Periodontal Microbiome Working Group

GENETICS

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\downarrow \quad \text{Response to meds} \\
\text{Dental Analgesics} \\
\text{Anti-coagulants}
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\downarrow \quad \text{Diet} \leftrightarrow \text{Microbiome}
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ENVIRONMENT

COMPLEX DISEASE

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\text{CAD? T2D}
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Goal: To establish an Oral/Systemic Health Research Network

Aim: Share/pool patients and data across network to advance Translational Medicine and Dental Care

Process: Institute standards and best practices
Periodontal Microbiome Working Group

Progress to date

Two teleconferences: January 25\textsuperscript{th} and February 24\textsuperscript{th}, 2012

Reps: Geisinger Health System
Morehouse School of Medicine
Mount Sinai School of Medicine
National Human Genome Research Institute
Ohio State University Medical Center
University of Medicine and Dentistry of New Jersey
University of North Carolina
University of Pennsylvania
University of Pittsburgh
University of Illinois at Chicago
• Inclusion/Exclusion criteria
• Expected sample size
• Periodontitis case definition
• Types of oral samples to be collected
• Number of oral samples to be collected per patient
• Timing of collection of samples
• Ability to follow-up patient after initial sample collection
• Method for identifying microbial species present in the oral samples
• Method for collection of oral samples
• Method for extraction of nucleic acids from oral microbiome samples
• Other types of biological samples to be collected
• Other primary phenotypes of interest
• Methods for determining other primary phenotypes
Inclusion/Exclusion criteria

- Age ≥45 years
- Place of residence ≤60 miles from the dental clinic
- No routine dental visit for cleaning and examination in the past 365 days
- Has at least 1 each of incisors, cuspids, and bicuspids, and 2 molars on each side of the mouth
- Has used Marshfield Clinic as the system of care at least once during the past 3 years and has a primary care provider within Marshfield Clinic
- No antibiotic treatment in the past 3 months
Periodontitis case definition

CDC/American Academy of Periodontology case classification system; these two organizations participated in a working group that developed case definitions for use in population-based surveillance of periodontitis.
Present studies (observational) to date support 
association with Atherosclerotic Vascular Disease, 
but does NOT support a causal relationship.

Does not take into account microbiome variation

However, Short term PD Rx does lead to:
1) Decreased systemic inflammation
2) Decreased endothelial dysfunction
Diabetes and periodontal diseases: interplay and links
Lakschevitz et al., Curr Diabetes Rev, 2011

Present studies (observational) to date support association with Atherosclerotic Vascular Disease, and supports a bidirectional causal relationship.

Treatment of PD benefits metabolic control in T2D pts.
Demonstration Project:
Management of Patients with Diabetes & Periodontitis

We have 47,247 unique patients with both dental and medical data within the Integrated Medical-Dental Data Warehouse.

- **8851** moderate to severe periodontal disease within 47,247 unique patients
- A total of **2752** diabetic patients within this group who had visited a medical provider within the last three years.
  - **1858** Diabetics have had a dental visit in the last 1 year, however **894** diabetics have not had a dental visit within the last 1 year
Management of Patients with Diabetes & Periodontitis

CDS tools within the iEHR to support cross disciplinary care management
Demonstration Project:  
PGx - Dental Patients

Pain management

Coagulation management

PGx panel for dental patients

CDS tools – tailored to Dental Meds in iEHR
INVITED MEDICAL REVIEW

The oral-systemic personalized medicine model at Marshfield Clinic

I Glurich¹, A Acharya²*, SK Shukla³, GR Nycz⁴, MH Brilliant³

¹Office of Scientific Writing and Publication, Marshfield, WI, ²Biomedical Informatics Research Center, Marshfield, WI, ³Center for Human Genetics, Marshfield Clinic Research Foundation, Marshfield, WI; ⁴Family Health Center, Marshfield Clinic, Marshfield, WI, USA

Genome technologies and personalized dental medicine

G. Eng, A. Chen, T. Vess, GS Ginsburg
Institute for Genome Sciences & Policy, Duke University, Durham, NC 27708, USA.
Oral Diseases 2012
NIDCR just awarded a $66.8 million, seven-year grant towards a National Dental Practice Based Research Network (NDPBRN) to Dr. Greg Gilbert at University of Alabama at Birmingham School of Dentistry.

Marshfield Clinic supported this application and will join the NDPBRN (Midwest Regional Node).

We will continue efforts to form a national network of like-minded institutions across the country to establish a large and diverse cohort of dental/medical patients with EHRs, EDRs and oral microbiome samples.

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