Caries Process and Prevention Strategies: Demineralization/Remineralization

Video Transcript

Hello, and welcome to dentalcare.com's cariology series. This session focuses on prevention. This is part 8 of a 10 part series entitled Caries Process and Prevention Strategies. This course introduces the dental professional to the concept of oral health promotion and education as a means of preventing caries. The topics discussed include understanding patient behavior, the barriers to change a patient may experience, why it's important for a dental professional to provide continuous support even when a patient is slow to change and helping a patient to set goals that promote caries reducing habits.

First, I wanted to go through a couple of clinical significant snapshots just to talk about the kind of things you might uh, come across in your practice. First, my patients seldom follow the advice and instructions I provide, why not? Uh, habits that determine health outcomes are formed at an early age and are not easy to change. Habits in the formative stage are shaped by many factors, ignorance or knowledge, family members, which is primary socialization, authority figures such as teachers and peers and friends, secondary socialization.

Merely passing on more information in the hope of overcoming ignorance does not work. For example, nearly every smoker knows the deathly consequences of their habit so they already have the information, but choose to continue smoking for many reasons. This is a prime example of cognitive dissonance. Mere show and tell as an oral hygiene instruction will fail unless the patient accepts that there is a problem that needs to be fixed, which is acceptance, is ready and willing to fix it, believes and trusts that what you are advising will fix the problem and understands that any sacrifices made will be worth the benefit, this is their contemplation.

Telling a patient he or she has a dirty mouth that they are not cleaning correctly will not by itself interest the patient in the show and tell as they do not yet have the motivation and belief that the sacrifice is worth the benefit, they have no acceptance. In oral hygiene instruction, the dental professional is attempting to change a habit and ritual developed over many years so it will not change in days or weeks. Think about how you would try to have someone change his or her handwriting style. It's become a habit and it will not change merely by showing nicer calligraphy.

Interestingly, many health care providers do not enjoy great success in changing the behaviors of their patients largely because they fail to recognize all the steps involved in this supportive but not prescriptive process. The learning objectives for this course are that upon completion, you, the dental professional should be able to explain the three levels of prevention, primary, secondary, and tertiary, to just be able to discuss why changing behavior can be difficult, to identify the multiple and complex barriers to change, to be familiar with the five stages of change, to be able to apply skills that enhance dentist patient communication, and to understand the importance of setting specific goals with the

patient to effectively promote caries reducing behavior.

Dental caries, commonly known as tooth decay is an oral disease in which the acid generated by specific types of unfriendly bacteria cause damage to the hard tooth structure. It's one of the most common infectious diseases among American children and adults and remains one of the most common diseases throughout the world. Caries prevention attempts to reduce the odds of developing this disease.

The dental health professional plays a crucial role in preventing caries by educating the patient about the causes of caries and by offering information that promotes caries reducing habits and hopefully puts an end to unhealthy habits. However, effecting behavior change in a patient is a complex process, it requires continuous support. Understanding the many psychological, social, cultural, and economic barriers to change, how to communicate effectively and how to help a patient set health promoting goals are discussed as a means to affecting change that can lead to caries prevention.

In general, preventive care refers to measures taken to prevent diseases instead of curing or treating the symptoms. The three levels of preventive care: primary, secondary, and tertiary are just, are detailed below. Primary prevention aims to avoid the development of a disease or disability in healthy individuals. Most population-based health promotion activities such as encouraging less consumption of sugars to reduce caries risk are primary preventive measures.

Other examples of primary prevention in medicine and dentistry include the use of fluoridated toothpaste and vaccinations for infectious diseases like measles, mumps, rubella, and polio. The focus of secondary prevention is early disease detection, making it possible to prevent the worsening of the disease and the emergence of symptoms or to minimize complications and limit disability before the disease becomes severe. Secondary prevention also includes the detection of disease in asymptomatic patients with screening or diagnostic testing and preventing the spread of communicable diseases.

Examples in dentistry and medicine include screening for caries, periodontal screening and recording for periodontal disease and screening for breast and cervical cancer. Tertiary prevention. The goal of tertiary prevention is to reduce the negative impact of an already established disease by restoring function and reducing disease related complications. Tertiary prevention also aims to improve the quality of life for people with disease. In medicine and dentistry, tertiary prevention measures include the use of amalgam and composite fillings for dental caries, replacement of missing teeth with bridges, implants, or dentures or insulin therapy for type two diabetes.

Behavioral change in an individual can reduce a person's risk of disease yet changing behavior in patients has proven to be difficult. Educating a patient is viable and offers information and skills that enhance an individual's ability to make healthy choices yet there's no guarantee that the patient will always make the best choices. For example, while the important advice to reduce the amount and frequency of sugar consumption and when possible limited to mealtimes seems clear cut and easy to follow, sugar consumption continues to increase in the population as a whole.

There are multiple theoretical models that demonstrate why changing a behavior, particularly a socially and culturally important ones such as feeding behavior is difficult. However, outlined here is the most useful information compiled from these various theories and the most practical tips that dental professionals can put to use in their practice to promote oral health. Patients do not always act rationally. It's important that dental professionals do not assume that just by providing information, their pair- patients will believe it or will behave in a rational way and immediately take action that follows that advice.

Not only do patients not always act rationally, multiple studies have found that information from health professionals, increased awareness and possessing more knowledge about the

cause of disease are not enough motivators to change the habitual behavior. Dental professionals must therefore learn to think of behavior change as a process and support the change rather than thinking that behavior change is instantaneous and simply based on information.

There are multiple and complex barriers to change. One of the main barriers experienced by people who are considering change is the attitude of those around them, which are typically influenced by ethnicity and culture. The beliefs and expectations of an individual's family members and peers have a very strong effect on a person's ability to change. Thus, it may be important to recruit family members or friends who support a behavior change to express frequently to the patient that the recommended change is a good thing.

Other social or psychological barriers may include factors such as distrust of medical healthcare providers, fear of medical settings and anxiety or fear, which breeds denial that there's problem. Behavior change can also be hindered by financial or socioeconomic circumstances such as a lack of health services where the patient lives, insufficient money to pay for dental visits and services and transportation difficulties.

Another set of barriers are related to communication such as not being fluent in the language the dentist speaks, illiteracy, limited understanding of scientific or technical terms due to poor education, learning disabilities that hinder the understanding of instructions or advice or unfair communication from the dental profession. The stages of change model devised by Prochaska and DiClemente suggests that there are five stages of behavioral change. These stages are pre-contemplation, contemplation, preparation, action and maintenance.

Giving advice to patients in relation to- to dental caries most often involves changes in the selection and consumption of foods and beverages and the home use of fluoride agents. Patients need motivation to follow your advice, and therefore must understand the benefits of their actions. Patients need to feel empowered by the knowledge that they can make a difference through their actions.

Stage one, pre-contemplation. In this stage, the patient does not necessarily realize that a problem exists, or if they do, that they do not understand it within their power to make the needed changes. Patients commonly believe their oral health status is due to how the cards were dealt. "I have weak teeth," the patient may say, and therefore feel there's no reason to contemplate taking any action to change things. In this phrase, it's important to help the patient accept that healthy teeth are possible and the repeated fillings are not necessary. Patients need to accept that they have a role to play in their health outcomes.

Stage two, contemplation. The patient now accepts that they have a role to play in their own oral health and that actions and sacrifices are necessary in order to enjoy this benefit, few or no cavities. They have to contemplate for themselves, not be ordered or instructed. The reducing consumption of sugary foods is worth doing and may not be too difficult. They have to agree to a plan with clear objectives that they can change to diet sodas, sugar-free gum and not add sugar to foods at the table, or use a sugar substitute. Upon acceptance of this contemplated action, they can then move to implement the plan of action.

Stage three or preparation involves testing the waters to become familiar with all that has to be done to bring about change. A date must be set for the action phase and this needs to be chosen carefully to ensure the fewest opportunities to change still exist in the environment. The patient will need to change their environment and these changes should be thoroughly planned. For example, empty the fridge of sugared sodas and replace with diet sodas, empty the sugar bowl and throw away the pack, the table sugar, throw away the sugared gum. The patient will need a lot of support from family and friends, as well as their dental professional during the first few days of the action phase. Thorough preparation is vital for a successful start for this action phase.

Stage four, action. Action is about executing all that has been prepared. This phase may take several months and minor relapses will occur. Support must be provided to get over these relapses and help the patient avoid the feelings of helplessness and failure.

And stage five, maintenance. This is the greatest challenge and most likely leads to relapse. During the maintenance stage, it's important that the benefit of the change can be realized and that help and support are still provided until new habits are well formed. Remaps should not be admonished, but congratulatory support should be given for the period of success. The cycle can then repeat itself through pre-contemplation. For smokers attempting to quit, it's been shown that it takes between 7 and 12 cycles before lasting success, in other words, tobacco freedom can be achieved. Setbacks are to be expected.

Putting the information together in a slightly more concise form according to the cycle of change model, pre-contemplation is the logical starting point where there is no intention of changing behavior. There may be an awareness of a problem.

In the contemplation stage, the person becomes aware there is a problem although no commitment to change has been made. In the preparation stage, the person is convinced in the need for change and is intent on making corrective action. During the action stage, the person is actively working to modify their behavior. For the maintenance stage, the necessary changes have occurred and the new practices have replaced the old ones. Relapse often occurs, the patient may revert to old habits, although they may learn from mistakes, which will hopefully make the next cycle through the process more successful.

Some examples. Taking an example from dentistry, a patient who has never considered their soda drinking habit to be relevant to the number of fillings they have, which is pre-contemplation, may be advised by their dentist to reduce sugary soda intake. This is contemplation.

The patient might then start to make small changes at first by reducing the number of sodas that they get at the vending machines at the office, preparation stage and after another prompt from the dental professional might cut out sodas altogether, as well as avoid that candies and chocolates they snack on throughout the day, this is the action stage. Over time, the caries preventive low sugar diet becomes the norm. This is when they're in the maintenance stage.

To help the student understand how stages of change can be applied to everyday statements, here are a few examples. Interproximal cleaning? I've never heard of that. It's an example of pre-contemplation. Could you tell me more about x-rays? What are the pros and cons? This is an example of contemplation. The first step I'm taking is that I'm stopping going to the office candy jar, an example of preparation. I made an appointment to have my teeth cleaned, this is an example of action. It's been almost six months now and I've had no sodas or snacking on candy throughout the day, great example of maintenance.

The dental professional should be aware that an individual may move back and forth between the stages, occasionally falling back to previous ones or relapsing. It's important to continue to encourage and advise a patient even when they relapse to previous unhealthy habits. Encouragement is a positive act which can help the patient re-establish a healthy habit. On the other hand, reprimanding a patient when they relapse such as if they go back to sipping sodas throughout the day could lead to a sense of failure in the patient that does not encourage the reestablishment of a healthy behavior.

The health professional should also be aware that the first two stages of change, pre-contemplation and contemplation can be very lengthy and a host of factors such as the barriers to change mentioned before can influence whether or not a patient takes the recommended action. Also, even though no change has yet been observed, it's very possible that a patient is moving toward

change. They may simply be lingering in the contemplation stage and continuing to gather information or seek advice or support that will bring on the change.

Studies show that it's important to set clear goals for the patient to help behavior change occur. Statements like you need to brush better could be unclear because the patient is left not knowing exactly what this means and why they need to do it.

Instead, it's advised that a dental professional follow these three goal setting guidelines. First give the patient a personally relevant reason for taking the health promoting action such as I can tell you how to stop this white spot lesion from becoming a hole and causing the need for a new filling. Second, make it clear what's to be achieved such as try to stop drinking sodas and snacking on candies throughout the day. Or third, suggesting a tip that helps the goal to be achieved such as why not have your sweets only at mealtime?

Motivational interviewing or MI is a client centered directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence. MI is a method that has been subjected to clinical trials for a wide range of behavior change problems. MI works by activating the patient's own motivation for change and adherence to treatment. The starting point for MI as a motivation for change is actually quite malleable and is particularly formed in the context of relationships. The way in which patients are approached can substantially influence their motivation for personal behavior change.

The spirit of MI has been described as collaborative, evocative and honoring of patient autonomy. Collaborative. In place of the uneven power of relationship in which the expert clinician directs the passive patient in what to do, there's an active collaborative conversation and joint decision-making process. This is regarded as particularly important. Ultimately, it's only the patient who can actually make the change.

Evocative. Often healthcare seems to involve giving patients what they lack, be it medication, skills or insight. MI seeks to evoke from patients that which they already have that activate their motivation and resources for change. It respects that each patient has personal goals, values, aspirations, and dreams. Part of the art of MI is connecting health behavior change with what patients care about, their own values and concerns and honoring patient autonomy.

MI also requires a certain degree of detachment from outcomes, not an absence of caring, but more of an acceptance that people can and do make choices. Healthcare professionals can inform, advise, and even warn, but in the end, it's the patient who decides to take action or not. Recognizing and honoring that autonomy is a key element in effecting behavior change. Human nature frequently resists being coerced and instructed on what to do.

Further information on motivational interviewing can be found at www.motivationalinterviewing.org and in the book especially written for the dental practice, Health Behavior Change in the Dental Practice. The evidence-base for successful behavior change is continually expanding and adopting current science will tip the balance in favor of success, bringing greater satisfaction to both the healthcare profession and the patient. In conclusion, this section has outlined concepts related to oral health promotion and education.

To be successful at promoting healthful caries reducing changes in patients, dental professionals should recognize the multiple and complex factors and barriers that influence behavior and the ability and willingness to change unhealthy habits. It's also been established that using clear, effective communication and setting specific goals with patients can go a long way in helping a patient to benefit from a dental professional's knowledge about the causes of caries and caries prevention.

Just a quick reference guide. Here are several images that provide a brief overview of the various stages of lesion initiation and progression. These may prove useful to you

when describing the lesion formation and reverse process to your patients. Now let's conclude this section by discussing how this information can help you in your practice. First, fully understanding prevention information will help you clearly identify evidence-based and scientifically supported interventions to reduce subsurface mineral loss and making decisions regarding your patients' at-home care in reduction of caries risk.

Second, prevention information but communicated at the level of the patient can be a powerful tool in driving compliance and overall adherence to your at-home oral care recommendations. Describing how caries develop, making the connection to your specific recommendation instills a strong sense of trust and confidence in patients and can be far more powerful than simply instructing patients to brush more often. Thank you.