

Feature Article

Protocols

The Role of Caries Prevention Protocols in Pediatric Dentistry Specialty Programs

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abstract

Advanced specialty education programs in pediatric dentistry are often overwhelmed with patients who need restorative and surgical care, often on an emergency basis. Still, the Commission on Dental Accreditation Standards for Advanced Specialty Education Programs requires that residents receive didactic and clinical training in the prevention of dental caries. This paper contains several recommendations for strengthening the training of pediatric dental residents in caries risk assessment and prevention, including the suggestion that pediatric dental training programs become "dental homes" for their patients.

One of the overarching goals of the pediatric dentist is to guide young patients into becoming adults who will value good oral health and seek out dental care when the responsibility becomes theirs alone. There are many aspects to this journey, but the prevention of dental disease lies at the heart of the process. Prevention has been arguably a bigger component of pediatric dental education than any other specialty, with the possible exception of public health dentistry. Despite this long history, pediatric dental programs struggle to keep up with the rapidly changing knowledge base and technologies in the arena of prevention.

Dentistry must begin reorienting its approach to dental caries from a primarily surgical approach to a more preventive-oriented, nonsurgical, or medical-management approach. As Edelstein¹ has noted, dental caries is a steady-state disease with variable expression over time. A surgical approach to a steady-state disease is inefficient, creating a constant state of playing "catch-up." In the broader arena of pediatric dental practice or indeed in general dental practice, change must come to embrace more effectively the new concepts of prevention and caries management by risk assessment. Stewart² has addressed the needs and changes for the private practitioner. The aim of the present review is to specifically target changes that need to be made in programs that teach the pediatric dentists of the future. All pediatric dentistry programs recognize that preventing dental disease is less invasive, and therefore less expensive, than treating its effects. Yet the programs also must graduate individuals who are proficient at diagnosis, behavior management, space management, and a host of other skills, including the surgical management of caries. Virtually all of our programs are overwhelmed by requests for care from patients with high treatment needs, who often suffer chronic pain, and who require restorative and surgical

care, often on an emergency basis. Where, then, do prevention protocols find their place in pediatric dentistry programs?

Current Standards

The Commission on Dental Accreditation Standards for Advanced Specialty Education Programs in Pediatric Dentistry³ requires that residents receive didactic and clinical training in managing dental caries. In the section on biomedical sciences, cariology is mentioned under the heading microbiology, along with virology and immunology. Instruction in those topics is to be provided at the understanding level.^a In the clinical science core, instruction is to be provided at the in-depth level^b in oral disease epidemiology, which presumably would include dental caries. Dental caries is explicitly mentioned in a later item in the clinical sciences core, though it is included with periodontal diseases, pulpal pathology, traumatic injuries, and developmental anomalies. Specifically, programs are directed to provide in-depth instruction in "the scientific basis for the prevention and treatment of dental caries," in "infant oral health care," and in "the effects of proper nutrition, fluoride therapy and sealants."

It is not possible nor even desirable for these standards to be extremely detailed and prescriptive. Clearly, however, much is taught that is not explicitly addressed in the guidelines. If residents are truly to be able to offer caries prevention programs to their patients, they need to be exposed to additional information, some at the understanding level, some at the in-depth level.

Recommendations

First, in the biomedical sciences area, residents should receive information that reinforces at the understanding level what they learned in dental school about the histopathology of dental caries. Much of the nonsurgical management of caries is based on our ability to manage white spot lesions, reduce demineralization, and enhance remineralization. In some pediatric dentistry programs, that information may be taught as part of "fluoride therapy."

Programs should also ensure that under the topic of microbiology of dental caries, residents understand the transmissibility of mutans streptococci. They should know how and when the transmission is thought to occur and how it might be disrupted. Programs should encourage early dental visits. Our programs should adopt the age 1 year initial examination as recommended by the American Academy of Pediatric Dentistry, the American Dental Association, and the American Association of Public Health Dentists. One-year-old patients could be recruited by advising pregnant mothers of older patients, and perhaps by partnering with the departments of pediatrics and obstetrics in the programs' parent institutions.

The latter recommendation raises the issue of prenatal counseling. Until a few years ago, pediatric dental residents were required to participate in prenatal counseling programs. This activity was not easily arranged, so it became one of the most often cited deficiencies in program reviews. Eventually, it was dropped from the standards. Our current understanding of caries transmission, possible disruption of transmission, and the advisability of early dental visits suggests that prenatal counseling could become an important skill for the pediatric dentist. We also should be advising pregnant women of the impact that their own oral health can have on the outcome of their pregnancies. While I am not arguing for the reintroduction of prenatal counseling into the standards, I suggest that pediatric dentistry programs recognize the benefits of prenatal counseling and take advantage of these opportunities whenever possible.

The current standards do not mention early childhood caries as an entity, but this topic is likely

being taught under the items on "epidemiology of oral diseases" and "infant oral health care." We must ensure that pediatric dentistry residents have in-depth knowledge of this specific form of dental caries, including its etiologies and epidemiology.

Caries risk assessment is another concept not mentioned in the guidelines but which must be learned at an in-depth level by pediatric dentistry residents. Some programs, indeed some predoctoral dental programs, are using formalized risk assessment programs. Others are using less formal approaches. There is room for both approaches, but risk assessment must be strengthened as a foundation for the medical management of dental caries. Identifying children with the caries process prior to development of the signs of dental caries is an important skill. Residents should be exposed to the value of bacteriologic salivary assays for mutans streptococci and lactobacilli as a means of early risk identification. Residents should also know how to intervene once such patients are identified. Further, we should ensure that residents recognize that a child with carious lesions is at an elevated risk for further disease progression. Eradication of the signs of caries by means of crowns, fillings, and extractions does not eliminate the disease process. Residents should be able to design prevention programs for their restorative patients that will lower the risk for future lesion development.

Fluoride therapy and sealants are specifically cited in the standards. Certainly our programs should be teaching safe and cost-effective use of professionally applied topical fluoride. Risk assessment should be applied to determine which patients will benefit from topical application, and which topical product -- varnish, gel, foam -- is appropriate. The same analysis should be applied to the use of systemic supplements, fluoride mouthrinses, and prescription fluoride gels and pastes. Residents should be taught the scientific basis and clinical applications of an extended range of anticaries agents, including chlorhexidine, xylitol, and any other suitable antibacterials that become available in the future.

Finally, pediatric dental programs should, to the extent possible, become "dental homes"⁴ for their patients. This is a relatively new construct in dentistry. Pediatrics, however, has long seen the value of identifying for every child a practitioner who can provide health supervision in a safe and familiar environment, the medical home. The concept of a dental home is too new to have been assessed as a predictor of dental health, but data exist to support the notion that early access to dental care might result in fewer dental emergencies and better dental health.⁵⁻⁷

Nowak and Casamassimo⁴ suggested that the dental home be accessible, family-centered, continuous, comprehensive, coordinated, compassionate, and culturally sensitive. The one characteristic that may be difficult for pediatric dental programs to fulfill is continuity, defined as providing the same primary care providers from infancy through adolescence. Attending faculty could fulfill this role to some extent. The dental home concept fits well with the emphasis on comprehensive care that exists in pediatric dentistry programs. The problem, alluded to earlier, is the demands placed on programs for emergency and episodic care. Still, if pediatric dental practices are to function as dental homes, residents should be exposed to the concept and programs should emulate dental homes to the extent possible.

Conclusion

Pediatric dentistry programs are adjusting to the shifts in preventive strategies away from the idea that dental caries is inevitable and that surgical management of the lesions may even precede attempts at prevention. We are adopting the notion that our programs and our residents should be primarily engaged in health supervision, rather than only in the treatment of disease. Under this new model, we should be teaching and practicing early examination and risk

assessment. We should be providing anticipatory guidance to caregivers, enlisting them as partners in the oral health care of their children. We should be striving to provide true prevention, where possible, with programs designed to disrupt or reduce the transmission of caries-causing bacteria. Some programs have probably adopted these concepts and are involved to some extent in these activities. Others could benefit from presentations and publications of model programs.

The dental health care system is slow to change. If, however, pediatric dentistry programs embrace and teach the concepts discussed at this workshop, we could begin to see more contemporary preventive programs in use in pediatric dental homes in the near future.

Notes

- a. Understanding level: adequate knowledge with the ability to apply.
- b. In-depth level: a thorough knowledge of concepts and theories for the purpose of critical analysis and the synthesis of more complete understanding.

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