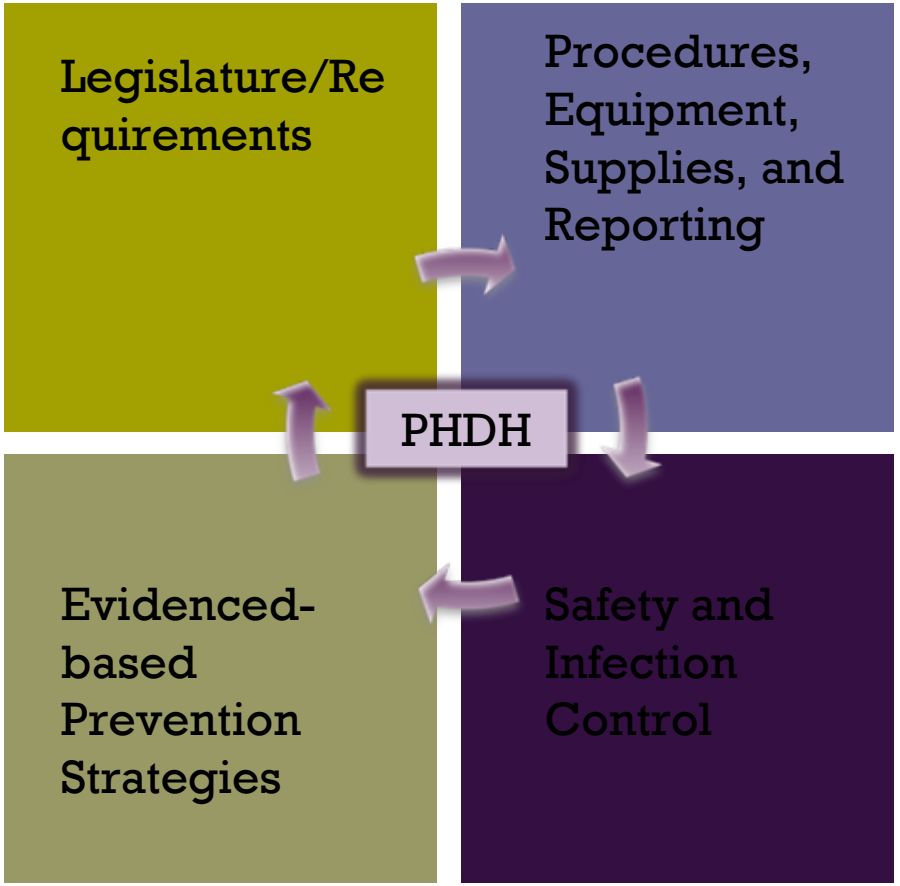
Public Health Dental Hygienist (PHDH) Toolkit

Evidence-based Prevention Strategies



Office of Oral Health
Massachusetts Department of Public Health

Evidence-Based Prevention Strategies

- Evidence-based public health is defined as the development, implementation, and evaluation of effective programs and policies in public health through application of principles of scientific reasoning, including systematic uses of data and information systems, and appropriate use of behavioral science theory and program planning models.

- A PHDH should provide clinical services that are:
  - Supported by credible and relevant scientific evidence
  - Intended for the population s/he is serving
  - Appropriate for the public health setting in which s/he is working

Where can you find evidence-based dental public health prevention strategies?

- **Look to the scientific literature!**
  - Centers for Disease Control and Prevention- Best Practices, Recommendations, and Guidelines
  - American Association of Public Health Dentistry- *Journal of Public Health Dentistry*
  - Association of State and Territorial Dental Directors- "Best Practice Approach"
  - American Dental Association- ADA Center for Evidence-Based Dentistry
    - Meyer, D.M. (2008). Evidence-based dentistry: mapping the way from science to clinical guidance. *JADA*; 139:1444-1446.

Evidence-based Oral Disease Prevention Strategies for Public Health Practice

- The next few slides will review the scientific literature that supports dental sealants and topical fluoride as evidence-based oral disease prevention strategies, as well as scientific guidelines that support school-based sealant programs.

Dental Sealants and School-Based Prevention Programs

- The evidence supports recommendations to:
  - Seal sound surfaces and noncavitated lesions
  - Use visual assessment to detect surface cavitation
  - Use a toothbrush or handpiece prophylaxis to clean tooth surfaces
  - Provide sealants to children even if follow-up cannot be ensured

Source: Gooch, B.F., et. al. (2009). Preventing Dental Caries Through School-Based Sealant Programs: Updated Recommendations and Reviews of Evidence. *JADA;140;1356-1365.*

Dental Sealants- Effectiveness

- "Pit-and fissure sealants can be used effectively as part of a comprehensive approach to caries prevention on an individual basis or as a public health measure for at-risk populations." (ADA, 2008)
- Placement of **resin-based** sealants on the permanent molars of children and adolescents is effective for caries reduction.
  - Reduction of caries incidence in children and adolescents after placement of resin-based sealants ranges from 86 percent at one year to 78.6 percent at two years and 58.6 percent at four years

RECOMMENDATION: Resin-based sealants should be placed on pits and fissures of children's and adolescents' permanent teeth when it is determined that the tooth, or the patient, is at risk of experiencing tooth decay

Source: Beauchamp, J. (2008). Evidence-based clinical recommendations for the use of pit and fissure sealants. Journal of the American Dental Association. 139(3): 257-268.

Dental Sealants- Incipient Lesions

- Placement of pit-and-fissure sealants significantly reduces the percentage of noncavitated carious lesions that progress in children, adolescents and young adults for as long as five years after sealant placement, compared with unsealed teeth.

- There are no findings that bacteria increase under sealants.
  - When placed over existing cavities, sealants lower the number of viable bacteria by at least 100-fold and reduce the number of lesions with any viable bacteria by 50 percent.

- **RECOMMENDATION: Resin-based sealants should be placed on early (noncavitated) carious lesions in children, adolescents and young adults to reduce the percentage of lesions that progress.**

Source: Beauchamp, J. (2008). Evidence-based clinical recommendations for the use of pit and fissure sealants. Journal of the American Dental Association. 139(3): 257-268.

Dental Sealants- Materials

- Resin-based sealants are more effective in caries reduction at 24 to 44 months after placement compared to glass ionomer cement in permanent teeth of children and adolescents.
- According to the ADA's expert panel, retention of dental sealants using glass ionomers is inadequate.
- **RECOMMENDATION: Resin-based sealants are the first choice of material for dental sealants.**

Source: Beauchamp, J. (2008). Evidence-based clinical recommendations for the use of pit and fissure sealants. Journal of the American Dental Association. 139(3): 257-268.

Dental Sealants- Placement

- The explorer does NOT need to be used **during an oral health screening** to determine if a tooth needs a dental sealant

- However, the use of (a dull) explorer can be used appropriately to:
  - Clean debris from fissures and interproximal spaces
  - Confirm and assess cavitations (breaks in the continuity of the surface) during sealant placement
  - Feel the texture (roughness) of non-cavitated lesions, if they extend well beyond the opening of the fissure
  - Help assess the sealant's quality & integrity

- **RECOMMENDATION: Visual examination is sufficient to detect early noncavitated lesions in pits and fissures. The use of explorers is not necessary nor recommended for the detection of early carious lesions.**

Dental Sealants- Placement

- Radiographs should not be taken for the sole purpose of placing sealants.
- Diagnostic devices are not recommended and may result in false positives resulting in premature restorative interventions.
- Sealing incipient lesions is recommended.

Source: Beauchamp, J. (2008). Evidence-based clinical recommendations for the use of pit and fissure sealants. Journal of the American Dental Association. 139(3): 257-268.

Dental Sealant- Tooth Prep

- In the placement of pit-and-fissure sealants, a clean tooth surface facilitates direct contact between acid etchant and enamel. The etched enamel provides microporosities into which resin-based material flows to form a mechanical bond that retains the sealant against the tooth surface.

- The tooth is commonly cleaned with pumice paste and a prophy angle; however, studies show that levels of sealant retention after surface cleaning with toothbrush prophylaxis are at least as high as those associated with handpiece prophylaxis.

- **RECOMMENDATION: Retention of sealants after a supervised toothbrush cleaning by the patient is at least as high as those associated with a traditional handpiece prophylaxis. Performing a toothbrush prophy prior to sealant placement may also translate into lower costs for materials, equipment and personnel.**

Source: Kolavic Gray, S., Griffin, S.O., Malvitz, D.M., Gooch, B.F. (2009). A comparison of the effects of toothbrushing and handpiece prophylaxis on retention of sealants. *JADA;140;38-46*

Dental Sealants and Dental Hygienists Practicing in Massachusetts

- 234 5.07(4): "A registered dental hygienist practicing in a public health setting may provide dental hygiene services including placement of sealants without first having a dentist examine the patient either pursuant to a written collaborative agreement that complies with requirements described in 234 CMR 5.08 or pursuant to a standing order under the general supervision of a dentist licensed pursuant to M. G. L. c. 112, § 45. "

Topical Fluoride

- American Dental Association Council on Scientific Affairs. (2006). Professionally applied topical fluoride: Evidence-based clinical recommendations. *Journal of the American Dental Association;137:1151-1159.*

- The recommendations for topical fluoride application are stratified by age groups and caries risk and indicate that periodic fluoride treatments should be considered for both children and adults who are at moderate or high risk of developing caries (ADA, 2006).

Topical Fluoride- Effectiveness

- Patients whose caries risk is low may not receive additional benefit from professional topical fluoride application

- **Fluoride Gel**
  - Fluoride gel is effective in preventing caries in school-aged children
  - There are considerable data on caries reduction for professionally applied topical fluoride gel treatments of **four minutes or more**
  - There is laboratory, but no clinical equivalency, data on the effectiveness of one-minute fluoride gel applications
  - There is insufficient evidence to address whether or not there is a difference in the efficacy of NaF versus APF gels.

- **Fluoride Varnish**
  - Fluoride varnish applied every six months is effective in preventing caries in the primary and permanent dentition of children and adolescents.
  - Two or more applications of fluoride varnish per year are effective in preventing caries in high-risk populations.
  - Fluoride varnish applications take less time, create less patient discomfort and achieve greater patient acceptability than does fluoride gel, especially in preschool-aged children.

- **Fluoride Foam**
  - **Four-minute fluoride foam** applications, every six months, may be effective in caries prevention in the primary dentition and newly erupted permanent first molars

Topical Fluoride- Treatment Options

- Topical fluoride applications prevent tooth decay by up to 30% (CDC).
- Professionally applied topical fluoride treatment options can include (ADA, 2006):
  - Gel
    - acidulated phosphate fluoride (APF),1.23% or 12,300 parts per million (ppm) fluoride ion, and
    - 2% sodium fluoride (NaF), which contain 0.90% or 9,050 ppm fluoride ion.
  - Varnish
    - 5% NaF, 2.26 percent or 22,600 ppm fluoride ion
  - Foam
    - Few clinical studies have proved effectiveness of foam treatments

BOX 2

Caries risk criteria.

Patients should be evaluated using caries risk criteria such as those below.

LOW CARIES RISK

All age groups
No incipient or cavitated primary or secondary carious lesions during the last three years and no factors that may increase caries risk*

MODERATE CARIES RISK

Younger than 6 years
No incipient or cavitated primary or secondary carious lesions during the last three years but presence of at least one factor that may increase caries risk*

Older than 6 years (any of the following)
One or two incipient or cavitated primary or secondary carious lesions in the last three years
No incipient or cavitated primary or secondary carious lesions in the last three years but presence of at least one factor that may increase caries risk*

HIGH CARIES RISK

Younger than 6 years (any of the following)
Any incipient or cavitated primary or secondary carious lesion during the last three years
Presence of multiple factors that may increase caries risk*
Low socioeconomic status†
Suboptimal fluoride exposure
Xerostomia‡

Older than 6 years (any of the following)
Three or more incipient or cavitated primary or secondary carious lesions in the last three years
Presence of multiple factors that may increase caries risk*
Suboptimal fluoride exposure
Xerostomia‡

* Factors increasing risk of developing caries also may include, but are not limited to, high titers of cariogenic bacteria, poor oral hygiene, prolonged nursing (bottle or breast), poor family dental health, developmental or acquired enamel defects, genetic abnormality of teeth, many multisurface restorations, chemotherapy or radiation therapy, eating disorders, drug or alcohol abuse, irregular dental care, cariogenic diet, active orthodontic treatment, presence of exposed root surfaces, restoration overhangs and open margins, and physical or mental disability with inability or unavailability of performing proper oral health care.

† On the basis of findings from population studies, groups with low socioeconomic status have been found to have an increased risk of developing caries.[38,39] In children too young for their risk to be based on caries history, low socioeconomic status should be considered as a caries risk factor.

‡ Medication-, radiation- or disease-induced xerostomia.

Assessing Caries Risk (ADA, 2006)

Topical Fluoride Recommendations: Children Ages 6 Years and Younger

- Low-risk: In addition to fluoridated water, fluoride toothpastes may provide adequate caries prevention in children with low-risk for dental caries.
- Moderate-risk: Children should receive fluoride varnish applications at six-month intervals in addition to fluoridated water.
- Higher-risk: Children should receive fluoride varnish applications at 3 to 6-month intervals in addition to fluoridated water.

Topical Fluoride Recommendations: Persons Ages 6 Years to 18 Years

- Low-risk: In addition to fluoridated water, fluoride toothpastes may provide adequate caries prevention in children with low-risk for dental caries.
- Moderate-risk: Patients should receive fluoride varnish or gel applications at six-month intervals in addition to fluoridated water.
- Higher-risk: In addition to fluoridated water, patients should receive fluoride varnish or gel application at six-month intervals; however, fluoride varnish applications or fluoride gels at three-month intervals may provide additional caries prevention benefit.

Topical Fluoride Recommendations: Persons Ages 18 and Up

- Low-risk: Fluoridated water and fluoride toothpastes may provide adequate caries prevention in children with low-risk for dental caries.
- Moderate-risk: Patients should receive fluoride varnish or gel applications at six-month intervals in addition to fluoridated water.
- Higher-risk: Patients should receive fluoride varnish or gel applications at three- to six-month intervals in addition to fluoridated water.

Public Health Topical Fluoride Programs/Resources

- Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States- CDC
- Best Practices for Fluoride Mouthrinse Programs- Association of State and Territorial Dental Directors
- BLOCK Oral Disease Fluoride Varnish Program- Massachusetts Department of Public Health Office of Oral Health
- ADA Chairside Guide- Evidence-based Clinical Recommendations for Topical Fluoride
- JADA Article- Fluoride Varnishes: A Review of Their Clinical Use, Cariostatic Mechanism, Efficacy and Safety

Public Health Dental Sealant Programs/Resources

- CDC- Updated Guidelines for School-based Dental Sealant Programs- School-based dental sealant program information
- Seal America- National Maternal and Child Oral Health Resource Center and the American Association for Community Health Dental Programs
- School-based Dental Sealant Programs- Ohio Department of Public Health and the National Maternal and Child Oral Health Resource Center
- ADA Chairside Guide - Evidence-based Clinical Recommendations for Dental Sealants
- Best Practices for School-based Sealant Programs- Association of State and Territorial Dental Directors

What's Next?

- The next series of PowerPoint presentations will review procedures, supplies, equipment and reporting that may be applicable to common public health settings in which a PHDH may work:
- Preschool Settings
- School-Age Settings
- Nursing Homes/Assisted Living Facilities