Probiotics NEWS

Specific conditions
- Gingivitis
- Mucositis
- Periodontitis
- Xerostomia
- Halitosis

30-40% of patients with prediabetes develop diabetes 2 within 3.5 years

a probiotic supplement prevents tonsillitis

Oral cavity issues
Our body is a micro cosmos

The oral cavity: Why focus on this particular subject?

What you eat and drink have a double effect on your health

Focus on diabetes
Our body is a micro cosmos

Microbiota is the collective volume of microorganisms living in and on our body.

Only every fourth cell in our body is human! It sounds like the beginning of a science-fiction story, but isn’t. Our body contains 100 trillion (100 x 10^12) micro-organisms, and a further quadrillion (10^15) virus, collectively called microbiota. Beneficial or neutral bacteria are called commensal ("good"), the harmful pathogenic ("bad")

We are fully dependent on the good bacteria. One cannot overestimate the importance of the good bacteria. Without them we simply could not survive. Broadly speaking the microbiota has several important functions. They digest some food components we cannot digest ourselves and synthesize some vitamins (K og B) in the gastro-intestinal canal. The two most important functions are however:

1.) The microbiota is forming a protective layer on our surfaces (mucosa and skin) protecting us from pathogenic bacteria.
2.) The microbiota plays a decisive role in the development and maintenance of our immune system throughout our life.

Everybody knows, that the human cells are organised in different structures with different features and functions. It is however only in recent years, that we have gained insight in the complex structure called biofilm. The biofilm of microorganisms, that live in our body. They too have specialised functions, communicating between species and partly supporting each other. Anaerobic bacteria, for example, live in the centre layer surrounded by aerobic bacteria on each side.

Balance versus unbalance
Balance (homeostasis) means in this case a perfect microbiological balance. The opposite is called unbalance or dysbiosis. Dysbiosis may cause local or systemic diseases. Systemic diseases may be a result of unbalance between the immune system and the microbiota. The unbalance can be caused by effects on either the microbiota and or the immune system, see figure 1. It is a simplified chart, but illustrates the interactions and causes. Our immune system is negatively influenced by smoking, inadequate nourishment, physical

Glossary

Pathogenic: Cause disease

Biofilm: a biofilm is a layered community of microorganisms living in an extra cellular polymere substanse (EPS)

Homeostasis: The perfect balance in microbiota

Dysbiosis: Unbalanced microbiota

Systemic diseases: Diseases affecting the whole body
Probiotics: Bacteria having a positive influence on our health

Prebiotics: Food elements, such as dietary fibers stimulating the positive bacteria in the intestinal canal. The dietary fibers are not digested by our enzymes, but degraded by the good bacteria supplying them with nourishment.

What you eat and drink have a double effect on your health:

Everybody knows how important it is to get nutrients, vitamins, minerals, antioxidants etc for our body. However further to that, our food has an impact through the effect on our bacteria. As an example, a high sugar intake will directly burden our glucose metabolism, but moreover stimulate the growth of bad bacteria in the oral cavity-gastro-intestinal canal. Main rules are:

1. Sugar and high starch products stimulate the growth of bad bacteria in oral cavity-gastro-intestinal canal.
2. Dietary fibers and prebiotic supplements stimulate the growth of good bacteria in the gastro-intestinal canal.
3. Probiotic products and supplements supply good bacteria to the oral cavity and gastro-intestinal canal.

Diseases caused by this unbalance are typically what we call lifestyle diseases, i.e. cardiovascular problems, diabetes, and symptoms like high blood cholesterol, high blood pressure etc. Also chronic diseases such as periodontitis, asthma, gastro-intestinal diseases such as Crohn's disease, irritable bowel disease (IBD), autoimmune diseases like rheumatoid arthritis are linked to this unbalance.

Inactivity, medicine, diseases, stress/sleep deprivation and being overweight.

The microbial balance is negatively influenced by smoking, high sugar intake, medicine, diseases, chemicals in our food (antibiotics and preservatives for example).

Ways to make a positive impact on a dysbiosis are by eating plenty of dietary fibres which has a prebiotic effect. Further ways are consuming probiotic foods and/or probiotic food supplements (as tablets, lozenges or capsules). Examples of probiotic foods are organic unpasteurised yogurt or similar and fermented vegetables.

What is Homeostasis?

Homeostasis is the balance in our immune system that is disturbed by negative influences such as smoking, high sugar intake, medicines, diseases, chemicals traces in food, disease, medicine, anti-bacterial chemicals for example traces in food.

What is Dysbiosis?

Dysbiosis is the unbalance in our immune system that is caused by inactivity, medicine, diseases, stress/sleep deprivation and being overweight. The microbial balance is negatively influenced by smoking, high sugar intake, medicine, diseases, chemicals in our food (antibiotics and preservatives for example).

Ways to make a positive impact on a dysbiosis are by eating plenty of dietary fibres which has a prebiotic effect. Further ways are consuming probiotic foods and/or probiotic food supplements (as tablets, lozenges or capsules). Examples of probiotic foods are organic unpasteurised yogurt or similar and fermented vegetables.
Oral cavity problems: Why focus on this particular subject?

There are several good reasons to focus on the bacterial balance in the oral cavity. First of all, the oral cavity is the natural entrance to the gastro-intestinal canal through where all food and incoming bacteria will pass. The oral cavity has around 700 different species of bacteria and is in fact the location in our body with the largest variety of different species in a small area. Our teeth are the only part of our body surface that is not periodically replaced by new cells. That creates unique growth potential for the biofilm on the surface – and especially the border between teeth and gingiva. Clinically, resulting in caries and gingivitis/periodontitis.

Other reasons to focus on the microbial balance in the oral cavity are, that it is relatively easy to see if it is in balance or not. In practice it also makes sense. If there is a dysbiosis in the oral cavity, it is likely to be the case in the gastro-intestinal canal as well. A well balanced microbiota in the oral cavity is not a guarantee of a well balanced gastro-intestinal canal. However clinically many patients report positive changes to the gastro-intestinal functions when they take oral cavity probiotics.

Lastly, you may also improve your intestinal bacterial balance by taking prebiotics (as food or supplement). It is not possible for the oral cavity though. For that you need an intake of probiotic food or supplements.

Supplements of good bacteria: Probiotics
Almost no one is able to follow a diet that we are genetically evolved to have. Modern food simply contains too much sugar and starch. Even if you avoid candy and sodas, you also have to stay away from most processed food, as it typically contains a lot of sugar to enhance the flavour. Add to this, preservatives and the traces of medicine and pesticides in many food articles. Therefore most people will benefit from a supplement of a probiotics in order to maintain the healthy bacterial balance.

How do probiotics work?
Probiotics have at least three very important effects. First of all they line our mucosa and are part of the first defence against pathogenic micro organisms from the outside. They are effective against pathogenic bacteria passively by taking up space in the biofilm and consuming...
nutrients so there is less nutrient and space for the bad bacteria. Actively, they work by releasing specific and unspecific bacterial toxins killing bad bacteria. The most important role our good bacteria play is however the development and constant stimulation of our immune system. Most people do not realise that without bacteria, we would not develop an efficient immune system.

**Practical application of probiotic supplements**

Dosage is one lozenge per day after brushing teeth and minimum ½ hour before a meal/drink. The price per day is 0.75-0.8 euro. If it exceeds your budget, you may continue on a maintenance supplement of 2-3 lozenges per week after the initial supplement period. In this way you reduce the daily costs to 0.35-0.4 euro. It is not ideal, however much better than no supplement at all.

### Specific conditions where you may benefit from taking a probiotic supplement

<table>
<thead>
<tr>
<th>Condition</th>
<th>Dosage</th>
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<tbody>
<tr>
<td><strong>Bleeding from the gingiva when brushing/flossing.</strong></td>
<td>1 lozenge daily until no bleeding. Then maintenance supplement.</td>
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<tr>
<td>Typical sign of gingivitis</td>
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<tr>
<td><strong>Chronic bad breath (halitosis).</strong> is most often caused by bacteria located in crevices of the tongue’s back part releasing VSC (volatile sulphuric compounds)**</td>
<td>1 lozenge daily until no bad breath. Then maintenance supplement.</td>
</tr>
<tr>
<td><strong>Mucositis</strong> as caused by chemo or radiation therapy of the head-neck region. Pain and discomfort when eating/drinking**</td>
<td>1 lozenge daily until no symptoms. Then maintenance supplement.</td>
</tr>
<tr>
<td><strong>Periodontitis</strong> Enlarged pockets, maybe mobility of teeth. Caused by destruction of periodontal tissues.**</td>
<td>1 lozenge daily as a supplement to a full scale treatment plan designed by your dentist including typically SrP (scaling–root-planning), maybe an antibacterial therapy for pockets, and a supplement of probiotic gel into pockets.</td>
</tr>
<tr>
<td><strong>Dry mouth (xerostomia)</strong> Often a side effect to pharmaceuticals. may cause caries and/or periodontitis.**</td>
<td>Maintenance supplement.</td>
</tr>
<tr>
<td><strong>Oral candidiasis (thrush)</strong> may be caused by antibiotics, chemo treatment or other diseases**</td>
<td>1 lozenge daily until no symptoms. Then maintenance supplement.</td>
</tr>
<tr>
<td><strong>Recurrent caries</strong> indicate that the oral bacteriology is out of balance. Think of diabetes if sudden.**</td>
<td>1 lozenge daily</td>
</tr>
<tr>
<td><strong>Diabetes</strong> may cause caries, gingivitis, periodontitis or periimplantitis**</td>
<td>Maintenance supplement.</td>
</tr>
<tr>
<td><strong>Treatment with antibiotics</strong> For sure a negative impact on the bacterial flora**</td>
<td>1 lozenge daily in 30 days.</td>
</tr>
<tr>
<td><strong>Preparing for surgery?</strong> No matter what oral surgery is happening it is always advised to get the oral micro flora in balance first**</td>
<td>1 lozenge daily in 30 days, begin 2 weeks before surgery if possible</td>
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In this issue we focus on diabetes. This is because the dental team, statistically speaking, meets patients with diabetes, but more importantly also undiagnosed diabetes patients. In the following there are some numbers from the Danish association of diabetics and WHO.

In the EU there are 60 M diagnosed diabetics, or approx. 10% of the population over 25 years. It is estimated, that almost as many are undiagnosed, and up to a further 3 times more have what is called prediabetes. Prediabetes is a reversible condition with increased blood glucose. This means that actual progression into full-scale diabetes may be prevented with change of lifestyle. Without lifestyle change 30-40% of the prediabetics get diabetes within 3.5 years. In the case of developed diabetes, damage to receptors are irreversible, so it is a life long disease.

In diabetes 2 the insulin receptors become less and less sensitive to insulin, which is released from the pancreas. In the beginning the pancreas will compensate and release more insulin, but eventually it cannot cope with the strain. Insulin is necessary for uptake of glucose into fat and muscle cells. When the receptor sensitivity is reduced the blood glucose is increased. This results in increased glucose concentration in all serum products such as gingival crevicular fluid (CGF) and therefore also in dental pockets and the oral cavity as such. The glucose feeds the bacteria, so patients who do not respond as expected on periodontal therapy, or develop sudden caries, should be checked for increased blood glucose.

Diabetes destroys the small blood vessels leading to various organ damages. Diabetes is a significant financial burden in Europe, costing 1-2% of the GDP.

**Focus on diabetes**

30-40% of the prediabetics get diabetes within 3.5 years

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**Brief scientific news on probiotics**

Probiotics prevents tonsillitis in children. In a clinical trial including 60 children suffering from recurrent tonsillitis, one group of 30 children had a daily supplement of a lozenge with probiotic for three months, and the other group serve as the control.

If the children during this period had signs of infection they were tested for streptococcus and treated with conventional antibiotics if positive.

In the same period (February- April) the previous year the two groups had respectively 94 and 90 episodes of tonsillitis (i.e. approx 3 episodes per child). In the probiotic group the episodes fell to 6 versus 84 in the control group. When measuring absence from pre-school/school due to infections there was also a high significant difference with 16 days in the probiotic group versus 228 in the control group.

Visit www.cmsdental.com for more details.

Help the good bacteria win the battle