

Caries Process and Prevention Strategies: Risk Assessment

The following is a transcription that has been taken verbatim from the presenter's audio. No Edits have been made.

Video Transcript

Hello, and welcome to dentalcare.com Cariology Series. This session focuses on risk assessment. This is part 10 of a 10-part series entitled Caries Process and Prevention Strategies. This course introduces the dental professional to risk terminology and methods for identifying caries causing factors and assessing a patient's risk for developing dental caries. It also outlines a risk protocol that can be used with patients. First, a couple of clinical significance snapshots or questions that might come up in your practice, such as what's the point of undertaking risk assessment for a patient? Isn't everyone who has natural teeth at risk of dental caries?

Well, dental caries is a preventable disease. For years, it's been treated after cavitation [inaudible] by restorative needs. Typically, the patient returned later with new lesions and required more restoration. Rather than dealing with all patients in the same way, the process of risk assessment can help identify those patients who are at higher risk of developing caries, and those who are at low risk. In making this differentiation, preventive efforts can be focused on the high-risk group so that their risk is reduced and caries reduced or avoided altogether. Having identified the risk factor in the high-risk group, a treatment plan can be designed to risk, to reduce the risk factors such as dietary modification, use of additional fluoride agents, et cetera.

A high-risk group should be recalled more frequently. The low-risk group still has some risks and they should be recalled and examined

at appropriate intervals to make sure that their risk is not increasing. The strongest indicators of risk include active disease, new lesions in the patient, active disease where new lesions in other family members are noted, frequent sugar intake, irregular oral hygiene, and infrequent use of fluoride toothpaste, poor quantity or quality of saliva, age, whether they're very young or very old and the presence of restored teeth or teeth having been extracted due to caries.

Our expectations for you the dental professional upon completion of this course should be that you will be able to define risk, risk factor, and risk assessment, to identify a biological environmental socio-cultural and economic factors that increase caries risk. To be able to evaluate clues from a patient's medical and dental history, to assess caries risk, to implement a risk assessment protocol, to be able to conduct a risk assessment survey, to choose individualized intervention strategies based on a risk assessment survey, to be able to understand the additional specialized needs of certain populations like the elderly or those with dry mouth.

And finally, to describe the caries management by risk assessment or CAMBRA system. Dental caries, commonly known as tooth decay is an oral disease in which the acid generated by specific types of unfriendly bacteria can cause damage to hard tooth structure. It's one of the most common infection di-, infectious diseases among American children and adults posing a serious public health issue. Assessment

of the patient's current caries activity and risk of future caries is an important part of dental practice. By identifying the many risk factors involved, more effective individualized management of caries can be provided. Also when patients are made aware of their risk of developing new caries or for the progression of existing lesions, this knowledge may encourage them to make healthful caries reducing changes in their habits and take a more active role in their oral care.

Here's a short video in which Dr. Margherita Fontana from the University of Michigan school of dentistry provides advice on why a risk assessment for caries should be conducted for all patients.

Risk assessment is an essential part of caries management. It should be done on every patient. It's not only a way to assess the risk of future disease or advancement of current disease in a patient, but most importantly, is a way of identifying what are the reasons why that patient is at risk so that a preventive tailored treatment plan to that particular patient needs is developed.

To understand the role of the dental healthcare provider in assessing a patient's risk of caries, it's important to get an overview of appropriate terminology. First risk, this is the probability that an event will occur. The risk factor is an environmental, biological, behavioral, or social factor confirmed by temporal sequence, which directly increases the probability of a disease occurring if it is present. If this factor is absent or removed, it will reduce the probability of a disease occurring. Risk assessment, this is the qualitative or quantitative estimation of adverse effects that may result from exposure to specific hazards or the absence of biologic influences.

The importance of risk assessment in clinical dental practices recognized as relevant by dental insurers. And a risk survey, an ideal risk assessment tool should not be time-consuming or too complex for use in a busy dental practice. And the information must be gathered in an organized methodological manner that benefits analysis. Estimating the

risk by gathering a broad range of patient data can result in a composite assessment of factors impacting oral health. This can serve as a guide for selecting preventative measures, as well as provide an inventory of the patient's current preventative practices to get insights into the patient's compliance to recommendations.

There are three steps to identify biological and environmental risk factors. Step one is noting the patient's medical history. Step two is noting the patient's dental history and step three, know what is happening in the oral cavity. With regard to the patient's medical history, this should include questions about the patient's current and past diseases or illnesses, current or past medications and current or past disease treatments. The reason it's crucial to take note of these is that many diseases medications can cause dry mouth, a factor linked to increased risk of caries, because there is insufficient saliva present in the oral cavity to protect and remineralize teeth during periods of acid attack.

Diseases or conditions that can cause dry mouth include Sjögren's syndrome, an autoimmune condition that causes immune cells to attack mucus producing cells in the body and presents itself mainly in women in their forties and fifties. Rheumatoid arthritis, diabetes, HIV Aids, Parkinson's disease, Alzheimer's disease, cystic fibrosis, asthma, hormonal changes related to pregnancy, perimenopause or menopause, lupus, anorexia nervosa, and pancreatic or liver disturbances, smoking and drug abuse, particularly of alcohol, opiates, and methadone also cause dry mouth.

Over 400 medications have a side effect of salivary gland hypofunction and 90% of the most commonly prescribed medications in the United States have been reported to cause dry mouth. These include anti-depressants, tranquilizers, hypnotics, antihistamines, anticholinergics, antihypertensives diuretics, appetite suppressants, muscle relaxants, and expectorants.

Medical treatments that cause dry mouth include chemotherapy because of decreased salivary flow rate and head neck radiotherapy, which causes damage to the salivary acinar cells.

It should be noted that older patients tend to be more prone to dry mouth since their glands are likely to be more vulnerable to the damaging effects of medications. And since they tend to be more likely to have medications, which they are more apt to be taken compared to younger patients.

Usually the patient is aware that they have a dry mouth because of the discomfort it causes. Dry mouth can also be detected in a clinical examination. The mouth mirror may tend to stick to mucosal surfaces, or the saliva will appear frothy.

With regard to the patient's dental history, while the presence of active carious lesions at the time of the examinations is clear evidence of caries. It's also important to get a sense of previous caries history. A history of multiple restorations will indicate high caries risk because a history of previous caries is the single best predictor of future caries development. It is also useful to ask about dramatic changes in caries activity. For example, if there are no dental problems for years, and then a sudden increase in infection that led to multiple restorations, this may help the dental practitioner identify the relevant change such as taking the medication that caused dry mouth.

Questions about a patient's dental history should also gather information about current oral hygiene practices and proficiency, including how often teeth are cleaned, what type of brush and inter-dental cleaning agents used, which toothpaste is used and how it's cleared from the mouth. And if the patient's water supply is fluoridated. Asking a patient about their diet is especially important. If he or she presents with active carious lesions or a history of multiple restorations, this way it's possible to uncover caries causing habits such as frequent sipping of sugary drinks, swishing sodas in the mouth or frequent snacking on sugary or sticky candies.

Note what's happening in the oral cavity. Besides looking for present and previous caries activity, it's important to note other factors that increase caries risk. Tooth morphology and alignment, such as areas that are crowded, teeth that are pitted or rough or teeth that are

physically difficult to clean can play a role in increasing caries risk. Restorations with faulty margins can also increase caries risk because they provide a perfect physiologic niche that can harbor cariogenic bacteria.

There are specific dental habits that can be incorporated through cult- curation and social norms. For example, in some cultures allowing an infant to fall asleep while sucking on sugared liquids is not only acceptable, but encouraged. In some social group links, edentulism or tooth loss is thought of as the natural progression in the aging process. And toothaches are normal. A patient living in poverty may not have access to dental care or toothpaste and other health care aids. These types of habits, practices and situations need to be identified, acknowledged and modified if possible. Risk assessment po-, protocol, there are three steps. Number one, conduct a risk assessment survey. Step two, consider individualized non-operative strategies for caries control and step three, consider additional strategies for special patients.

So for step one, conduct a risk assessment survey. Employing a survey similar to this can help a dental practitioner identify caries risk factors in an organized, methodical way. Another option for conducting a risk assessment survey is to access and download the appropriate caries risk assessment form from the American Dental Association's website. The ADA provides two different forms, one designed for patient zero to six years. And the other for patients over the age of six. These forms have been designed to aid the dental health practitioner in determining the level of risk present in each individual patient and can serve as an aid in both the initial assessment of risk, as well as tracking the implementation and progress against an intervention program.

Step two is to consider individualized non-operative strategies for caries control. This includes cleaning. The dental health care provider can start by reiterating simple oral hygiene tips for plaque control in the whole mouth, such as brushing teeth twice a day and flossing in between teeth, interdental cleaning. However, showing the patient where

the lesions are, whether this is with the use of a radiograph or by showing them the lesion itself with the help of a mirror, has been found to help the patient become more involved in their treatment and more compliant with instructions. Teaching the patient to clean the disease site before cleaning the rest of the mouth is also very useful and discussing ways to do that most effectively has been found to ward off caries progression. Suggestions might include using a different angle than usual when brushing to reach the diseased area, using a different design to brush or switching from dental floss to an interdental cleaner, with a handle to better reach carious lesion areas in the back of the mouth.

The use of fluoride, all patients should be encouraged to brush with over-the-counter fluoride containing toothpaste, at least twice per day. Fluoride containing toothpaste are regulated by the US Food and Drug Administration, the FDA. And are required to contain a clinically proven level of fluoride. To comply with this requirement, fluoride toothpaste in the United States generally contain between 850 and 1,150 parts per million of fluoride. Fluoridated toothpaste is low cost, very easy for most patients to use and is quite effective. Being linked with the 24% decrease in caries in permanent dentition, fluoridated toothpaste can also be used therapeutically by asking the patient to apply a dab of paste with a finger or a brush directly to a cleaned active lesion immediately before going to bed. This will allow an increased concentration of fluoride in the vicinity of the lesion at a time of day when salivary output is naturally low. For patients with active caries, who may not be able to clean their teeth adequately with a fluoride toothpaste, a 0.05% sodium fluoride rinse taken once per day, or a 0.02% sodium fluoride rinse taken twice per day should be recommended. Fluoride mouth rinses have been credited with providing an average reduction in DMFS of 27% when compared with a placebo rinse or no mouth rinse at all.

For patients with high caries activity, it may be necessary to recommend a high-dose prescription fluoride dentifrice gel, rinse, or

supplement tablet for at-home use. Fluoride can also be professionally applied in the form of a varnish after plaque removal by the dentist. This form of application has been linked to a 43% reduction on average in caries in the permanent dentition. Note that acidulated phosphate fluoride is contraindicated in patients with porcelain or composite restorations as it can cause pitting and etching instead of neutral sodium fluoride should be recommended for these patients.

Diet modification, in a patient with no active caries, the dental professional should review the role of risk factors in dental caries and remind the patient of how any changes in diet might cause them to get caries. The dentist or hygienist can counsel the patient to watch out for times in life when their diet can change to one that may increase caries risks, such as pregnancy, unemployment, divorce, retirement, and bereavement. A simple check regarding any significant changes in status [inaudible] subsequent visits. In a patient with active lesions, an analysis of the diet will help uncover possible caries culprits. One method is to ask a patient to recall all they have consumed such as food, drinks and medication in the last 24 hours. Another method is for a patient to record all they consume over a three to four day period. The data collected can help the dental professional work with the patient to devise some practical strategies for reducing the intake or frequency of sugary foods and drinks. One word of caution, because these methods of collecting data on dietary habits rely on full patient cooperation and honesty, and may not reflect the diet consumed over a much longer period, data should be interpreted with caution.

Recalling the patient, recall should be scheduled according to the patient's individual needs. For patients without active caries, recalling the patients once or twice annually, typically suffices. However, in higher risk patients who for some reason may not master plaque control themselves or who have decreased salivary secretion due to certain medical conditions, medications, or deleterious habits, it is recommended that a dental professional encourage the patient to return

more often for professional tooth cleaning. The interval at the beginning should be short such as every two to three weeks until the patient has reached an acceptable level of plaque control.

The interval between appointments may then be extended as a dental professional sees fit. A patient with dry mouth should be returned, returning every two to three months while the patient without dry mouth, whose caries activity appears under control, may only need to be seen every six to 12 months. During recalls the mouth should be examined for signs of patient compliance, plaque control and caries arrest or progression. New radiographs may also need to be taken. Depending on what the dental professional finds, he or she may feel the need to remind the patient about oral hygiene instruction and diet, discuss possible changes to current non-operative strategies or apply a sealing to active non-cavitated lesions.

Step three, consider additional strategies for special patients. One group of patients that need additional attention are those with the dry mouth. In addition to brushing, interdental cleaning, use of fluoride, in compliance with commonly recommended diet modification tips, patients with dry mouth can benefit from sipping water all day long and restricting intake of substances that increase dry mouth such as caffeine containing drinks. Most people will also benefit from saliva substitutes in the form of sprays, lozenges, sugar-free chewing gum or mouthwashes, some of which contain fluoride.

Another group of patients that need additional attention are those who cannot care for themselves due to illness or age. Many may have a diet that increases caries risk. For example, they made soft foods for easier chewing and swallowing, receive medications that come in the form of syrups containing sugar, or they may not frequently consume tooth helping nutrients, such as calcium and Vitamin C. In addition, they may have caregivers who are not very oral hygiene aware, or they may not want to be able to ask their caregivers for help in cleaning their mouths. One study found that only 5% of the elderly occupants in residential homes

ask their caregiver for help in cleaning their mouths.

Other patients who may need slightly different strategies in the general population include those with tooth sensitivity due to dentin exposure who may need toothpaste for sensitive teeth. Those who have hardened calculus deposits or tartar, may need additional help with tartar control.

CAMBRA system was developed as an evidence-based approach to the prevention, reversal, and treatment of patients with dental caries. The emphasis is on the whole disease process. It employs the caries balance method, taking account of all factors that contribute to the development of dental caries, the attacking factors and all factors that research has shown to be protective from dental caries. The defense factors. The assessment of this balance not only helps establish risks, but suggests the correct strategies to prevent or reverse the process. The CAMBRA system provides a more in-depth assessment tool as a key element of the overall approach, approach and takes account of caries disease indicators, social economic status, developmental problems, the presence of lesions or restorations placed within a previous three years, caries risk factors, visible accumulation of plaque and quantitative assessment of *Streptococcus mutans* and lactobacilli, frequent snacking, saliva flow, and salivary modifying factors, fissure anatomy, root surface exposure, and the presence of appliances, caries protective factors. These include systemic and topical fluoride sources, adequate saliva flow, xylitol in the diet, use of calcium and phosphate paste or chlorhexidine and clinical examination. The presence of white spots, decalcification, restorations, and plaque deposits.

The tool assigns patients to low, moderate, high or extreme risk and offers two formats. One for patients age zero to five years and one for six years onward. A key benefit of CAMBRA is that it focuses both the dental professional and the patient or their caregiver to consider all the factors relevant to the patient's risk and disease state. Shifting the focus away

from the traditional restorative approach of cavitation and restoration toward the cause of the disease and the need to modify the causes wherever possible. It also allows for greater communication and understanding between all members of the dental team.

In conclusion, in an attempt to reduce caries prevalence in the population and improve the oral health of patients, it's increasingly the responsibility of the dental professional to assess risk of new caries and caries progression. To assess risk of caries, a dental professional can collect useful information from a patient's medical and dental history, consider socio-cultural and economic factors that can influence a patient's oral hygiene and analyze a patient's diet. To assess risk, dental professionals can use a simple methodological protocol that includes conducting a risk assessment survey, recommending non-operational strategies, such as proper dental cleaning, use of fluoride and diet modification and recommending additional strategies for patients with special needs.

Just as 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 reversal process to patients. Let's conclude this section by discussing how this information can help you in your practice. First fully understanding risk assessment 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 and reduction of caries risk. Second, when communicated at the level of the patient, risk assessment 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.