BRIEF COMMUNICATION

Money in Tension with Ethics: A Commentary

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Abstract: *Monetary incentives are frequently in tension with evidence-based and cost-effective clinical care, thus posing an ethical concern in the practice of dentistry. The purpose of this commentary was to examine the issue of treating children in the context of caries risk assessment and with specific reference to the periodic oral examination, radiographic surveillance, topical fluorides, and the pumice rubber prophylaxis. (Pediatr Dent 2017;39(7):431-3) Received June 2, 2017 | Last Revision September 6, 2017 | Accepted September 11, 2017*

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In Book One of The Republic, Plato describes a dialogue between Socrates and Thrasymachus:[1]

> ***Socrates:*** *But tell me, your physician in the precise sense, of whom you were just now speaking, is he a money-maker, an earner of fees, or a healer of the sick? And remember to speak of the physician who is really such.*
> ***Thrasymachus:*** *A healer of the sick…*
> ***Socrates:*** *Can we deny then that neither does any physician in so far as he is a physician seek to enjoin the advantage of the physician but that of the patient? For we have agreed that the physician is a healer…and not a money-maker.*

Socrates' provocative question is particularly appropriate for dentists who treat children today. Are we money-makers, earners of fees or healers? The practice patterns of dentists force an analysis as to the extent money is in tension with ethics.

In the Middle Ages, the concept of the learned professions emerged in which certain individuals, generally understood to be physicians (including dentists), attorneys, and clergy, were literate and possessed powerful knowledge to which the uneducated required access. These individuals professed that they would always use their knowledge and skills in the best interest of those seeking their services. Thus, the quintessential characteristic of health professionals today, as then, is trust. As the American Dental Association's (**ADA**) Principles of Ethics expresses it in defining the ethical principle of beneficence: "The dentist's primary obligation is service to the patient."[2] The ultimate duty of the dentist is to always do what is in the best interest of the patient; not necessarily what is in the best interest of the dentist, monetarily or otherwise.

I want to explore the tension between making money and ethics by juxtaposing the practice patterns of dentists in treating children with the scientific evidence supporting, or lack thereof, specific diagnostic procedures and preventive interventions. There are two assumptions underlying the tension I am addressing: (1) care provided to children must be consistent with evidence that the care is based on the best available science; therefore, it's in the best interest of the child and ethically appropriate; and (2) due to the existence of monetary incentives, dentists when treating children are potentially overusing interventions to enhance personal monetary gain, thus violating ethics principles.

Caries prevalence, risk, and clinical procedures. Prevalence studies indicate that 58 percent of six- to 11-year-old elementary schoolchildren are caries free in the primary dentition; 79 percent are caries free in their permanent teeth, and 41 percent of adolescents are caries free.[3] Data also indicate that 20 percent of the children in the United States have 80 percent of the disease[4]; the inference from this is that 80 percent of children have relatively little dental caries. Children with the greatest prevalence of disease come from low socio-economic status families.[4]

Diagnostic and preventive procedures are to be based on the unique circumstances presented by an individual child. As the ADA's Principles of Ethics indicates, the obligation to benefit the patient (child) must be within the bounds of clinical circumstances presented.[2] A treatment plan for caries diagnosis and prevention must be consistent with principles of caries risk assessment for the child. This challenges a one-size-fits-all protocol in clinical practice. No diagnostic or preventive intervention should be routine, a component of a standard office protocol. Each child is to be evaluated by caries risk guidelines as being at low, moderate, or high risk for dental caries.[5,6]

The ADA Health Policy Institute reported 2016 data on the most procedures performed by dentists for children.[7] According to insurance claims, they rank in the following order as: (1) periodic oral evaluation (recall); (2) prophylaxis; (3) topical fluoride; (4) radiographs (not including panoramic); and (5) pit and fissure sealants. These procedures accounted for 74.2 percent of all procedures claimed. These findings are consistent with the 2009 Medical Expenditure Panel Survey (MEPS) indicating that diagnostic (41.2 percent) and preventive (35.8 percent) procedures accounted for most procedures on children from birth to age 20, while restorative procedures accounted for just five percent; extractions and orthodontics accounted for the remainder.[8] These national statistics indicate that a relatively small percentage of children's treatment is restorative, with the predominance of procedures being diagnostic and preventive.

In considering preventive dentistry for children, the two most cost effective measures in preventing dental caries are already being accessed by the majority of America's children: (1) water fluoridation; and (2) brushing teeth with a fluoride dentifrice.[9] According to the Centers for Disease Control and

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Prevention (**CDC**), 66 percent of America's children live in communities with fluoridated water[10]; fluoride-containing dentifrices dominate the marketplace. Edelstein et al. applied a systems dynamic modeling analysis to the New York State Medicaid population of young children to compare potential outcomes of various preventive interventions.[9] Simulations projected 10-year disease reductions. Net savings only occurred from water fluoridation, toothbrushing with a fluoride dentifrice, and motivational interviewing. All other preventive interventions cost more than they saved. This was due to the high cost of preventive strategies requiring dental professionals for implementation.

Following is an analysis of the utilization of four diagnostic and prevention procedures when it is hypothesized that the majority of children in the typical practice are a relatively low risk for dental caries. The analysis relates specifically to pediatric dentists, as data are not available for the utilization of the various procedures by general dentists who treat children. However, it can be assumed that the practice patterns of general dentists are comparable.

Periodic oral examinations. Recalls are recommended for low-risk children at six- to 12-month intervals by American Academy of Pediatric Dentistry (**AAPD**) guidelines and every 12 months according to ADA guidelines.[5,6] A randomized controlled study of children by Wang et al. found no significant differences between the oral health of children who were examined every 12 months and those examined every 24 months.[11] In spite of these, 95 percent of pediatric dentists recall their patients every six months, with only five percent utilizing a variable recall schedule.[12] The average national fee of pediatric dentists for a periodic examination is $49.75.[13]

Diagnostic radiographs. Bitewing radiographs are recommended every 12 to 24 months for approximal caries surveillance for children at low risk, according to AAPD guidelines.[5] The importance of reducing X-ray exposure to children has been emphasized by the Society of Pediatric Radiology's campaign Image Gently. Over 80 health organizations, including dental organizations, have joined the campaign.[14] The majority of board-certified pediatric dentists expose bitewings at six-month periodic examinations.[12] The average national fee charged by pediatric dentists for bitewing radiographs is $44.[13]

Professional topical fluoride treatments. A recent review by the ADA's Committee on Scientific Affairs recommends that the professional application of topical fluorides only be employed for children with elevated risk of developing dental caries.[15] This is consistent with AAPD guidelines, which state that children with moderate risk for dental caries should receive topical fluoride treatments every six months and children at high risk every three months.[5] The AAPD guidelines do not recommend topical fluorides for children at low risk for dental caries. The CDC states that "for persons at low risk for dental caries, professionally applied methods of topical fluorides are unlikely to be cost-effective. The professional fees charged for topical fluoride treatments make their utilization in practice very cost ineffective, except for children with documented high caries experience or risk."[16] Yet the majority of pediatric dentists apply topical fluorides every six months,[12] for an average fee of $37.86.[13]

Pumice rubber cup prophylaxis. The most egregious use of a so-called "preventive" intervention is the pumice rubber cup prophylaxis (coronal polishing). There is nothing prophylactic (preventive) about a rubber cup prophylaxis. In identifying preventive methods to address children with low, moderate, or high risk for dental caries, neither AAPD nor ADA guidelines indicate that a pumice rubber cup prophylaxis is a preventive procedure.[5,6] It is simply not a standard of care, and for science-based reasons. While coronal polishing the teeth with pumice and rubber cup removes plaque from the teeth, plaque will return within 24 to 36 hours and must be removed again.

Plaque removal is a daily requirement of oral hygiene by parent and child, not a periodic requirement by a dentist. One adverse effect of a pumice rubber cup prophylaxis is that it removes the protective enamel pellicle—the biofilm of salivary muco-proteins affording protection to the tooth from acids in foods and beverages. The pellicle requires seven days to fully mature and again offer a buffering effect to dietary acids.[19] The pumice rubber cup prophylaxis is also injurious to the enamel surface, as it removes 0.6 to 4.0 microns of the enamel; the enamel zone is rich in fluoride as a result of exposure to fluoride, offering the protective benefit of fluoride for the tooth.[17-20]

In spite of this, 67 percent of pediatric dentist routinely perform a pumice prophylaxis on children.[12] It is inexplicable that most insurance carriers, both public and private, will pay for this procedure twice yearly for children. The average national fee for pediatric dentists is $63.08.[13] A toothbrush (and floss) prophy avoids the harmful effects of a pumice rubber cup prophylaxis; however, it accomplishes no more than a parent effectively brushing and flossing their child's teeth. A toothbrush (and floss) prophy is justified by some, as it is associated with teaching the parent and child how to effectively clean plaque from teeth. There is no evidence to document that such an instructional approach is effective.[21] However, it has been demonstrated that oral health instruction utilizing motivational interviewing is effective.[21,22]

It appears that monetary incentives create a barrier for the transfer of science to practice. As a result of the profession's silence on the lack of therapeutic value of pumice rubber cup prophylaxis for children, parents have come to believe that the procedure is an important preventive intervention. Do not deceive is a basic moral rule.[23] Failing to inform parents of the lack of benefit of a pumice rubber cup prophylaxis is a violation of basic ethics and the ADA Principles of Ethics.[2] As indicated, prophylaxis is the second most performed procedure for children by dentists. Millions of dollars are spent annually for prophys that offer no effective prevention for dental caries. There is no clearer example of the tension of money with ethics than rubber cup prophylaxis/coronal polishing.

Informed consent. Informed consent is a prerequisite for any procedure to be accomplished on a child, including diagnostic and preventive procedures. As the ADA Principles of Ethics indicate, informed consent is a core a concept of professional ethics based on the principle of respecting the autonomy of the child/parent.[2] Absent an informed consent, a dentist should not undertake any diagnostic, preventive, or rehabilitative procedure. Informed consent requires parents be provided adequate information regarding a procedure(s), such that they have an understanding adequate to provide a rational consent or refusal. In the context of the current discussion, this means that the nature, benefit, risks, prognosis, alternatives, and cost of the periodic examination (recall), radiographs, topical fluoride application, and pumice rubber cup prophylaxis must be provided to the parent to gain an informed consent before the procedure is accomplished. This prompts the question: To what extent do dentists who treat children meet the criteria of gaining an informed consent for diagnostic and preventive measures?

Conclusions

It can be inferred that a majority of children in dental practices are at low risk for dental caries. An evidence-based and cost-benefit approach to managing these children's diagnostic and preventive care would be: periodic oral examination at six- to 12-month intervals; radiographic surveillance at 12 to 24 months; utilization of topical fluorides only if in a non-fluoridated area and/or not utilizing a fluoride dentifrice; and eliminating prophys for all children while utilizing effective instructional strategies to teach proper oral hygiene.

Socrates would ask, "Are dentists real healers of children's oral diseases, or money-makers, earners of fees?" If the money made by dentists is earned honestly, that is, in keeping with scientific evidence for the cost-benefit effectiveness of performed procedures; and if an informed consent has been gained from the parent, then we are authentic healers. If not, the behavior must be challenged on ethical grounds; we are money-makers, earners of fees. Today, in the practice of dentistry, the tension between money and ethics is palpable.

References

1. Bloom, A. The Republic of Plato. Philadelphia, Pa., USA: Perseus Books; 2016:473.
2. American Dental Association. The ADA Principles of Ethics and Code of Professional Conduct. Revised to November, 2016. Chicago, Ill., USA: ADA; 2016:20.
3. National Institute of Dental and Craniofacial Research. Dental Caries in Children. Available at: "https://www.nidcr.nih.gov/DataStatistics/FindDataByTopic/DentalCaries/DentalCariesChildren2to11.htm". Accessed June 1, 2017. (Archived by WebCite® at: "http://webcitation.org/6udd21xMJ")
4. U.S. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. Rockville, Md., USA: DHHS; 2000.
5. American Academy of Pediatric Dentistry. Recommendations: Caries-risk assessment and management for infants, children, and adolescents. Reference Manual 2017-18. Pediatr Dent 2016;39(6):197-204.
6. ADA Council on Access, Prevention and Inter-professional Relation. Caries diagnosis and risk assessment: A review of preventive strategies and management. J Am Dent Assoc 1995;126(Suppl):1s-24s.
7. Gupta N, Yarbrough C, Vujicic M, Blatz A, Harrison B. Medicaid Fee-For-Service Reimbursement Rates for Child and Adult Dental Care Services for All States, 2016. Chicago, Ill., USA: ADA, Health Policy Institute; 2017:15.
8. Manski RJ, Vargas CM, Brown E, Carper KV, Macek MD, Cohen LA. Dental procedures among children age birth to 20, United States, 1999 and 2009. J Public Health Dent 2015;75(1):10-16.
9. Edelstein BL, Hirsch G, Frosh M, Kumar J. Reducing early childhood cares in a Medicaid population. J Am Dent Assoc 2015;146(4):224-32.
10. Centers for Disease Control and Prevention. Fluoridation statistics. Available at: "https://www.cdc.gov/fluoridation/statistics/2010stats.htm". Accessed June 1, 2017. WebCite® at: "http://webcitation.org/6udV2uw2")
11. Wang N, Marstrander P, Holst D, Ovrum L, Dahle T. Extending recall intervals for oral health in primary care patients. Community Dent Oral Epidemiol 1992;20(3):122-4.
12. Gibson TJ, Nash DA. Practice patterns of board-certified pediatric dentists: frequency and method of cleaning children's teeth. Pediatr Dent 2004;26(1):17-22.
13. ADA. Health Policy Institute. 2013 National survey of dental fees (pediatric dentists). Available at: "https://ebusiness.ada.org/Assets/docs/2515.pdf". Accessed June 1, 2017. WebCite® at: "http://webcitation.org/6udVkFwcd")
14. Image Gently Alliance. Home page. Available at: "http://www.imagegently.org". Accessed June 1, 2017. WebCite® at: "http://webcitation.org/6udRu1bJn")
15. Weyant RJ, Tracy SL, Anselmo Beltrán-Aguilar ED, et al. Topical fluoride for caries prevention: executive summary of the updated recommendations and supporting systematic review. J Am Dent Assoc 2013;144(11):1279-91.
16. CDC. Recommendations for using fluoride to prevent and control dental caries in the United States. MMWR Morb Mortal Wkly Rep 2001;50:1-42.
17. Zero DT. Dental caries process. Dent Clin North Amn 1999;43(4):635-64.
18. Stookey GK. In vitro estimates of enamel and dentin abrasion associated with a prophylaxis. J Dent Res 1978;57(1):36.
19. Koch G, Peterson LG, Johnson G. Abrasive effect and fluorine uptake from polishing and prophylactic pastes. Swed Dent J 1975;68(1):1-7.
20. Mellberg JR. The relative abrasivity of dental prophylaxic pastes and abrasives on enamel and dentin. Clin Prev Dent 1979;6(1):13-18.
21. Weinstein P, Harrison R, Benton T. Motivating parents to prevent caries in their young children. J Am Dent Assoc 2004;135(6):731-8.
22. Harrison R. Wong T. An oral health program for an urban minority population of preschool. Community Dent Oral Epidemiol 2003;31(5):392-9.
23. Gert B. Common Morality: Deciding What to Do. New York, N.Y., USA: Oxford University Press; 2004:179.