ALERT2™

FINAL REPORT

ORALDNA LABS™ Innovations in Salivary Diagnostics

Sample, Report

Date Of Birth: 09/20/1970(47 yrs)
Gender: Female
Patient Id:789
Patient Location:Test Location A

Ordering Provider

Ronald McGlennen MD
7400 Flying Cloud Drive
Eden Prairie, MN 55344
855-672-5362

Sample Information

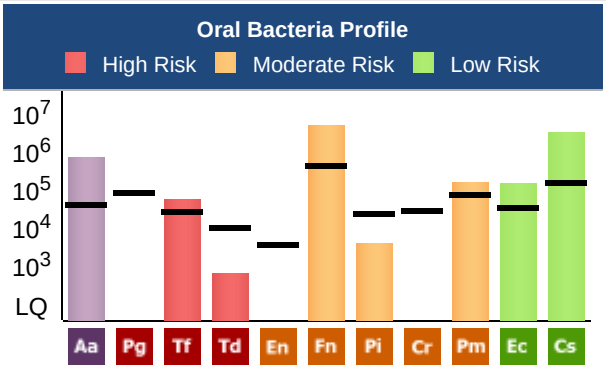
Specimen#: 5033032170
Accession#: 201807-12481
Specimen: Oral Rinse(P)

Collected: 07/17/2018
Received: 07/18/2018 10:28
Reported: 07/19/2018 14:00

SUMMARY OF TEST RESULTS

MyPerioPath®

- The MyPerioPath® test measures 11 types of bacteria known to cause periodontitis (gum disease) and increased risk for cardiovascular disease. These bacteria are also associated with diabetes, adverse pregnancy outcomes, rheumatoid arthritis, and other systemic illnesses.
- 8 of the 11 bacteria types were detected in the submitted sample. 6 of these are above the treatment threshold level.
- The levels of Aa are of particular concern. This bacterial type is associated with an earlier age of onset, and an aggressive clinical course.



MyPerioID® IL-6

- The MyPerioID® test determines the nucleotide sequence at one region of the Interleukin 6 gene, a key marker of a person's immune system and inflammation response.
- Your test result shows a G/G genotype, which is categorized as high risk for periodontal inflammation.
- This result implies a greater lifetime risk of chronic periodontitis, and for other conditions such as heart disease, arthritis, diabetes and some cancers.

Gene Marker	Risk Category
Interleukin 6	HIGH

Integrative Summary / Treatment Considerations

- The combination of these two test results show the signs of an existing or emerging periodontal infection and the likelihood of a heightened or increased inflammatory response to those high and moderate risk bacteria.
- Based on these test results, we recommend that you seek dental consultation and treatment.
- Your treatment options include various approaches to remove plaque above and below the gumline using scaling and root planing or lasers, and the selective use of tray delivery systems for disinfectants or local and systemic use of antibiotics.
- A follow-up test is recommended to monitor the effectiveness of current treatments and to determine the type and frequency of future care.

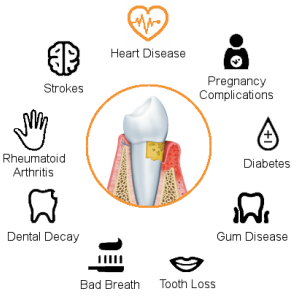
Discover the Facts...

what you may not know about oral bacteria and how it relates to overall health

A heart attack is triggered by the blockage of one of the arteries that supply the heart muscle with oxygen rich blood. Occlusion of the coronary arteries are now known to be caused not only by deposition of bad cholesterol, but by the migration and entrapment of oral bacteria, such as Porphyromonas gingivalis, or Pg. In a recent review article by Drs. Brad Bale and Amy Doneen, they describe how oral bacteria can no longer be viewed as associated with heart attacks, but as a cause.

Bale, BF, Doneen, A L, Vigerust, DJ. High-risk periodontal pathogens contribute to the pathogenesis of atherosclerosis Postgrad Med J. 2017 Apr;93(1098):215-220.

Learn more by visiting www.oraldna.com



MYPERIOPATH®

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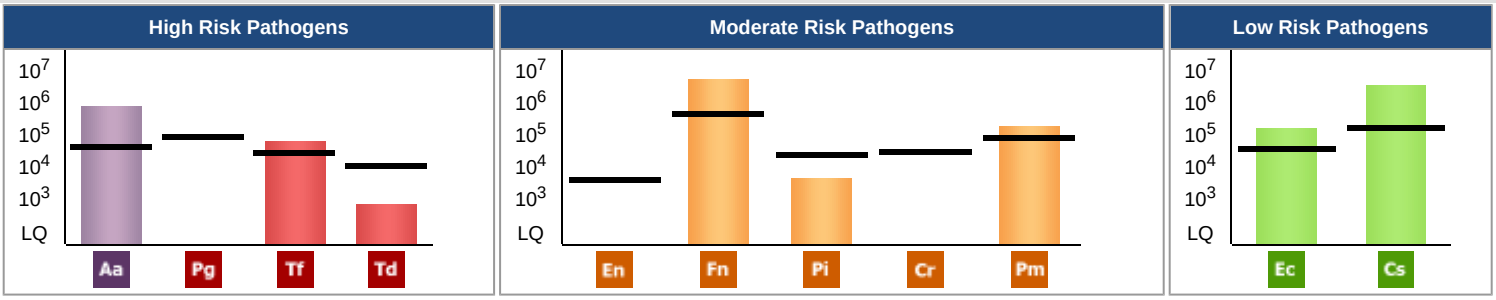
MYPERIOPATH MOLECULAR ANALYSIS OF PERIODONTAL AND SYSTEMIC PATHOGENS

Results



Legend: The result graphic (above) shows the bacterial level for each of the assayed species. The vertical axis displays bacterial genome copies/milliliter in log10. The limit of quantification (LQ) is the lowest bacteria level that can be repeatedly measured. The black lines across each colored bar are the Therapeutic Threshold.

Interpretation of Results

- This result shows 2 high risk (Aa, Tf) and 2 moderate risk (Pm, Fn) pathogens above the therapeutic threshold. High levels of Ec, Cs are frequently part of this complex bacterial profile.
- The bacterial species Tf and/or Aa are strongly associated with chronic periodontitis, are transmissible and tissue invasive even at low amounts of these organisms. Moreover, Aa is pathogenic due to virulence factors that the organism expresses, resulting in inflammation that leads to tissue destruction. Note: the bacterial species Pm is commonly resistant to various treatments, and may be a reservoir of antibiotic resistance.
- The detected pathogens are also risk factors for various systemic diseases, including atherosclerosis, type 2 diabetes, arthritis, dementia and several types of cancer. Importantly, Fn is associated with a specific type of colon cancer, where the bacteria can affect how aggressive that disease is, and its response to treatment.

Treatment Considerations: to be determined by the healthcare professional

- **Mechanical/Debridement:** Scaling and root planing (SRP) is a mainstay of therapy to disrupt biofilm, remove plaque and debride compromised tissue. This patient harbors a series of pathogens (Aa, Tf, Pi, Pm) that may be refractory to this treatment.
- **Systemic Antibiotics:** This patient has indicated no allergies.

  Rx Amoxicillin 500 mg tid for 8-10 days AND Metronidazole 500 mg bid for 8-10 days
  As always, use antibiotics with care

- **Local Antibiotics and Chemical Hygiene:** As an adjunct to SRP, sub-antimicrobial doses of doxycycline hyclate lower collagenase activity and reduce periodontal pocket depth. Alternatively, locally delivered antimicrobial agents (LDA) including minocycline microspheres, doxycycline hyclate in an absorbable polymer, or chlorhexidine in a gelatin matrix have been shown to decrease pocket depth modestly.
- **Pocket or Field Decontamination:** Laser decontamination as an adjunct therapy to SRP may be beneficial in reducing probing depth and bacterial loads. The consideration of using lasers as an adjunct to SRP is dependent on type of laser used and the particular protocol.
- **Chemical and Gaseous antiseptics:** Chlorhexidine or Povidine iodine rinses can reduce periodontal pocket depth. Prescription tray application of peroxide gel, as an adjunct to frequent periodontal maintenance appointments for refractory patients, demonstrated significant reductions in bleeding on probing. Ozone is a volatile antiseptic that can disrupt microbial membranes.
- **Probiotics and Prebiotics:** Probiotics are live, beneficial bacteria, typically administered as a food or dietary supplement. Prebiotics are non-digestible ingredients that promote growth of commensal bacteria. Research shows that prebiotics and probiotics control the growth of pathogens and reverse tissue destruction caused by periodontitis.
- **Periodontal Surgery:** For severe and/or refractory periodontitis - surgical approaches such as gum flap repairs, procedures to reduce pocket depth, or other restorative procedures may be indicated.

Follow up Recommendations

- ☑ Good periodontal health depends on compliance of a home care regimen as detailed by your healthcare provider. Daily brushing, flossing, as well as attention to nutrition, proper rest and cessation of smoking are essential.
- ☑ Follow-up testing between 6-12 weeks with MyPerioPath is recommended. Persistence of bleeding on probing is often indicative of unresolved infection. Retesting will identify residual or refractory bacteria. Currently there is not a cure for periodontal disease, only periods of remission.
- ☑ Assessment of a patient's level of inflammation with Celsus One is valuable in deciding the frequency of patient recall and treatment.

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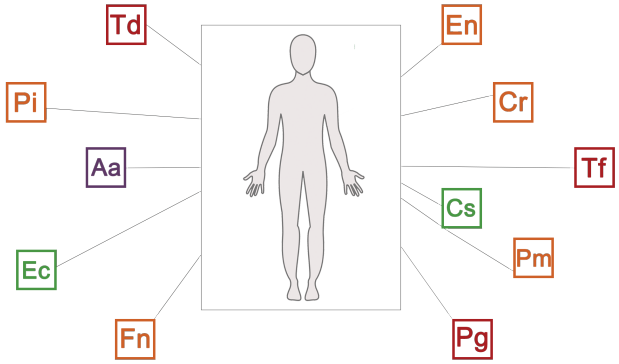
Clinical Considerations

Reason for Testing	Clinical	Diagnostic	Medical History
☑ Not Provided	☑ Generalized Infection ☑ Inflammation/Redness	☑ Type III Moderate Periodontitis ☑ Tooth Numbers 3 | 9 | 14 | 19 | 24 | 30 Pocket Depths(mm) 4 | 4 | 5 | 4 | 4 | 3	☑ Past History of Smoking ☑ Cardiovascular Disease ☑ Diabetes

Systemic Effects of Oral Pathogens



Cancer

Chronic gum disease, involving Aa, Pg, Td, Tf, & Fn is a risk factor for the development of certain cancers including ones involving the pancreas, esophagus, colon, lungs, and the head and neck. Additionally, untreated gum disease is a cause of ongoing inflammation, which may promote the advancing growth of tumors.

Cardiovascular Health

Select bacteria such as Aa, Td, Tf, Pg, Pi, & Fn can leak from blood vessels in the gums and travel to the heart, where cholesterol and other lipids deposit. These bacteria can incite inflammation in arteries, and if occluded, cause a heart attack. A goal of treatment is to minimize the levels of these bacteria as much and as long as possible.

Joint and Musculoskeletal Health

The periodontal bacteria Pg, Fn & Ec are a cause of arthritis. The oral inflammation caused by these bacteria also leads to total body inflammation which, combined with changes in a person's immunity, may result in chronic joint diseases like rheumatoid arthritis.

Dementia and Brain Health

Recent medical studies point to poor oral health, and high levels of the bacteria Pg, Cr, Cs in our gums, increasing the risk of developing dementias such as Alzheimer's.

Metabolic Health

Obesity, lack of exercise and chronic gum disease involving the bacteria Aa, Td, Tf, Pg, & Fn cause chronic inflammation. Inflammation can damage the pancreas where insulin is produced, possibly leading to diabetes. Also, diabetes worsens oral health by increasing the level of harmful bacteria in the gums.

Healthy Pregnancy

Bacteria associated with gum disease, especially Aa, Tf, Pg, Fn, and Ec, are known to put a pregnancy at risk for pre-term birth, decreased birth weight and even blood infection in the placenta or newborn. Every pregnant woman should be tested for these harmful bacteria.

Methodology: Genomic DNA is extracted from the submitted sample and tested for 10 species-specific bacteria [Aa: Aggregatibacter actinomycetemcomitans, Pg: Porphyromonas gingivalis, Tf: Tannerella forsythia, Td: Treponema denticola, En: Eubacterium nodatum, Fn: Fusobacterium nucleatum/periodontium, Pi: Prevotella intermedia, Cr: Campylobacter rectus, Pm: Peptostreptococcus (Micromonas) micros, Ec: Eikenella corrodens] and 1 genus of bacteria [Cs: Capnocytophaga species (gingavalis, ochracea, sputigena)] known to cause periodontal disease. The bacteria are assayed by real-time quantitative polymerase chain reaction (qPCR). Bacterial levels are reported in log 10 copies per mL of sample (e.g. 1x10^3 = 1000 bacteria copies per mL of collection). Cross-reactivity is possible with Leptotrichia buccalis, Fusobacterium hwasooki, Capnocytophaga granulosa and Capnocytophaga leadbetteri. This test was developed, and its performance characteristics determined by OralDNA Labs pursuant to CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary.

Ronald McGlennen MD, FCAP, FACMG, ABMG
Medical Director

MYPERIOID®

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Reason for Testing: Evaluation of Systemic Disease
Related info: Not Provided
Patient History: Not Provided

MOLECULAR DETECTION OF IL-6 PERIODONTAL RISK FACTORS

Genotype	Risk
G/G	HIGH

Interpretation:

This individual's interleukin 6 genotype (IL6) is G/G. This MyPerioID result indicates your patient has a high risk for periodontal inflammation due to the genetic variation examined in this test.

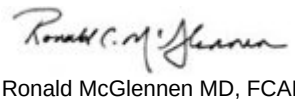
Comments:

- Significance: The prevalence of the G/G genotype is reported to be higher in individuals with moderate to severe chronic periodontitis and aggressive periodontitis than in individuals with no periodontal disease. This finding was independent of other risk factors such as age, smoking, ethnic origin. The 'G' allele is associated with overproduction of interleukin-6 (IL-6) cytokine in the presence of pathogenic periodontal bacteria.

- Risk: Individuals carrying an IL6 G allele are associated with increased odds of the concomitant detection of A. actinomycetemcomitans, P. gingivalis and T. forsynthensis.

- Consider: IL-6 is a potent stimulator of osteoclast differentiation and bone resorption, is an inhibitor of bone formation, and overproduction has been implicated in systemic diseases such as juvenile chronic arthritis, rheumatoid arthritis, osteoporosis, Paget's disease and Sjogren's syndrome. The MyPerioID test assesses one of several risk factors that should be included in an overall evaluation of periodontal disease. Specific bacteria are associated with the initiation of the periodontal disease. Additional risk factors including other genetic markers, smoking, diabetes, and oral hygiene have an amplifying effect on disease progression and duration. The incidence of IL6 genotypes is reported to vary by ethnicity. Additional testing, such as MyPerioPath, may be considered if not already performed.

Methodology: Genomic DNA is extracted and tested for the interleukin 6 genetic variation located at position -174 (rs1800795). This genetic variation is tested by methods of the polymerase chain reaction, endonuclease digestion and resultant restriction fragment detection by automated microcapillary electrophoresis.
Disclaimer: The reported genotypes are a subset of the group of genes that comprise the complete immune system. This genetic analysis may not detect specific immunologic diseases or predict the health and effectiveness of a person's immunity for specific diseases. Such an evaluation may require genetic counseling and testing directed to characterize those genetic conditions. This test was developed and its performance characteristics determined by OralDNA Labs. It has not been cleared or approved by the US Food and Drug Administration.



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