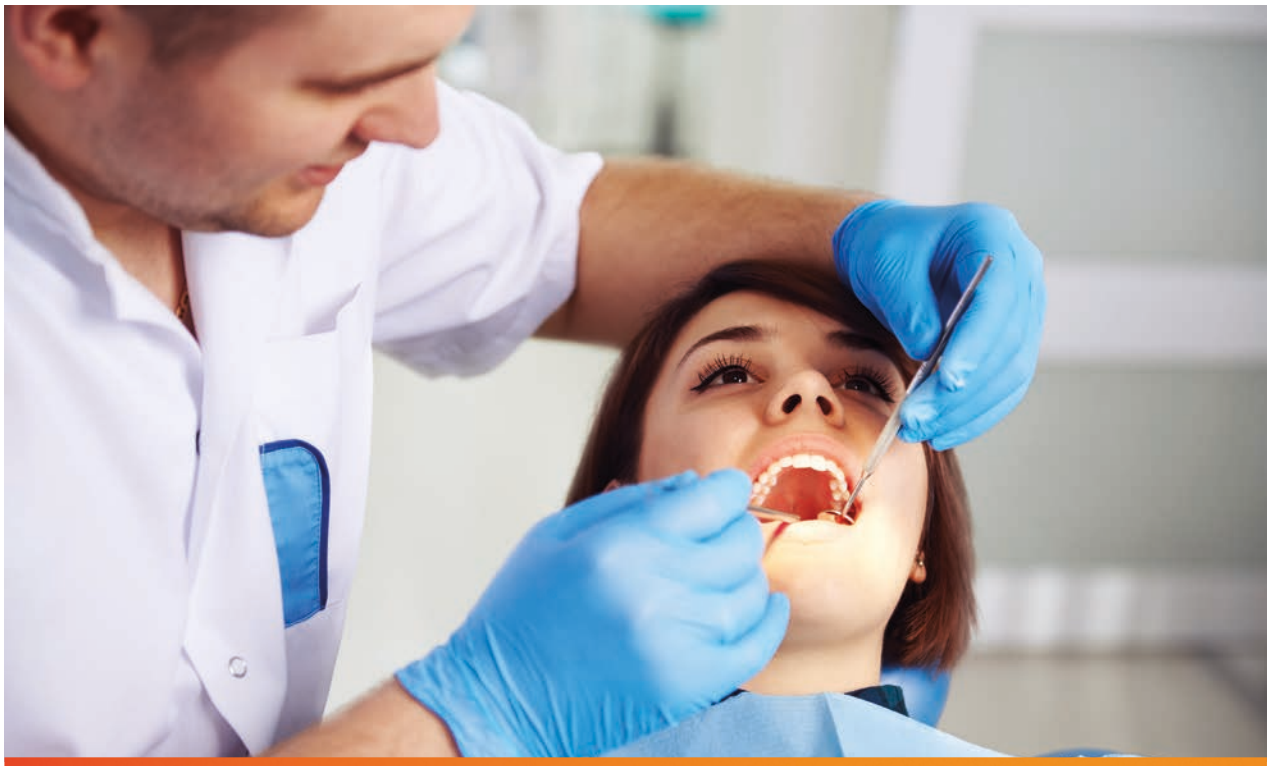
August 2019

Talking Points
in Dentistry

Brush Up on CPD



Brush up: Questions 2

Recognising and Recording Erosive Tooth Wear in Clinical Practice 4-5
Dr. Saoirse O'Toole, Clinical Lecturer in Prosthodontics at King's College London Faculty of Dental, Oral and Craniofacial Sciences, discusses factors leading to erosive tooth wear.

The BEWE 6-7
A closer look at the index of choice to record erosive tooth wear, by Head of Prosthodontics at King's College London Faculty of Dental, Oral and Craniofacial Sciences,Professor David Bartlett.

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Talking Points in Dentistry

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Article one: Recognising and Recording Erosive Tooth Wear in Clinical Practice

1. According to the Adult Dental Health Survey 2009, what percentage of patients were reported to have exposed dentine resulting from tooth wear?
2. How much greater is the chance of having erosive tooth wear if someone has 3 acid challenges a day as opposed to just one?
3. In a study by O'Toole et al. what proportion of people had a habit of sipping drinks slowly or swirling them around the mouth?

Learning objectives

- To recognise the prevalence of erosive tooth wear
- To understand the significance of dietary intake & intrinsic factors
- To reflect on the advice for toothbrushing in relation to acid challenge

Learning outcome: C

Article two: The BEWE

1. According to the article what is the level of prevalence for signs of erosive tooth wear?
2. What BEWE code would be assigned to a surface with signs of wear of greater than 50%?
3. What is the most damaging risk factor in the progression of erosive tooth wear?

Learning objectives

- To understand more about the group consensus to include erosive tooth wear as part of every clinical examination
- To be aware of the role of the Basic Erosive Wear Examination alongside the BPE
- To be aware of key patient advice for prevention of erosive tooth wear

Learning outcome: C

To answer the above questions, visit www.the-probe.co.uk and log in.
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Talking Points in Dentistry

Brush Up on CPD

Hello and welcome to the latest issue of Brush Up on CPD. This section, produced in partnership with GSK Consumer Healthcare, provides you with clinical features from which you can claim up to two hours of verifiable Continuing Professional Development (CPD), a mandatory part of registration with the General Dental Council.

Brush Up on CPD appears in *The Probe* five times a year and represents eight hours of verifiable CPD. We hope you find the articles interesting as well as educational. If you would like to see articles on a particular topic, or want to give your feedback on Brush Up on CPD, email info@purplems.com.

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Articles in this issue:

Recognising and Recording Erosive Tooth Wear in Clinical Practice

Dr. Saoirse O'Toole, Clinical Lecturer in Prosthodontics at King's College London Faculty of Dental, Oral and Craniofacial Sciences, discusses factors leading to erosive tooth wear.

The BEWE

A closer look at the index of choice to record erosive tooth wear, by Head of Prosthodontics at King's College London Faculty of Dental, Oral and Craniofacial Sciences, Professor David Bartlett.

Meet the authors:

Dr. Saoirse O'Toole qualified from Trinity College Dublin in 2009. She spent five years in clinical practice before starting her PhD in erosive tooth wear in 2014. She is now a Clinical Lecturer in Prosthodontics at King's College London Faculty of Dental, Oral and Craniofacial Sciences. Her research interests include identifying groups at high risk of tooth wear progression and developing practice-based methods to prevent and monitor tooth wear. This includes translational, clinical and laboratory methodologies in addition to behavioural research. She is active in public and patient engagement and in increasing awareness about the condition.

Professor David Bartlett is Head of Prosthodontics at King's College London Faculty of Dental, Oral and Craniofacial Sciences. David has published over 100 research publications, written three books and numerous chapters. He is internationally known for his research on tooth wear and in particular acid erosion. David is an internationally respected specialist in Prosthodontics and runs one of the largest specialty training programmes in Prosthodontics in Europe.

Recognising and Recording Erosi

The aim of this article is to explore key impacting factors on the progression of erosive tooth wear and understand how advice on toothbrushing and the Basic Erosive Wear Examination (BEWE) can protect the periodontal health of patients in addition to the reputation of dental professionals in an increasingly litigious society.

Erosive tooth wear is a relatively new term to represent the multifactorial nature of erosion, attrition and abrasion. We call it erosive tooth wear because we know that any mechanical form of wear such as abrasion or attrition happens at a much greater rate when there is any acid present.

This is why, even if we know that observed wear is mostly from attrition, we should always look for any acid sources.

We are all seeing more and more erosive tooth wear in clinical practice. The Adult Dental Health Survey reported that dentine was exposed in 11 per cent of the population in 1998 which rose to 15 per cent of the population in 2009[1]. A large trans-European study in 2013 found that 54.4% of UK participants had at least one tooth with moderate or severe tooth wear[2]. The frequency of eating between meals, including healthy snacking, is increasing globally and makes up a significant proportion of calories throughout the day[3,4]. Fresh fruit is a leading snack in the UK in the mid-morning and mid-afternoon[3]. On top of this is also the rise of homemade juices and fruit teas. In the US, the increased snacking on sugar sweetened beverages has also been linked to the obesity epidemic[4]. Most drinks apart from water, plain sparkling water, milk, coffee, and tea with no fruit flavourings are going to have an acidic pH. Diet drinks, a squeeze of lime/lemon in water, lemon and ginger tea, fruit cordials, juices (homemade or from a shop), every fruit flavoured drink, energy drinks, sport drinks and nearly every alcoholic drink will have a low enough pH that has potential to cause erosive tooth wear if they are consumed often enough. A comprehensive dietary analysis will also look for intake of fruit flavoured lozenges, acidic medications, fizzy vitamin tablets, fruit flavoured chewing gum or sour tangy sweets.

The significance of dietary intake

The problem is when daily acid challenges start to add up. Research at King's College London has shown that the chances of having erosive tooth wear increase for each additional acid challenge each day. If you only have one or less acid challenge a day there is a negligible risk of tooth wear. However, if you have two acid challenges every day your chances of having erosive tooth wear doubles. If you have three acid challenges every day your chances of having erosive tooth wear is over 13 times that of someone who sticks to one a day[5]. This risk increases further when acid challenges are consumed outside of meals. We found no increased risk when fruit was consumed with meals, even if fruit was had with every meal.

However, snacking on fruit on two separate occasions everyday increased the odds of having tooth wear by over five times[5]. This was worse for acidic drinks whereby two or more separate occasions of having an acidic drink outside of meals increased the odds of having tooth wear by over 11 times. This risk was halved when the drinks were consumed with meals only[5]. This is great news for a well-informed patient as it means that they can balance their risk throughout the day. If they know they are going to be meeting a friend and having a soft drink or a glass of wine that evening they can choose to have their mid-morning apple with their lunch instead and skip their juice in the morning. From a dental health care provider point of view, advising them on suitable alternatives like plain ginger tea instead of lemon and ginger tea, or choosing plain sparkling water with no lemon slice can make a difference to their chances of getting erosive tooth wear. For each daily acid challenge they reduce, they are reducing their risk.

Another thing to investigate is how they are consuming their acids. Those that chewed fruits over a period greater than ten minutes, such as those that nibbled on grapes or berries or chopped up fruit eating it piece by piece, had 12 times greater chances of having tooth wear than somebody who ate their fruit in less than five minutes. One in six people in a large study had a habit of sipping drinks slowly, holding the drinks in their mouth prior to swallowing or swirling the drinks round their mouths[5]. This can damage tooth structure at a much greater rate and

was associated with over 13 times greater risk of having erosive tooth wear. If a patient has only one acidic drink a day but presents with severe erosive tooth wear, try getting them to show you how they drink it or how long they are drinking it for.

Intrinsic factors for erosive tooth wear

We also have a greater understanding of the medical conditions that can cause erosive tooth wear. We have long been aware of the effect of diseases whereby stomach contents enter the mouth such as gastro-oesophageal reflux disease (GORD) and vomiting eating disorders. Dental health care providers should be aware of the increased risk for these patients. However, we should also be aware of patients using medication for asthma. Most inhalers have an acidic pH which can leave the intraoral pH low for a considerable period afterwards. This is particularly relevant for those with dry mouth. Sleep apnoea can affect up to 8% of the population. This creates a negative pressure in the mouth and when released can cause the stomach contents to travel up the oesophagus lowering the intraoral pH. Obesity increases your risk of GORD and sleep apnoea and we should be questioning our obese patients about the level of sugar and types of beverages they are consuming. Alcoholics have a frequent consumption of acidic drinks, are more likely to have reflux and have increased incidence of vomiting. We need to be aware of all of these groups in practice.

Advice on toothbrushing

There is long-standing debate over the timing of toothbrushing in relation to

ve Tooth Wear in Clinical Practice

an acid challenge. Some say wait an hour, some say half an hour, some say brush before your breakfast. Laboratory evidence shows us that brushing after an acid challenge removes almost all of the demineralised enamel. But does waiting for a period remineralise it enough to protect it? More recent studies have shown that full remineralisation of enamel with saliva is difficult to achieve even after a four hour waiting period[6]. One epidemiological study showed that delaying brushing was associated with a slightly increased risk of erosive tooth wear. Research at King's College London showed that brushing after an acid challenge was associated with tooth wear but this risk was negligible compared to an increased frequency of dietary acid intake[5]. This makes sense, if you can skip the fruit juice and just have fresh fruit in your porridge it is highly unlikely that you will demineralise your teeth such that they will be susceptible to toothbrush abrasion. We should always brush last thing before we go to bed at night. The advice should focus on not having something acidic every night before bed rather than waiting an hour before brushing.

We can also inform our patients on the importance of the RDA of toothpastes. Substituting a high-abrasivity toothpaste for a low-abrasivity fluoridated toothpaste could be a relatively easy substitution which may reduce their risk of erosive tooth wear. The higher the RDA, the greater the wear. High RDA toothpastes can wear teeth even in the absence of an acidic environment, while low abrasivity toothpastes do not[7]. Some toothpastes do not report the RDA and most whitening toothpastes have an RDA above the recommended value of 100. We should also remember that this recommended value of 100 is an arbitrary number and is not evidence based. The true safe RDA to prevent premature erosive tooth wear may be lower than this. It may be worth asking our toothpaste representatives to publish data on the REA (the relative enamel abrasivity) as it is often different from the RDA. A good home care routine consisting of brushing twice a day with a low RDA fluoridated toothpaste, using a non-aggressive brushing technique and a medium toothbrush is something that most patients are capable of. If the patient has a high caries or erosion risk, a supplemental fluoride mouthrinse may be of greater benefit than a third brushing incident.

The use of the BEWE in daily practice

The first step to diagnosing erosive tooth wear in practice is to look for it. Recent data has shown that established dentists are not recording erosive tooth wear in their clinical notes. More recently qualified dentists are more likely to record, but are still only recording it in 48% of patients[8]. Recently, a consensus statement involving the BDA, BSDHT, FGDP (UK), medicolegal advisers, dental students' associations, the industry and academics have agreed upon the use of the BEWE as the most straightforward tool to record erosive tooth wear alongside the BPE. You can use the BEWE to record all tooth wear regardless of the aetiology in a simple manner, similar to the BPE. Working through each sextant, pick the worst affected surface in each sextant. Grade the surface based upon there being no wear (BEWE score 0), mild wear resulting in slight changes to the surface texture but no observable defects (BEWE score 1), a distinct defect or wear involving less than 50% of the surface (BEWE score 2) or a distinct defect or wear involving greater than 50% of the surface (BEWE score 3) and then move onto the next sextant. Using this simple tool in practice will mean that you are looking for wear and noting it. This is increasingly important in today's litigious society.

For more information for you or your patients on risk factors, diagnosis, the BEWE or even a plug in to install a BEWE function in SOE software you can visit www.erosivetoothwear.com.

CPD questions:

1. According to the Adult Dental Health Survey 2009, what percentage of patients were reported to have exposed dentine resulting from tooth wear?

a. 7%
b. 9%
c. 11%
d. 13%

2. How much greater is the chance of having erosive tooth wear if someone has 3 acid challenges a day as opposed to just one?

a. 2 times greater
b. 5 times greater
c. 8 times greater
d. 13 times greater

3. In a study by O'Toole et al. what proportion of people had a habit of sipping drinks slowly or swirling them around the mouth?

a. One in 100
b. One in 25
c. One in ten
d. One in six

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The BEWE (Basic Erosive Wear Examination)

The aim of this article is to raise the profile of the Basic Erosive Wear Examination (BEWE) and explore the reasons it is an essential tool for improving periodontal health, alongside key patient education.

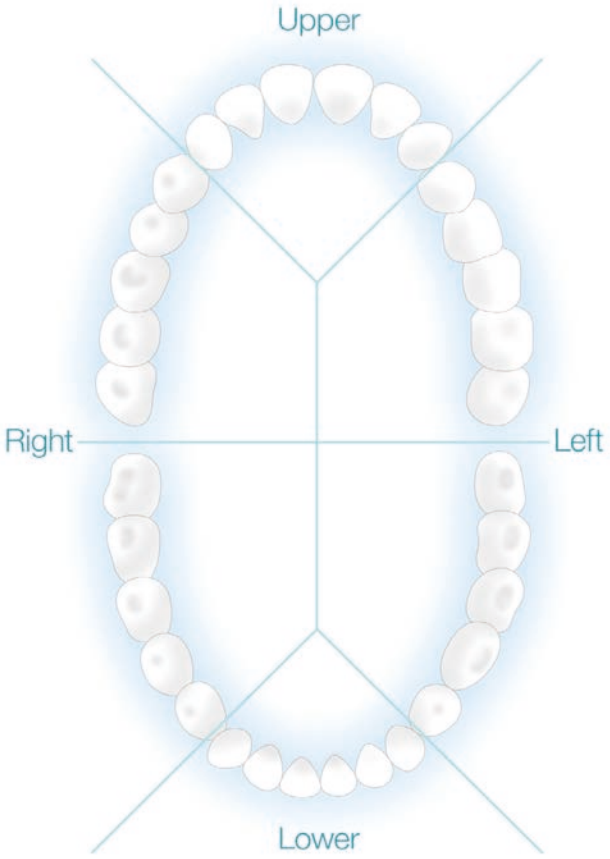
Erosive tooth wear is the third most commonly observed dental condition, after caries and periodontal disease[1]. Modern lifestyles and snacking, combined with people retaining natural teeth for longer have contributed to the prevalence, which may increase. Anecdotal evidence suggests that in general dental practice it is under-diagnosed. This conflicts with the prevalence data and places responsibility on our profession to record and, when appropriate, provide preventive advice to limit progression.

In December 2018 representatives from organisations including FGDP(UK), BSDHT, KCL, DPS and the Erosive Tooth Wear Foundation met to consider the need for erosive tooth wear to be part of every clinical examination. Each representative gave a short presentation about the impact of tooth wear in their area of interest. A patient who had previously had their worn dentition restored put the impact of the condition in context, highlighting that severe tooth wear can be debilitating and dis-figuring to those who have the condition. Everyone in the meeting recognised that it was time for erosive tooth wear to be recorded at every examination and that offering prevention was essential.

Evidence from Europe, Arabia and other regions have shown that prevalence of signs of the condition ranges from 30-60%[1]. Typically, at these levels one surface in the mouth shows sign of erosive damage. A much lower percentage, ranging from 3-4% in less than 30 years old and rising up to 10% in the elderly, have severe tooth wear with multiple teeth involved[1,2]. Whilst the group were aware of the figures the opinion of the patient put into context what the condition means to those affected. A group consensus was reached that to prevent the progression in severity of the condition every examination should include an assessment of tooth wear.

There are a multitude of indices to record tooth wear but one has had more impact over the last few years. The BEWE (Basic Erosive Wear Examination) has gained support from practitioners and researchers and is sufficiently recognised to be the index of choice[3]. It was designed originally for practising dentists, and not researchers, to record erosive tooth wear in a convenient and familiar process. The index was chosen to follow the BPE (Basic Periodontal Examination) where the mouth is divided into sextants. BEWE scoring uses a four point scale (0 = no wear, 1 = early signs, 2 = wear less than 50% and 3 = wear greater than 50%), with each tooth surface examined but only the most severely worn surface recorded in a table. The examination and the recording of BEWE was designed to match the BPE and the team of experts realised both assessments could be done at the same time, so reducing the burden on the dental professional. To overcome the objection of potential increased workload, the decision of the group was to encourage dentists to record the BEWE at the same time as the BPE.

BEWE assesses tooth surfaces within sextants similar to BPE



The evolution of the BEWE stemmed from an international consensus. Many in the UK are more comfortable with the term 'tooth wear' as it is recognised to include erosion, abrasion and attrition. 'Erosive tooth wear' recognises that acid mediated wear is the most common cause, but keeping the words tooth wear within the term means that attrition and abrasion remain. Many are confused and focus on the erosive part but using the term tooth wear emphasises that it is multifactorial. Ultimately, the BEWE records a change in the surface of teeth or shape, irrespective of the cause. So, if the main aetiology of wear is attrition the BEWE can still be used to record in the notes the impact of the change. Therefore, the index provides a code to characterise any change in shape of teeth and is designed to be simple to use.

Raising awareness of a condition is not acceptable if there is nothing that can be done to prevent it deteriorating. The most common risk factor in the progression of erosive tooth wear is diet and probably the most damaging is gastric acids. Everyone enjoys acidic foods and drinks and fruit is part of a healthy diet. We must be careful as a profession not to contradict advice on

consuming more than five portions of fruit and vegetables a day. Our understanding of the risks has become more developed and we now recognise that there is no risk when eating or drinking acidic foods at meal times[4]. But if they are consumed as snacks outside of meals, and for greater than three or four times a day, then the risk increases up to 13 times[4]. In effect, the dietary advice mirrors that for dental caries and sugar, which is to restrict them to meal times. This then fits with the healthy option of eating fruit but qualifies it by emphasising that snacking throughout the day significantly increases the risk of progression.

Gastric acids are strong and, if regurgitated with reflux disease or propelled into the mouth with an eating disorder, there is the potential for demineralisation of teeth. Gastric acid contains hydrochloric acid produced by the parietal cells in the stomach lining and is part of digestion. But if it reaches the mouth the potential for destruction increases. It is a clinical view that they are responsible for the most severe examples of tooth wear and can lead to complete destruction of teeth. If recognised, dentists should alert their medical colleagues and advise the sufferer not to brush their teeth immediately after an episode. There is anecdotal evidence that if sufferers are prescribed medication to control the gastric acids the progression of tooth wear can stop.

There also remains some confusion around the best time to brush teeth, either before or after an acidic food or drink. The concept behind this is that acids are believed to cause demineralisation on the surface of enamel which, provided no further acids are consumed, means that it remineralises and no damage occurs. But if persistent and repeated acid challenges attack the surface the potential for irreversible damage increases. If mechanical wear from brushing, tooth to tooth wear from attrition, or abrasion from the tongue or soft tissues increases, it can lead to loss of tissue and no capacity for repair. Provided repeated exposure of acid does not occur, the surface of enamel remains intact. But once the surface is lost – either through repeated acid exposure or mechanical loss – erosive tooth wear occurs. There is no consensus on whether brushing before or after eating acidic food is more or less damaging but prudent advice would be to avoid brushing after acidic food where possible.

Tooth wear is a common clinical finding, but many dentists do not routinely screen and some don't see it until too late. As a profession, encouraging dentists to screen for periodontal disease led to improved awareness and earlier diagnosis. The group felt it appropriate to recommend that all clinical examinations should include a screen for erosive tooth wear to have a similar effect. In an increasingly litigious society it is prudent to carefully examine teeth, include a screen for tooth wear as a routine and so reduce the risk of missing this common and, for a few, disfiguring condition. Once early signs are identified it is important that advice is given for prevention and diet management and that this is noted for future follow up.

Erosive tooth wear is the third most common condition. It is part of all dental school education and yet within practice it is not routinely examined and recorded. We propose that this cannot continue and as a profession we need to change. Regular and routine screening for erosive tooth wear is essential and our duty to patients.

CPD questions:

1. According to the article what is the level of prevalence for signs of erosive tooth wear?

a. 10-20%
b. 20-40%
c. 30-60%
d. 50-80%

2. What BEWE code would be assigned to a surface with signs of wear of greater than 50%?

a. 3
b. 2
c. 1
d. 0

3. What is the most damaging risk factor in the progression of erosive tooth wear?

a. Diet
b. Dry mouth
c. Gastric acids
d. Sugar

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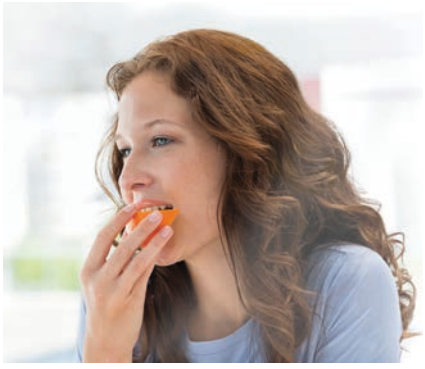

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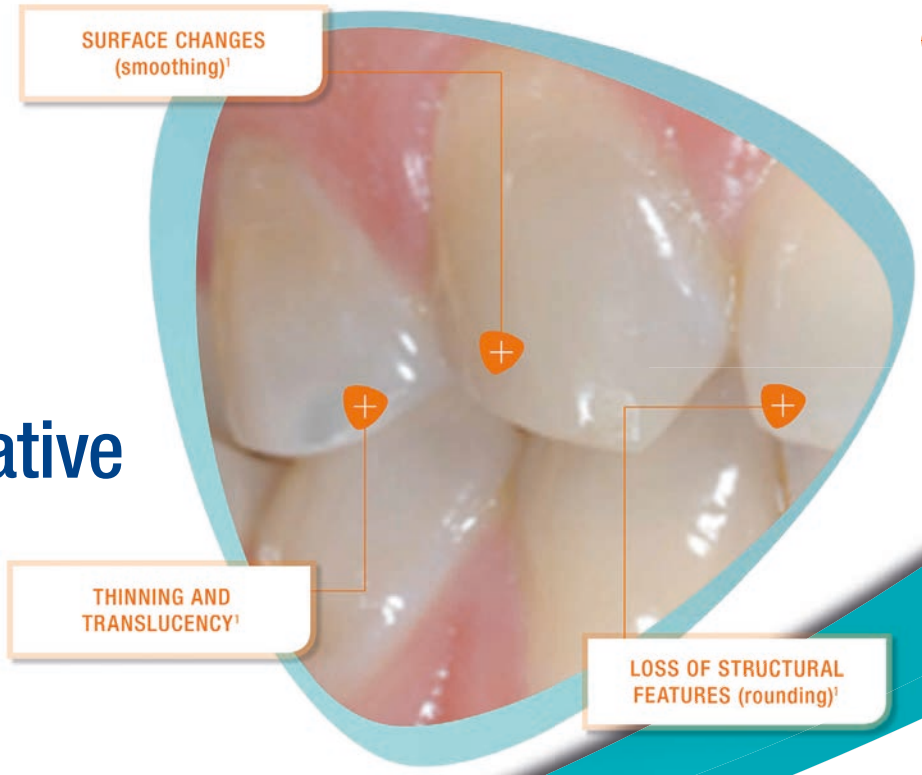
Early detection of acid wear and preventative advice is essential



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