for these protocols is contained in the papers that accompany these protocols and is not repeated here.

A regimen or alternative regimens are described for each intervention. A rationale for the recommendations is also described as well as the current regulations for using that intervention and examples of products that may be used.

THE PRIMARY PREVENTIVE PROTOCOLS

The interventions listed below constitute the primary protocols that the Panel recommends to prevent dental disease in people with special needs. They are listed in order of preference.

Xylitol

Use products containing xylitol (at least 50% by weight) as the predominant sugar with three exposures per day and five minutes per exposure. If chewing gum containing xylitol can be used, it should be chewed for five minutes three times daily. To achieve the required exposure, chewing may need to be supervised. For individuals who cannot chew gum, or when supervised gum chewing is not feasible, other xylitol-containing food products can be substituted. For infants there are delivery systems that use pacifiers with a reservoir containing a xylitol solution or traditional baby bottles can be used with solutions containing xylitol. For other individuals, dissolving a lozenge containing xylitol, mint, or lollipop containing xylitol can achieve the desired exposure.

Rationale: Xylitol effectively reduces dental caries and has an additive effect in individuals already using fluoridated toothpaste. Although most xylitol studies have used supervised chewing of gum containing xylitol, evidence shows that other xylitol-containing food products, which are easier to use for many people with special needs, can also be effective. The Panel recommends avoiding using gum in individuals who are unable to chew or who may swallow it, or when its use cannot be supervised.

Regulations: Xylitol is a natural sugar added to many food products and no diagnosis, prescription, or intervention is required from a dentist or other dental professional for its use.

Example Products: Chewing gum: Total[®], XyliMax[®], Advantage[®], XyliFresh[®]. For other products see the Oral Health Products Resource list at <http://www.dental.uop.edu/resource>.

Fluoride Varnish

Fluoride varnish should be applied using one of the following regimens. Selection of this regimen should be based on the feasibility of following that regimen for a given individual. Apply fluoride varnish three times per week (e.g. Monday, Wednesday, and Friday), once per year, or apply fluoride varnish once every six months.

The Panel recognizes that using fluoride varnish requires removing food debris by brushing or wiping off the teeth prior to application. This may not be possible with some individuals or under certain circumstances.

Rationale: Fluoride varnish products effectively reduce dental caries. Its primary advantages are that it does not require a dental office setting, it is much faster to apply than other topical fluorides, and it is better tolerated. After some products are applied, a temporary yellowish tint may appear on the teeth, which might concern some people.

Regulations: At this time, topical fluoride preparations, including fluoride varnish, can be applied in the following situations in California: using fluoride varnish requires a preliminary oral examination by a dentist before most dental auxiliaries can apply it. Registered Dental Hygienists in Alternative Practice (RDHAPs), however, can provide this service with a prescription from a dentist or a physician (see below).

A dental assistant, Registered Dental Assistant (RDA), or Registered Dental Assistant in Expanded Functions (RDAEF) may apply topical fluorides under direct supervision. (Direct supervision means the dentist must be present in the office and must view the procedure after completion.)

A Registered Dental Hygienist (RDH), Registered Dental Hygienist in Expanded Functions (RDHEF), or Registered Dental Hygienist in Alternative Practice (RDHAP) may apply topical fluorides under general supervision. (General supervision means the dentist need not be present in the office when the procedure is provided.) Independently and without the supervision of a licensed dentist, a Registered Dental Hygienist in Alternative Practice may provide this service if a prescription has been written by a licensed dentist or physician. A Registered Dental Hygienist in Alternative Practice may only perform the authorized duties in:

- Residences of people who are homebound
- Schools
- Residential facilities and other institutions
- Dental health professional shortage areas.

The law is even more restrictive in most other states, with fewer or no exceptions. A few states do allow other health professionals to apply fluoride varnish.

The Panel believes this very effective public health measure can be better utilized if regulations are changed. The Panel notes that fluoride varnish can be successfully applied by dental hygienists, dental assistants, physicians, nurses, and other health care professionals. These regulations should be changed and/or clarified to allow application by dental hygienists, dental assistants, nurses, and other health care professionals in community settings, without specific prescription, and without needing a prior oral examination by a dentist.

Example Products: Currently marketed products include CavityShield[®] (Omni), Duraflor[®] (Pharmasciences, Inc.), Duraphat[®] (Colgate). For other products see the Oral Health Products Resource list at <http://www.dental.uop.edu/resource>.

Other Preventive Protocols

The interventions listed below may be of additional benefit for some individuals. The Panel recommends that a dental professional examine the person and make recommendations in consultation with the individual and/or a caregiver or social service professional who understands the individual's living situation, their ability to carry out activities of daily living, and the presence and quality of caregiving available on a daily basis. From this information a recommendation can be made about using the following additional preventive interventions.

Fluoride Rinses

For individuals who cannot fully use the primary preventive interventions described above or for those with persistent decay in spite of the above therapies, rinses containing fluoride can help prevent dental caries. Even if individuals are able to use the primary preventive interventions, fluoride rinses may provide an additional source of topical fluoride. Fluoride mouth rinse is currently an optional preventive choice for all people over the age of 6 who can safely rinse and expectorate without ingestion. Sodium fluoride (0.05%) has proven to have anti-caries benefits and these effects are in addition to using fluoridated toothpaste. If a fluoride rinse is indicated, use a product that contains 230 ppm fluoride without alcohol. Rinse for 1 minute twice daily.

If an individual cannot rinse or spit out the solution, the solution can be applied with a cotton swab or sponge applicator (Toothette®) twice daily. Although there is no available evidence to support an additive effect when a 0.05% sodium fluoride rinse is used with a fluoride varnish, such an effect has been demonstrated when used with fluoridated toothpaste. A dental professional should be involved in the decision to add fluoride rinses as an intervention if the individual is younger than 6 and/or cannot rinse without ingestion.

Rationale: Fluoride rinses effectively reduce dental caries. The Panel does not feel that there was enough evidence of additional benefit when the primary preventive interventions described above were employed to include fluoride rinses as a primary preventive intervention. However, the Panel recognizes that in some circumstances using fluoride rinses can be beneficial and recommends that a dentist be involved in the decision to use these products. The Panel agrees that if an individual ingests some of the solution, the fluoride concentration is low enough not to cause concern. However, the feasibility of applying these solutions twice a day either as a rinse or with a cotton swab or sponge applicator may determine whether they can be used for a given individual.

Regulations: Commercial low concentration fluoride rinses (0.05% sodium fluoride containing 230 ppm fluoride) are sold over the counter and no diagnosis, prescription, or intervention is required from a dentist or other professional for their use.

Example Products: ACT® (Johnson and Johnson), Fluorid® (Colgate). For other products, see the Oral Health Products Resource list at: <http://www.dental.uop.edu/resource>.

High Concentration Fluoride Toothpaste or Gel

High concentration fluoride toothpaste or gel should be considered for individuals if previous recommendations do not adequately prevent dental caries or if it is believed they will not work. Examples could include individuals with xerostomia (dry mouth) resulting from medications, radiation treatment involving the salivary glands, or other causes. The decision to use them must also consider the ability of the individual or caregivers to supervise and control the application of these products since they contain concentrations of fluoride that could be toxic if sufficient quantities are ingested. These products typically contain 5000 ppm of fluoride and the recommendation is to brush with the toothpaste or gel before going to sleep at night, spit out the excess, and leave the residual toothpaste or gel on the teeth while sleeping. Water should not be used to rinse out the excess nor should water be consumed for one hour after using the gel or toothpaste.

A dentist should be involved in the decision to add high concentration fluoride toothpaste or gel as an intervention for a particular individual.

Rationale: High concentration fluoride toothpastes or gels have been shown to be significantly beneficial in caries prevention for specific individuals. The Panel concludes that a dentist must be involved in the decision to use such a product and the product must be used in well-controlled circumstances to prevent adverse effects that could result from ingesting the product.

Regulations: In California, using high concentration fluoride toothpaste or gel requires a prescription. However, these products do not require a professional to apply them.

Example Products: Currently marketed products include Control-Rx® (Omni), Neutracare® (Oral-B), Prevident® (Colgate). Note: There are numerous other brands of 5000ppm NaFluoride preparations. For other products, see the Oral Health Products Resource list at <http://www.dental.uop.edu/resource>

Chlorhexidine

For individuals who cannot use the primary preventive interventions described previously, or for those with persistent caries in spite of these therapies, using a chlorhexidine rinse can help prevent dental caries. The suggested regimen is to rinse with a half-ounce of chlorhexidine solution for 1 minute twice daily for 2 weeks. This regimen should be repeated 4 times per year.

If an individual cannot rinse or spit out the solution, the solution can be applied with a cotton swab or sponge applicator (Toothette®) twice daily. Because it is not clear that there is added benefit from this procedure for individuals who are able to use the primary protocols, a dental professional should be involved in the decision to add chlorhexidine rinses as an intervention for a particular individual.

Chlorhexidine more effectively reduces levels of caries-producing microorganisms than xylitol. For some individuals an initial course of chlorhexidine may be indicated prior to beginning a long-term regimen use of xylitol.

Rationale: Chlorhexidine rinses effectively reduce levels of caries-producing microorganisms and the incidence of dental caries. The Panel feels there was insufficient evidence that there was additive benefit when the primary interventions were employed to include chlorhexidine rinses as a primary intervention. However, the Panel does recognize that under some circumstances using chlorhexidine rinses can be beneficial and therefore recommends that a dentist be involved in the decision to use these products. The Panel agrees that the concentration of chlorhexidine in these products is low enough to cause no concern if an individual ingests some of the solution. However, the feasibility of applying these solutions twice daily with a cotton swab or sponge applicator may determine whether they can be used for an individual.

The Panel also considered using chlorhexidine to prevent gingivitis and periodontal disease. There is evidence that chlorhexidine can be effective in reducing gingivitis. However, the Panel concluded that at this time there is not enough evidence that it would be beneficial without regular professional care, including scaling and root planning. Even if regular professional care were instituted, the side effects such as alterations in taste, stained teeth, increased calculus formation, needing to use the product every day for a lifetime, and the unclear benefit, precluded the Panel from recommending the use of chlorhexidine rinses to prevent gingivitis or periodontal disease. A dental professional may recommend chlorhexidine rinses in conjunction with other treatment for gingivitis and periodontal disease in specific circumstances.

Chlorhexidine appears to more effectively reduce levels of caries-producing microorganisms than exposure to xylitol. However, xylitol will likely be better tolerated as a long-term intervention and may be equally or more effective in reducing dental caries. In some circumstances, a dental professional may recommend an initial course of chlorhexidine prior to instituting a long-term regimen of xylitol exposure.

Regulations: In California, using chlorhexidine rinses requires a prescription. The product does not require a professional to apply it.

Example Products: All rinses containing chlorhexidine

available in the United States at this time contain 0.12% chlorhexidine. Currently marketed products in the U.S. are Peridex[®] (Zila) and PerioGard[®] (Colgate). There are many other 0.12% chlorhexidine containing products available in addition to these brand name products. For other products see the Oral Health Products Resource list at <http://www.dental.uop.edu/resource>.

REFERENCES

1. U.S. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.
2. The Disparity cavity: filling America's oral health gap. Oral Health America, May 2000.
3. Haavio ML. Oral health care of the mentally retarded and Other persons with disabilities in the Nordic countries: present situation and plans for the future. *Spec Care Dentist* 15:65-9, 1995.
4. Feldman CA, Giniger M, Sanders M, Saporito R, Zohn HK, Perlman, SP. Special Olympics, Special Smiles: assessing the feasibility of epidemiologic data collection. *J Am Dent Assoc* 128:1687-696, 1997.
5. Waldman HB, Perlman SP, Swerdloff M. Use of pediatric dental services in the 1990s: some continuing difficulties. *J Dent Child* 67:59-63, 2000.
6. Oral Health: Factors contributing to Low Use of Dental Services by Low-Income Populations. United States General Accounting Office. Report to Congressional Requesters. September 2000.
7. Minihan PM, Dean DH. Meeting the needs for health services of persons with mental retardation living in the community. *Am J Public Health* 80:43-8, 1990.
8. Schor EL, Smalky KA, Neff JM. Primary care of previously institutionalized retarded children. *Pediatrics* 67:536-40, 1981.
9. McDonald EP. Medical needs of severely developmentally disabled persons residing in the community. *Am J Ment Defic* 90:171-6, 1985.
10. Ziring PR, Kastner T, Friedman DL, et al. Provision of health care for persons with developmental disabilities living in the community. *J Am Med Assoc* 260:1439-44, 1988.
11. Dane JN. The Missouri Elks Mobile Dental Program - dental care for developmentally disabled persons. *J Public Health Dent* 50:42-7, 1990.
12. Preest M, Gelber S. Dental health and treatment of a group of physically handicapped adults. *Community Health* 9:29-34, 1977.
13. Ferguson FS, Kamen P, Ratner S, Rosenthal R. Dental fellowships in developmental disabilities help broaden care of the disabled. *N Y State Dent J* 58:55-8, 1992.
14. Wilson KI. Treatment accessibility for physically and mentally handicapped people - a review of the literature. *Community Dent Health* 9:187-92, 1992.