

SEALANTS

Implementing the sealant guideline



BACKGROUND

Because dental caries in young children is a significant public health concern in the United States, the American Dental Association (ADA) in 2008 published and in 2016 updated a practice guideline for the use of pit and fissure sealants. Even though this guideline was widely disseminated, estimated compliance with it has been between 0 to 5% and 38.5% to 50%. This significant gap between knowledge and implementation reflects the presence of barriers to compliance, yet only 2 studies have addressed the problem and both gathered information from private practice dentists. As larger, multi-site group practices become more common in dentistry, it's possible that their barriers to the implementation of the ADA's pit and fissure sealant guideline differ from those identified in the private practice studies.

METHODS

An anonymous survey of 110 general and pediatric dentists at a multi-site dental practice was conducted. Potential barriers to the implementation of the pit and fissure sealant guideline were divided into 3 domains: practice environment, prevailing opinion, and knowledge and attitudes. Descriptive statistics helped to summarize the results.

RESULTS

Sixty-three general dentists and 5 pediatric dentists responded to the survey (response rate of 62%). The year of graduation from dental school varied from 1982 to 2012, with the average at 1999 and the median at 2003.

Practice Environment Barriers

The practice environment barrier identified was being put at risk from a liability perspective. Dentists did not feel they had a work environment conducive to placing sealants or were called on to manage patient complaints when sealants needed placement.

A possible solution to the barrier of having a practice environment that was not conducive to placing sealants would have been to propose having dental hygienists and assistant staff place them. Many dentists believed that these other practitioners could adequately place a sealant, but many others felt the hygiene and assistant staff lacked the capacity in their schedules to place sealants. In addition, they believed it would be difficult to change the workflow to allow dentists and dental hygienists to place sealants.

Prevailing Opinion Barriers

Barriers to placing sealants related to the prevailing opinion included underestimating the percentage of their colleagues who were already implementing the guideline, being unaware

of the expectations of opinion leaders (which included lack of awareness of the guideline and that applying sealants was official practice policy), and misunderstanding the standard of practice.

This lack of awareness could be addressed by the practice establishing a policy or clinical performance standards about how non-carious cervical lesions (NCCLs) should be managed. If such a policy were in place, the practice could conduct audits and provide individual performance feedback about how dentists manage NCCLs. The practice could also institute a financial incentive to apply sealants. Because the practice where the respondents worked had such an incentive yet few of the dentists used sealants, it was apparent that the current percentage offered was insufficient to alter behavior.

Knowledge and Attitudes Barriers

Included in the knowledge and attitudes barriers were the lack of knowledge about the relative efficacies of the various ways to manage NCCLs, the belief that sealants are ineffective against decay, the belief that restoring an NCCL provides better outcomes than sealing, and the lack of sufficient skill in applying sealants. Few dentists felt they were unfamiliar with the ADA caries classification system definition of NCCLs and cavitated initial caries and could not distinguish between what lesions had or did not have macroscopic breakdowns in surface tooth structure. Diagnostic codes were seen as a way to address this inability to distinguish between lesions that should be sealed and those that should not.

DISCUSSION

This study sought to identify barriers to the implementation of the ADA guideline regarding the use of pit and fissure sealants in clinical practice. Dentists in this multi-site practice were unaware of the guideline, did not believe sealants could effectively arrest decay, and did not believe that applying sealants was the standard of care. None of the other barriers existed to any notable degree in this practice environment.

Clinical Significance

All of the barriers that were identified could be addressed by formulating interventions specific to the problem. Studies are needed to identify the input of other individuals involved in implementing the guideline, address facilitators of change who could implement the guideline in clinical practice, and identify ways to support these facilitators and break down the barriers to the use of sealants. The result should be better care for patients.

SLEEP

Normal sleep



BACKGROUND

Sleep has been considered a reversible stage of unconsciousness but in reality, it's a time when the body is hard at work. The normal physiology of sleep is subject to sleep drivers and follows a specific architecture that includes both a non-rapid-eye-movement (NREM) component and a rapid-eye-movement (REM) component. Each plays a role in the work of sleep. Dental clinicians should understand the normal physiologic states during sleep so as to have a better comprehension of what sleep-disordered breathing does to the body and specifically what happens during apneic episodes.

SLEEP DRIVERS

Humans are active during the day and physiologically programmed to sleep during the night. This diurnal cycle can be overridden, allowing the performance of work at normal sleep times and sleep during the daytime. Two drivers contribute collaboratively to maintain wakefulness or sleep (Figure 1). The homeostatic drive to sleep, termed Process S, is linearly related to the time since the previous sleep period. The longer it has been since you've slept, the stronger the desire is to sleep. The drive is related to a buildup of adenosine through the conversion of adenosine triphosphate to adenosine diphosphate and phosphate.

In Process C, which is the complementary drive, the circadian rhythm for sleep and wakefulness operates. During the day, as the homeostatic drive for sleep increases, Process C offsets this drive with a drive to maintain vigilance. Around 2 PM, many people experience a dip in the process and must fight off fatigue or take a nap. As the evening draws near, the circadian oscillations in hormone levels cause the activation of "sleep-on" cells in the basal forebrain and sleep takes over. Wakefulness increases the homeostatic drive to sleep, but sleep diminishes it. The longer the time spent in sleep, the lower the homeostatic drive becomes, then the circadian rhythm of Process C intervenes to consolidate the sleep time.

SLEEP ARCHITECTURE

Sleep consists of a progressive rhythmic architecture of alternating periods of various types of sleep. It begins with NREM sleep, which passes from light, sleep-onset N1 sleep through 45 to 50 minutes of N2 sleep, and then to deep restorative sleep (N3), which should occupy 20% to 25% of the total time spent in sleep. N3 sleep is also termed deep sleep, slow wave sleep, and sleep stages 3 and 4. Good quality, uninterrupted N3 sleep is essential for the body. During this period there is profound cardiovascular stability, growth hormone secretion, a global drop in blood flow of up to 44%, diminished sleep cortical activity, and synchronized brain waves.

NREM sleep should occupy about 5% of the total sleep time and reappears within the 4 to 5 sleep cycles that occur during the night. The brain is essentially idling during this time, although the body can move.

After N3 sleep, the level of sleep progressively lightens through N2 and N1 up to REM sleep. Over the course of this process, brain wave frequency gradually increases until it resembles that of the waking state. During REM sleep, brain waves are desynchronized, blood flow to the brain and brain metabolism increase, and vivid dreaming may occur. Although the brain is highly active, the body's motor function is inhibited. Normal REM sleep should account for 20% to 25% of the total sleep time, with the first period occurring 70 to 90 minutes after sleep commences. Initially the duration of REM sleep is short, but with subsequent REM periods, the time lengthens.

The early sleep segment, from 9 PM to midnight, seems to favor deep restorative sleep, with the latter hours of the night devoted to REM sleep by the circadian drive. Thus, going to bed too late can decrease the opportunity to experience deep restorative sleep, and REM latency may be less than the usual 70 to 90 minutes. A short REM latency can be a sign of narcolepsy.

REM SLEEP

Just as NREM sleep is the opportunity for the body to reset its mechanisms, REM sleep is the period for the brain to reset itself.