Taking Periodontal Care from Good to Great
Presented by: Carol A. Jahn, RDH, MS, Senior Professional Relations Manager, Water Pik, Inc
cjahn@waterpik.com

Disclosure Statement
Water Pik, Inc: Designed and developed this course/Manufactures and distributes products addressed in this course/Provided an educational grant to support this course
Carol A. Jahn, RDH, MS Is employed by Water Pik, Inc as the Senior Professional Relations Manager/Serves on the board of the RDH Magazine, Access Industry Board, and the corporate council for Dimensions of Dental Hygiene

Comprehensive Periodontal Therapy, American Academy of Periodontology, 2010
“As a result of advances in knowledge and therapy, the majority of patients can retain their dentition over their lifetime with treatment, reasonable plaque/biofilm control.”

Periodontology 2000, 2011
Research over the last 20 years has demonstrated that susceptibility, extent, and severity of periodontal disease are influenced by multiple factors.

Definition of Best Practice from ADHA:
The most efficient (least amount of effort) and effective (best results) way of accomplishing a task, based on repeatable procedures that have proven themselves over time for large numbers of people.

New York Times, Jan 3, 2010
As the brain crosses through middle-age, it gets better at recognized the ‘big picture’. If the brain is good shape, it can continue to build pathways that help recognize patterns that in turn may help middle-agers see significance and solutions faster than a younger person.

Periodontology 2000, 2005
Formation: attachment, secretion of sticky matrix, maturation & growth.
Structure: surface needed for attachment, biofilm community, bulk fluid

Periodontology 2000, 2011
Emerging research on biofilm shows that the bacteria within a biofilm may exhibit ‘functional heterogeneity’; exhibit metabolic and phenotypic
Dysbiosis: Decrease in the number of beneficial bacterial/increase in the number of pathogens

Annals of Periodontology, 1998
In patients with moderate to severe periodontal disease, the total area of pocket epithelium in direct contact with subgingival biofilm may be about the size of the palm of a human hand
People with severe periodontal disease have higher levels of IL-1ß in all probing areas including shallow pockets

J Periodontology, Nov, 2005
Low organisms/low antibodies:, healthy, never smoked, not obese, diabetic or hypertensive
Low organisms/high antibodies: early perio, former smokers, male, over 65, thick carotid arteries, history of CVD
High organisms/low antibodies: severe perio, female, under 65, current smoker, little history of CVD
High organisms/high antibodies: severe perio, hypertensive, obese, diabetic

Journal Periodontology, 2000
Study in twins found about 50% of susceptibility to periodontal disease is due to genetic factors
Journal of Periodontology, 1994
Determination of risk: Identification of factors associated with disease, distinguish between high and low risk, assessing a population for a risk factor, applying a targeted intervention or treatment to those at risk to determine effectiveness
Casual vs Causal: strength, specificity, degree of expose/dose response, consistency, temporarity, plausibility

Centers for Disease Control, 2010 & 2011
3M fewer smokers than in 2005, but 45M still smoke/changes in cigarette make it more difficult to quite
Smoking is the leading cause of preventable death.
Major risk factor for oral and pharyngeal cancer
The number one risk factor for heart disease and stroke/A factor in premature birth and low birth weight/May be associated with other health risk behaviors /Alcohol, drugs, high risk sex
Second hand smoke: 53.6% of children ages 3-11 years were exposed to 2nd hand smoke between 2007/08
18.2% live with a someone who smokes inside the home/98% of those who live with a smoker have measureable levels of toxic chemicals in their blood stream/Clinicians should routinely ask about 2nd hand smoke exposure/Can cause premature death and disease in non smoking children and adults/Increases a child’s risk for SIDS, acute respiratory infections, ear problems, asthma/21% more likely to have high blood pressure

Journal of Periodontology, 2004
Approximately ½ of all cases of PD are attributed to smoking/41.9% for current & 10.9% for former/Strong dose response relationship between amount smoked and disease severity/Young adult smokers (19-30 y/o) have a higher prevalence and severity of PD
Clinical Findings in Smokers: More calculus/Less inflammation/Similar plaque levels/Higher number of furcations/Deeper probing depths/Greater attachment loss/Greater tooth loss/Effects are most marked in maxillary lingual and mandibular lower anteriors suggesting a local effect
Smoking: Response to Therapy: Smoking compromises probing depth and attachment level gains/Improvements are ~50% less/Detrimental to regenerative therapy in interproximal & furcation defects/Significantly associated with implant failure

Passive Smoking & Dental Caries, JAMA, 2003
Dose response relationship between deciduous caries and 2nd hand smoke/American J of Public Health, 2011
People exposed to 2nd hand smoke for 25 hours or less per week had a 29% increased risk for perio/exposure to 26+

Data from the National Health Interview Survey, 2008; Released by CDC, Feb 2012
Current smokers 2x as likely as former smokers and 4x as likely as never smokers to have periodontal disease
More likely to have 3+ oral health problems, more likely to have not seen a DDS. Couldn’t afford primary reason.

Spit Tobacco Addition, Feb 9, 2010
Nicotine dependence symptoms are found more frequently in exclusive spit tobacco users versus cigarette smokers
2 to 5 time more likely to experience withdrawal symptoms/Report fewer quit attempts

www.tobaccofreekids.org
Spit tobacco users: 60-78% have a leukoplakia/80%higher risk of oral cancer/60% higher risk for esophageal & pancreatic cancer/24,100 cases will be in men and 10,200 in women/Average age of diagnosis is 62/One third now occur in those under age 55/15% also have tumors in the larynx, esophagus or lung at the time of diagnosis/Survival rate for stage IV – 30-48%/Of those cured, 10-40% will develop another cancer later

American Cancer Society, 2011
9 out 10 use tobacco/7 out 10 are heavy alcohol drinkers
Heavy drinkers and smokers may have a 100 fold increase in risk of developing this type of cancers
HPV: Factor in about 25% of oral cancers, particularly in younger individuals/affects the tonsils in 50% of cases/ Caused by HPV 16 - the same virus that is found in cervical cancer/ HPV-related oral cancer seems to have a better outcome than that caused by tobacco or alcohol

Oral HPV Strikes Men more than Women/ Highest rates are in 30-34 y/o (7.3%) & 60-64 y/o (11.4%)

Smoking is believed to raise the odds of an HPV infection possibly by suppressive effects on the immune system or damaging the mucosal lining of the mouth/ Heavy drinking, marijuana use and sexual behavior increased the risk

Oral cancer is often diagnosed late and has often metastasized/ Major factor in the high death rate

In early stages may not be noticed by the patient because it doesn’t produce pain or symptoms

Leukoplakia: 25% are cancerous or precancerous/ Erythroplakia: 7 in 10 are cancerous or precancerous

Periodontal disease and overall health: A clinicians guide: 2010

“Diabetes is an established risk factor for periodontitis and is the only disease that has been shown to independently and significantly increase the risk for periodontitis”

Agency for Healthcare Research & Quality, Jan 5, 2011/ Centers for Disease Control, Dec 2010

The number of American treated for diabetes more than doubled between 1996 & 2007

Obesity is rising across all income and educational levels and these rates are linked to the rising rates of diabetes

60% of adults are not sufficiently active to achieve health benefits.

American Diabetes Association, 2011

Affects 25.8 M/ 7M undiagnosed/ 79M have prediabetes

US Dept of Health and Human Services, 2011

Obese individuals have a 50-100% increase of premature death from all causes/ High blood pressure is twice as common/ A weight gain of 11 – 18 lbs makes a person 2 x as likely as a normal weight person to develop type 2 diabetes/ Women gaining more than 20 lbs from age 18 to midlife double their risk of postmenopausal breast cancer/ Sleep apnea and asthma are more common/ For every 2 pound increase in weight, the risk of developing arthritis is increased by 9-13%

Archives of Pediatric & Adolescent Medicine, 2011

The amount of weight you carry plus the number of years you carry it for increases the risk for diabetes

Blacks and Hispanics had a higher risk when whites with the same amount of excess weight over time.

American Heart Association, Dec 2011

Physical fitness trumps body weight in reducing death risks

British Medical Journal, 2011

Middle aged adults who averaged 10,000 steps per day over a 5 year period had a lower BM, lower waist hip ratio, and better insulin sensitivity than those who averaged 3000 steps 5 days a week.

Diabetes Metabolism, 2007

Obesity alters the normal metabolic and endocrine function of adipose tissue/ results in an increased production of adipokines and cytokines/ leads to a chronic inflammatory state including insulin resistance

Periodontology 2000, 2003

For every 1000 patients in a dental practice, about 70-100 may have diabetes/ In a practice with 2000 patients, about 3-5 patients per week may have diabetes

American Diabetes Association

Prediabetes: fasting glucose is elevated – 100-125 mg/dl after an overnight fast

Gestational Diabetes: Cause unknown although it is believed that placental hormones may induce insulin resistance
Pancreas works to produce extra insulin and this may result in macrosomia or a larger than normal baby/A baby with macrosomia is at risk for obesity and type 2 diabetes as an adult/2 in 3 chance that if you have had it once during pregnancy you will have it again/Women with Gestational diabetes have a 35-60% chance of developing diabetes in 10-20 years

AAP Position Paper, 2006/National Diabetes Fact Sheet 2011
Poor glycemic control results in more severe periodontitis than those with good control/May develop periodontal disease sooner – up to 15 years earlier/More frequent and advanced AL may occur with longer duration of the disease/Severe periodontal disease has been shown to lead to poor glucose control

Journal Periodontology, 2006
Diabetes may increase the risk for early-onset of periodontal disease/prevalence of gingivitis is higher/poor metabolic control is a factor

J Periodontology, 2010
Association between perio and obesity: studies suggest a positive correlation between obesity & perio especially in younger adults, women, and non-smokers/People who are lean and have high levels of physical fitness have a lower risk of severe periodontal disease

American Diabetes Association, Recommended Test Results, 2012
A1c: <7%, fasting glucose: 90-130 mg/dl, non fasting glucose: <180 mg/dl, BP: < 130/80, LDL: < 100 mg/dl, HDL: > 40 mg/dl, Triglycerides: < 100 mg/dl/What is Tight Control? Blood glucose and glycated hemoglobin levels: Between 70-130 mg/dl before meals/Less than 180 mg/dl 2 hours after a meal and A1C level < 7%/A1c Test formerly HbA1c/Done every 3 mos/Measures average glycemic history over the preceding 2-3 months/Shows amount of glucose in blood over last 3 month/Glucose attaches to hemoglobin (glycosylation)/Stay there for the life of the red blood cell/Diagnosing Diabetes: A1C > 6.5% - new in 2010/Fasting plasma glucose > 126 mg/dl/2-h plasma glucose > 200 mg/dl

New England J of Medicine, 1993 & Annals of Internal Medicine, 1998
In those with type 1 diabetes, over a 6.5 year period, microvascular complications were significantly reduced with tight control/In those with type 2, improved glucose control is associated with significant reductions in complications

Lancet 2009
People who type 2 who had intensive glucose control lowered their change of a fatal and non-fatal heart attack/New England J of Medicine/Intensive therapy that targeted bringing A1c levels to less than 6% increased mortality and did not reduce CVD events

AAP Position Paper, 2006
Limited evidence evaluating the differences in treatment responses between people with and without diabetes/Well controlled patients can respond to treatment similar to a person without diabetes/Poorly controlled patients have a less favorable long term outcome

Periodontal disease and overall health: A clinician’s guide, 2010
Patients with diabetes should be aggressively screened and treated/Levels of glycemic controls should be considered as it may effect healing and response to therapy/Post therapy patients should have frequent maintenance visit

Diabetes treatment and systemic effects:
Taylor 1996: Type 2 subjects (49) with severe periodontal disease, were 4 times more likely to have poor glycemic control than subjects (56) with less severe periodontal disease
Thorstensson 1996: Patients with diabetes and severe periodontal disease had a higher prevalence of renal disease and cardiovascular complications than those with diabetes and none or minor periodontal disease

Janket 2005: Meta analysis of 10 studies found reduction of A1c non significant in relation to periodontal therapy

Teeuw 2010: Meta analysis of 5 studies suggested periodontal therapy could lead to an improvement in A1c for 3 months

Saremi 2006: Periodontal disease was predictive of death from ischemic heart disease and/or renal disease

Schultis, 2007: Periodontal disease increased the severity of nephropathy and end stage renal disease

JADA, January 2012
People who had regular dental care (2+ prophys or periodontal maintainence or both during a year had lower diabetes-related emergency room visits and hospital admissions over a 3 year period

J Clin Perio, Vol 32, 2005
Stress: There is an association between emotional and financial stress, depression and periodontal disease
Limited studies/limited evidence/may be related to other behaviors driven by stress

Osteoporosis: Several studies with limited samples sizes primarily on post menopausal women have shown that low bone mineral density results in > CAL/Some studies have shown no association between osteoporosis and PD/Some have hypothesized that osteoporosis in combination with hormone action, heredity, and other host factors may enhance periodontal susceptibility

Age: Aging does not increase risk; rather older individuals reflect the cumulative effect of PD/Subjects with the highest susceptibility seem to manifest PD at an earlier age

Gender: Men generally exhibit worse periodontal health than women/May reflect worse OH and less use of dental services

Alcohol Consumption
Tezal 2004: Alcohol consumption was moderately associated with an increased risk for AL in a dose dependent fashion
Nishida 2004: Alcohol may be a weak indicator for PD; heavy drinkers who are alcohol sensitive may be at greater risk
Shimazaki 2005: Heavy drinkers were at an increased risk for periodontal disease

Nutritional Influences
Nishada, 2000: Vit Chas been weakly associated with perio on smokers
Nishada, 2000: Low calcium intake has been associated with more severe perio
Deitrich: Vit D may reduce susceptibility to gingivitis through its anti-inflammatory effects

Rx Drug Use, 2007-08 CDC, Sept 2010
Monthly prescription drug use in the age 60 and over age group: 90% took one drug/76% took two drugs/37% used 5 or more drugs/Women more likely to use Rx drugs than men/Non-Hispanic whites have highest usage; Mexican Americans, lowest

American Heart Association Heart Disease and Stroke Statistics, 2012
99% of all CHD patients have exposure to either: high blood pressure, high cholesterol, smoking or diabetes

American J of Cardiology & J of Periodontontology Editors Consensus Report, 2009
Patients with moderate to severe perio: informed that they may be at increased risk for CVD
Patients with moderate to severe perio & 1 known risk factor: Should consider a medical evaluation if not one in 12 mos
Patients with periodontitis & 2 known risk factors: Referred for a medical evaluation if not seen MD in 12 mos

American Heart Association: Nov 2011
Missing teeth, high number of deep pockets, high incidence of gingival bleeding increased risk of heart attack/stroke
Professional cleanings (2 scalings in 2 years) reduced the risk of CVD

Archives of Internal Medicine, 2003
CRP increases with periodontitis but as BMI increases the results are mitigated

J Periodontology, 2008
CRP is influenced by genetics by as much as 20-40%; can be reduced via diet, exercise, smoking cessation, statin therapy

JADA, 2006
Recommending periodontal treatment solely for the purpose of atherosclerotic CVD prevention is not warranted based on scientific evidence/periodontal treatment must be recommended on the basis of the value of its benefits for the oral health of patients

2008 IE Premedication Guideline Update:
Only an extremely small number of cases of IE may be prevented by antibiotic prophylaxis./IE is more likely to result from frequent exposures to bacteremia associated with daily activity/the risk of antibiotic-associated adverse effects exceeds the benefits of prophylactic antibiotic therapy

“Maintenance of optimal oral health and hygiene may reduce the incidence of bacteremia from daily activities and is more important than prophylactic antibiotics for a dental procedures to reduce the risk of Infective Endocarditis”

March of Dimes, 2010
1 in 8 babies are born prematurely/28% increase between 1983 & 2003/Accounts for 34% of US infant deaths/About 8% are low birth weight < 5.5lbs/2/3 are preterm

Adverse Pregnancy Outcomes:
Offenbacher 1996: Periodontal disease was shown to increase the risk of PLBW by 7.9
Jeffcoat 2001: Severe periodontitis increased the likelihood of PTB: 4.45 x before 37 wks, 5.28 x before 35 wks, 7.07 x before 32 weeks
Michalowicz 2006 New England Journal of Medicine: Rate of preterm birth: 12% in treatment group – SRP prior to week 21; 12.8% in the control group/No difference between group for miscarriages, stillbirths or LBW/Similar rates of adverse effects:Periodontal therapy was safe; it had no effect on the outcome of pregnancy
Offenbacher, 2009: No significant difference in preterm birth rates between groups that received SRP in 1st trimester and those that received it post delivery.
Meta analysis/American J of Obstetrics & Gynecology 2009: SRP during pregnancy may reduce preterm birth
Meta analysis/JADA 2010: Periodontal treatment during pregnancy does not reduce the rate of preterm birth

Standards for Clinical Dental Hygiene Care, ADHA, 2008
Patient History: personal profile/current and past dental and dental hygiene practices
Health history data includes: current and past health status/diversity and cultural consideration/pharmacological consideration/mental health/learning disabilities/economics/vital signs/consultations as needed

Mayo Clinic Procedures, 2003
The medical history is the most frequent and important procedure/gather information/build a relationship/educate pt.
Most important question: What else or anything else?

American Diabetes Association, 2012
A: A1c  B: blood pressure  C: cholesterol

J Periodontology, 2005
Drugs that precipitate bleeding: oral anti-coagulants/anti-thrombiotic/anti-inflammatory/aspirin/ginger/garlic/ ginko
Drugs that inhibit bleeding: corticosteroids/some antibiotics
Drugs that contribute to xerostomia: more than 400

Bisphosphonates:

**JADA, 2006:** IV bisphosphonates raise risk of ONJ but the risk is very low 0.7 per 100,000; you can minimize the risk but not eliminate it; no diagnostic tool to predict who is at risk

**JADA, 2008:** Oral bisphosphonates users not at risk for ONJ; may even reduce risk

**JADA 2009:** Case study indicates risk for oral users may be higher than previously thought

**FDA:** oral bisphosphonates may raise the risk of a rare type of femur fracture

**Standards for Clinical Dental Hygiene Care, ADHA, 2008**

**Comprehensive Clinical Exam:** Thorough head and neck exam including oral cancer screening and TMJ assessment

Radiograph/Periodontal evaluation/Full mouth periodontal charting/Probing depth/Bleeding point/Suppuration

Mucogingival relationships/defects/Recession/Attachment level/lossPresence of plaque/calculus/Gingival health
disease/Bone loss/Mobility/fremitus/Furcation involvement/Hard tissue evaluation including charting of existing
condition and habits

**American Academy of Periodontology, 2003**

Despite our increased understanding of the etiology and pathogenesis of periodontal infections, the diagnosis and classification of these diseases is still based almost entirely on traditional clinical assessments.

**Bleeding on Probing**

**Lang 1986:** The positive predictive value of BOP for disease progression is low

**Rahardjo, 2005:** Non smokers with BOP at an annual exam had 26% probability of disease progression over 3 years

**Lang 1986 Rahardjo 2005:** The absence of bleeding is a positive criteria for periodontal health

**Probing Depth**

**Annals of Periodontology, 1996:** A measure of past disease activity/Deep probing depth has a low predictive value for future disease progression/Probing cannot detect small changes in disease progression

It is difficult for probing measurements to adequately reflect the multidimensional nature of the periodontal
Defect/Insertion force/Shape and size of probe tip/Measurement scale/Inflammatory status

**Radiographs**

**AAP, 2003:** Provide information that cannot be obtained any other way/May Underestimate true bone loss

30-50% bone loss can occur before there is radiographic evidence/Digital subtraction radiography may detect density changes as low as 5%

**JADA, 2006:** for need for xrays on a periodontal patient is a matter of clinical judgment; in a patients with no caries/low risk: 24-36 mos/in a patients with caries/high risk: 6-18 mos

**Adv Dental Research: 2011:**

Salivary tests have the potential to create practical instruments that are convenient, practical, and comfortable to use Currently, there are no simple, accurate, inexpensive detections methods to support at this time

Clinical applications must be independently validated to insure they are accurate, reliable, precise, consistent

**Standards for Clinical Dental Hygiene Care, ADHA, 2008**

**Risk Assessment:** Fluoride exposure/Tobacco including spit tobacco and exposure to 2nd hand smoke/ Nutrition diet

Systemic diseases/Prescription/OTC/Supplements/Salivary function/Age and gender/Genetics/family

history/Habits/lifestyle/Cultural issues/Substance abuse/Eating disorder/spiercing/body modification/Oral

habits/Sports/recreation/Physical disability

**J Dental Research, 2003:** increased preventive practices lead to greater tooth retentention
Periodontology 2000, 2005
The highest level of evidence, a systematic review, provides conclusive evidence for the beneficial effect and efficacy of non surgical pocket therapy in the treatment of periodontal disease.
SRP reduces inflammation, pocket depth, and increases attachment
Maintenance therapy reduces inflammation, disturbs biofilm, stabilizes probing depth and attachment.

AAP 2003; Periodontal Maintenance Paper
Recurrent gingivitis, without AL may be maintained with semi-annual visits/For most with a history of PD and AL, intervals should be less than six months/Appointment time should be individualized and dictated by factors such as number of teeth, implants, cooperation, OH, compliance, systemic health, access, and depth of pockets

American Academy of Periodontology /2010 Statement on Lasers
Minimal evidence to support the use of a laser for the purpose of periodontal debridement either as a monotherapy or adjunct to SRP/Evidence is conflicting in the reduction of bacteria beyond traditional SRO; Er/YAG have the greatest potential for root debridement

Graves et al, J Periodontol, 1989
2-week trial with 119 adults comparing brushing & flossing to brushing alone/Brushing & flossing was supervised/Toothbrushing achieved a 35% reduction in bleeding /Brushing and flossing achieved a 67% reduction in bleeding sites

International J of Dental Hygiene, 2008
Meta-analysis of 11 studies; minimum 28 days Four found better plaque removal with the addition of floss/One found a greater reduction in bleeding with floss/The routine instruction of flossing is not supported by scientific evidence/The RDH should determine on an individual basis whether high quality flossing is an achievable goal

J Dental Research, 2006
Flossing’s effectiveness in reducing caries is dependent upon fluoride exposure and compliance/There are no studies showing flossing prevents caries in adults in ‘real-world’ conditions/The dental professional should determine on an individual basis whether quality flossing is achievable/One should be careful to justify flossing based on ‘common-sense’ arguments when other caries prevention interventions are supported by higher levels of evidence.

Canadian Dental Hygienists’ Association Position Paper on Flossing, 2006
Many flossing aids and interdental cleaners including floss holders, automated flossers, interdental brushes, picks, wooden sticks, and some home irrigators are viable alternatives to manual finger flossing

Yankell et al, J Clin Dent, 2002
BrushPicks vs Glide Floss Similar reductions in plaque Greater reduction in Bl & GI for BrushPicks

Lewis et al, J Periodontol, 2004
Toothpick holder vs floss: no significant differences for plaque, interproximal plaque or bleeding

Christou et al, J Periodontol, 1998
Interdental brush reduced significantly more plaque than floss but similar in bleeding

Kleber et al, J Dent Hyg, 1990
Floss holder vs traditional floss: Equally successful in removing plaque and reducing gingivitis

Rosema et al, J Int Acad Periodontology, Jan 2011
The Water Flosser was twice as effective as floss at reducing gingival bleeding
The Water Flosser with the Orthodontic Tip was 3x as effective as floss in reducing plaque and 26% more effective at reducing bleeding

Barnes et al, J Clin Dent, 2005
The Water Flosser with the Classic Jet Tip was up to 93% more effective at floss in reducing bleeding and up to 52% more effective at reducing gingivitis

Compendium Cont Ed in Dent, March 2009
The pressure and pulsation combination of the Water flosser removed 99.9% of plaque biofilm in treated areas Daily use of a Water Flosser can significantly reduce the bacterial load and the risk for periodontal disease

Sharma, 2012
The Water Flosser was 80% more effective at reducing gingivitis and 70% more effective at reducing plaque than the Air Floss

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Water Flosser: An Evolutionary Step in Interdental Care/The Diabetes Epidemic: The Impact on Oral Healthcare Providers
The New Challenges of Child and Adolescent Health
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Coaching Your Patients to Optimal Interdental Health
Periodontal Therapy & Maintenance

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Resources

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62. Sharma et al. Effect of a dental water jet with orthodontic tip on plaque and bleeding in adolescent patients with fixed
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70. Jolkovsky DL et al. Clinical and microbiological effects of subgingival and gingival marginal irrigation with chlorhexidine
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