

Community Based Prevention: The Good, The Bad, The Future

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Definition of terms

- Community – Any definable group of people
- Community Based Prevention – Efforts to reduce dental caries among specific groups of people by implementing targeted disease prevention programs

Dental Caries – “tooth decay”

- **Dental caries, also known as tooth decay or cavity, is a disease wherein bacterial processes damage hard tooth structure. These tissues progressively break down, producing dental caries (cavities, holes in the teeth).**

Source - Wikipedia

Dental Caries

Complex Disease

- Dietary Factors
- Behavioral Factors
- Microbiologic Factors – An Infectious Disease
- Socioeconomic Factors
- Anatomic Factors (Enamel Development)
- Other Factors. . .

The Dental Caries Problem:

- The most common chronic disease of children aged 6 to 11 and adolescents aged 12 to 19 years.
- Prevalence of caries in primary teeth of children aged 2-4 years has increased from 18% in 1988 - 1994 to 24% in 1999 – 2004.
- State-specific prevalence of caries among third graders ranged from 40.6% to 72.2%.

Community Based Prevention “The Good”

- Several strategies are very effective in reducing caries
- Benefit large segments of the population, particularly the underserved
- Can be very cost effective
- Allow for targeted approaches to prevention for high risk populations
- Can be “passive” prevention programs

Developing Community Prevention Programs

- Define the community of interest
- Collect relevant data on oral health status of the community
- Establish broad-based partnerships (coalitions)
- Determine prevention programs best suited to addressing the identified problem
- Develop the prevention plan
- Evaluate program and outcomes

Community Based Prevention

Current Strategies

- Community Water Fluoridation
- School Based Sealant Programs
- Fluoride Varnish Programs
- Health Education
- Supervised Tooth Brushing

Community Water Fluoridation

- First used in 1945
- Ranked as one of the 10 great public health achievements in 20th century
- 2006 – over 69% of US population fluoridated
- 2006 – over 184 million persons fluoridated
- Safe
- Effective

Community Water Fluoridation

- Depending on the size of the community, every dollar spent on water fluoridation saves from \$8 to \$49
- Water fluoridation saves more than \$4.6 billion annually in dental costs

School Based Sealant Programs

- Children receiving dental sealants in school – based programs have 60% fewer new decayed pit and fissure surfaces in back teeth for 2 – 5 years after a single application.
- Among children 90% of all decay is in pits and fissures
- 36 states report sealant programs serving 258,000 children

Fluoride Varnish Programs

- Ease of use and inexpensive
- Very effective
- ADA recommends use every 6 months for preschool children @ moderate risk, every 3 months for high risk
- Can be applied by non-dental personnel
- Safe for infants and toddlers

Health and Nutrition Education

- Questions exist about effectiveness of various educational programs
- Nutritional counseling aimed at reducing frequent sugar exposures
- Several new studies examining motivational interviewing showing promise

Supervised Tooth Brushing

- Little data to support instructional programs designed to decrease caries by promoting oral hygiene
- Very good data supporting decay preventing benefit of brushing with fluoride containing toothpaste
- Brushing with Fluoride toothpaste programs for children should use only small amounts of toothpaste to avoid fluorosis

Community Based Prevention “The Bad”

- All Community Based Prevention programs require resources
- Not all programs are effective for all populations
- Programs require a well developed infrastructure to maintain viability
- Programs should be linked to dental providers able to provide access to required care

Community Based Prevention “The Bad”

- Strong coalitions are needed to assure sustainable programs
- Community Based Prevention programs alone can not overcome workforce shortages, discrimination, poverty, poor education and the myriad of other problems associated with disease especially in underserved and minority populations

Community Based Prevention “The Future”

“ The trouble with our times is that the future is not what it used to be”

Paul Valery

Community Based Prevention “The Future”

- Caries Vaccines
- Chlorhexidine
- Polyvinylpyrrolidone Iodine (PVP-I)
- Diamine Silver Fluoride
- Xylitol
- Nonfluoride Remineralization
- Others ???

Caries Vaccines

- Efforts to develop vaccines against caries based on both active and passive immunity continues
- Most work has been done on animal models
- Most target strep mutans critical functions
- Some attempt to replace virulent strep mutans with non-virulent

Chlorhexidine

- Prescription rinses available
- Studies underway on chlorhexidine varnishes with mixed results
- Recent review of 14 publications of controlled clinical trials - moderate caries reducing effect when varnish applied every 3 -4 months

PVP - I

- Iodine was studied 3 decades ago with promising results but most human studies were very small
- Several more recent studies in young children with ECC show strongly encouraging results

Diamine Silver Fluoride

- Research outside of US demonstrated value in arresting and preventing recurrences of ECC
- Some evidence suggests it may be twice as effective as sodium fluoride varnish
- Some problems with staining of teeth

Xylitol

- Sugar substitute
- Non-cariogenic and anti-cariogenic
- Safe and effective when used habitually in gum or other confection
- 5-6 grams 3 x day needed for clinical effect in adults
- One study found Xylitol syrup 2 x 3 day @ dose of 8 g effective in preventing ECC

Non-Fluoride Remineralization

- Much interest by companies in developing products
- Remineralization of early caries lesions
- Products include professionally applied pastes, toothpastes, and gums
- Questionable effectiveness and little data on ECC prevention

Community Based Prevention

Final Thoughts

- Define the community
- Attempt to understand as much as possible about that community and the disease affecting it
- Identify the problem/disease you will attempt to prevent
- Develop Broad-based coalition

Community Based Prevention

Final Thoughts

- Determine potential prevention program
- Determine resources available for prevention program
- Develop program plan including an evaluation component
- Implement the plan
- Modify plan/program based on evaluation
- Link with dental providers to provide access to care