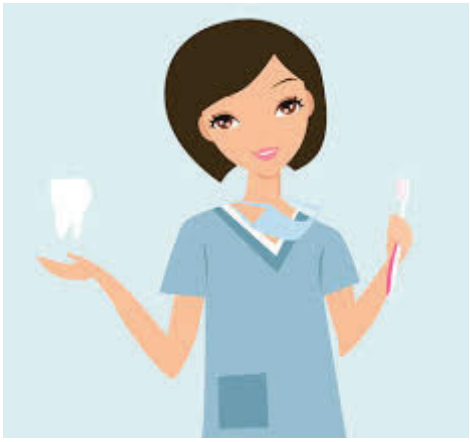
PERIO-ANALYSE
for
DENTISTS & HYGIENISTS



How to prevent and cure periodontal disease and peri-implantitis using PERIO-ANALYSE Testing

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Periodontal bacteria identity and associated risks

The origin of periodontal disease is the formation of bacterial biofilm with specific pathogenic bacteria. The pathogenic bacteria are also present in the saliva of patients. The colonization of the mouth by periodontal bacteria can take place at an early age of the patient but can also take place after dental implant installation (peri-implantitis) if the patient was not being properly treated against pathogenic bacteria or having poor oral hygiene.

- ✓ **The non-existence in the oral cavity of a certain pathogenic bacteria strain will guarantee the absence of periodontal disease or peri-implantitis.**

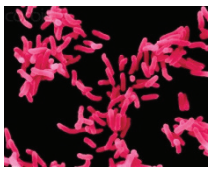
- ✓ **The presence of certain pathogenic bacteria strains and fungus at a certain level will increase the risk of periodontal disease or peri-implantitis.**

List of pathogenic bacteria strains and fungus associated with risk of periodontal disease or peri-implantitis is:

- ***Aggregatibacter actinomycetemcomitans***
- ***Porphyromonas gingivalis***
- ***Tannerella forsythensis***
- ***Treponema denticola***
- ***Prevotella intermedia***
- ***Peptostreptococcus micros***
- ***Fusobacterium nucleatum***
- ***Campylobacter rectus***
- ***Eikenella corrodens***
- ***Candida albicans***

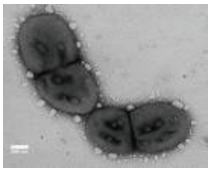
A great number of periodontal disease cases can be treated and maintained under control for many years by dental hygienists according to the traditional process of surgical mechanical actions, such as radicular surfacing and under-gingival descaling associated with hygiene protocol and some antibiotics. The choice of the therapy depends on the composition of the sub-gingival microflora. **An antibiotic therapy** can be prescribed only in combination with a meticulous cleaning of the pockets by surgery. Certain aggressive, anaerobic pathogenic bacteria are inside the soft tissue (intracellular) and require **surgical procedure** to eliminate contaminated soft and hard tissue. The most aggressive pathogenic bacteria strains, to be at high risk for rapid bone destruction and need specific treatment by a specialized dentist, are:

- ***Aggregatibacter actinomycetemcomitans***



A.a. is sensitive to New Quinolone and Tetracycline, but is practically insensitive to Metronidazol. There is a strong relation with the youthful periodontitis (very high).
Bone lost could be more than **3 mm in 2 months with only 10^5 bacteria** into the pocket (Haffajee 1994).
Antibiotics are always necessary and surgical plasty could be recommended in some cases to eliminate soft tissue. A.a. is transmissible in particular between parents and children.

- ***Porphyromonas gingivalis (if present at a certain quantity)***



Porphyromonas is sensitive to Tetracycline and Penicillin.
Bone lost could be more than **2mm in 2 months with only 10^5 bacteria** into the pocket (Haffajee 1994).
P.g. is transmissible between parents and children and between partners.

Periodontal disease antibiotic therapy has to be prescribed only after microbiological analysis to identify and quantify the exact bacteria present in the sulcus and decide the efficient antibiotic, reduce antibiotic resistance and treatment failure.

The success of the long-term treatment is assured only if the patient practices good oral hygiene and follows a monitoring program organized by dentists and hygienists with regular Perio-Analyse controls. Patient suffering from periodontal disease are at risk of new bacterial infection around the dental implant (called peri-implantitis). Peri-implantitis (osseous loss is higher or equal to 1.8 mm after one year and associated with a bleeding and/or a suppuration) increase at 16% of the patients and around 6.6% of the implants. The microbial colonization associated with peri-implantitis is similar to bacteria identified during periodontal disease however high level of some bacteria seems more associated with peri-implantitis.

Moreover, some fungus, like *Candida albicans*, have been recovered from periodontal pockets in 7.1 to 19.6% of patients with chronic periodontal disease and are a cause of resistance to treatment. *Candida albicans* has also been isolated from periodontal pockets in HIV-positive and diabetic patients.*Candida albicans* can also be associated with peri-implantitis infections. *Candida albicans* can also be associated with peri-implantitis infection. Antibiotics are not efficient against fungus and local treatment needs to be proposed. Antifungal treatment could be Nystatin, Amphothericin, Miconazol or fluconazole, having local effects.

It is important in daily clinical practice to evaluate the biological risk before placing the implants, and supervising the patients after treatment to detect early signs of peri-implantitis infection. The early detection of signs of bacterial risk, the reinforcement of measurements of oral hygiene and the treatments will be able to reduce the bacterial loads and prevent peri-implantitis.

Technical recommendations and objectives:

It is advised to carry out an analysis in the following situations:

- first visit
- patients with periodontal disease risk or gingivitis
- patients who smoke
- diabetic patients
- periodontal disease with depth of the pockets >4mm (in spite of a very good oral hygiene)
- aggressive or progressive periodontal disease
- refractory periodontal disease resistant to the therapy
- periodontal disease evolving/moving quickly
- peri-implantitis risk patient
- 3 months after periodontal treatment starting date
- every 6 months for patients with high risk
- every year for all patients.

The objectives of the analysis:

- choice of a suitable antibiotic and treatment in relation with bacterial strain identity
- follow-up of treatment and evaluation of success or failure
- early detection of the secondary infection
- motivation of patient to maintain their treatment and their oral hygiene in the long run.

Pathogenic Threshold

Periodontal pathogens are presented schematically within microbiological complexes (Socransky et al., 1998).

Complex of Socransky	Periodontal pathogens	Abbreviation	Threshold of pathogenicity requiring the use of a antibiotic adapted in addition to one mechanical action
Aa	*Aggregatibacter actinomycetemcomitans*	**Aa**	$>10^3$ CFU
Red complex	*Porphymonas gingivalis* *Tannerella forsythensis* *Treponema denticola*	Pg Tf Td	$>10^5$ CFU $>10^5$ CFU $>10^5$ CFU
Orange complex	*Prevotella intermedia* *Peptostreptococcus micro*	Pi Pm	$>10^5$ CFU $>10^6$ CFU
Complex Orange Associated	*Campylobacter rectus*	Cr	$>10^6$ CFU

The PCR microbiological analysis gives a value of quantification (equivalent CFU by sample) of each periodontopathogen as well as the percentage of each bacterial type compared to the total flora.

References: scientific publications could be provided to dentists under specific demand by email. Please contact info@institut-clinident.com or the institute clinident webpages (www.institut-clinident.com) and ask for publications.

Perio-Analyse support

The possible situations are presented schematically within microbiological complexes presence or absence into saliva or pocket.

Tested matrice	*Results*	*Recommendations*
saliva	*presence of pathogenic bacteria without Aa and/or Pg*	-control all dental pocket, depth, radicular surfacing -under-gingival descaling -hygiene protocol
saliva	*presence of Aa and/or Pg*	-control all dental pockets, depth, and use Perio-analyse for each dental pocket with more than 4 mm -follow dental pocket Perio-analyse recommendations with the new results
dental pocket	*presence of pathogenic bacteria under the threshold*	-radicular surfacing -under-gingival descaling -hygiene protocol -no need an antibiotic
dental pocket	*presence of Aa over the threshold associated or not with other pathogenic bacteria over the threshold*	-radicular surfacing -under-gingival descaling -hygiene protocol -possible bone surgery with/or no flap -tetracycline could be recommended

FAQ

Why not only collecting the saliva?
- **Because the presence of periodontal bacteria into the saliva is a risk factor, but not a diagnosis.**
- **Only presence of non balanced microflora in the sulcus could be considered as a diagnosis tool and should be treated.**

Which are bacterias at high risk for rapid bone lost?
- **Aa and Pg.**

Why is Aa associated with strong surgery/mecanical treatment with flap?
- **Aa is intracellular bacteria and could also survive in presence of oxygen after surgery.**

Why Candida albicans could be at risk?
- **Because in presence of antibiotic and after bacteria reduction and limited competition, Ca can grow and fully colonize the sulcus.**

What are the unit use for bacteria load?
- **10 000 = 10^4 = E+04 = 10 000 bacterias in the tested sulcus.**

What is PCR?
- **PCR is amplification of specific zone of the DNA (Polymerase Chain Reaction)**
- **Each amplified zone is specific from a bacteria species**
- **PCR process takes about 6 hours.**

When should I test for the second time?
- **3 months after the first sampling and antibiotic use.**

Antibiotic recommendation?
- **Aa alone or with red complex = tetracycline**
- **Red complex > the threshold = penicillin**
- **Red complex + Pi > the threshold or Pi alone = metronidazole.**

May I use probiotics?
- **Yes after perio treatment, probiotics will assure a microbial competition and reduce the risk of new infection.**

How many paper points should I use?
- **Minimum 2 per site. 10 paper points for a pool sample (for representativity).**

How long is stable DNA on paper point at room temperature?
- **> 2 weeks.**

What at are the DNA target and DNA standard of the PCR developed by Institut Clinident?
- **Ribosomal 16S DNA sequences**
- **Qualibrated DNA from DSMZ (Germany) and Institut Pasteur (France).**