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Home Irrigation Shown to Help in the Management of Individuals With Diabetes

A recent study has shown that individuals with diabetes who added twice daily water irrigation to their oral care routine improved both oral and systemic health parameters better than those who only brushed and flossed.¹

The twelve-week clinical trial consisted of 56 subjects with either Type 1 or Type 2 diabetes (diabetic for at least one year and on the same medication for at least 6 months) and moderate to advanced periodontal disease (pockets ranging from 5 mm - 8 mm). Both groups received ultrasonic scaling and root planing. Each group was then assigned to a self-care routine consisting of either routine oral hygiene only or routine oral hygiene plus twice daily water irrigation with the Pik Pocket[®] subgingival irrigation tip.¹

At twelve weeks, the following outcomes were observed from baseline:

Periodontal Parameters:

- The irrigation group had significantly better reductions in plaque, gingivitis, and bleeding on probing in comparison to routine oral hygiene group
- Both groups had similar reductions in probing depth and gains in clinical attachment

Systemic Parameters:

- Both groups had numerical improvements in glycated hemoglobin measurement (HbA_{1C}); there was no statistical difference between the groups
- The irrigation group had statistically significant improvement in reactive oxygen species (ROS) generation over the control group
- The irrigation group had significant improvements in the serum cytokine levels of IL-1 β and PGE₂. The control group had an improvement for IL-1 β only.



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The superior reduction in periodontal outcomes for the irrigation group was anticipated as numerous studies over the last forty years have demonstrated the ability of home irrigation to improve oral health above and beyond that of routine oral hygiene.²⁻⁸ What has been less firmly established is how improvements in oral health affect systemic health parameters. The design of this study examines that link.

Individuals with diabetes may have prolonged hyperglycemia, which stimulates a process of inflammatory tissue destruction. Two components of this destructive process are the generation of ROS (also called oxygen free radicals) and pro-inflammatory cytokines.^{9,10} In this study, the greater reduction in clinical parameters correlated to a greater reduction in the expression of both oxygen free radicals and pro-inflammatory cytokines.¹



Pik Pocket®
subgingival irrigation tip

These findings lead the researchers to conclude that the inclusion of subgingival water irrigation as an adjunctive therapy may have a cumulative positive influence in regaining periodontal tissue health in diabetic individuals.

References can be found on page 4.

TABLE 1 Diabetes Causes Life-Threatening Complications:¹¹

- **Blindness:** 12,000 – 24,000 lose their sight each year
- **Kidney Disease:** Leading cause of end-stage renal disease – 27,900 per year
- **Nerve Disease & Amputations:** Most frequent cause of non-traumatic lower limb amputations – 56,000 per year
- **Heart Disease and Stroke:** 2 – 4 times more likely to have heart disease or stroke – more than 77,000 deaths per year

Diabetes and Periodontal Health

With the growing number of individuals with diabetes, it is likely that most dental practitioners will see patients with this disease more frequently. Therefore, it is not unlikely that in the near future, the daily schedule of patients may include at least one person with diabetes.

Evaluating Patients with Diabetes

Initially, it is important to discern what type of diabetes the patient has as well as how long the disease has been present. This applies to both adults and children as younger individuals with a history of obesity are developing Type 2 diabetes.¹⁴ With some rare exceptions, such as gestational diabetes, which generally only lasts through pregnancy,¹¹ most patients, should distinguish their disease as Type 1 or 2. Age of onset and duration of the disease should be noted.¹⁴

The type of medication the patient takes should be recorded. Generally speaking, a patient that only takes oral medications is most likely Type 2. However, Type 2's may also need insulin injections. Therefore, confirmation by the physician may be necessary. In addition to type, ask patients about compliance, monitoring, most recent testing and results.¹⁴

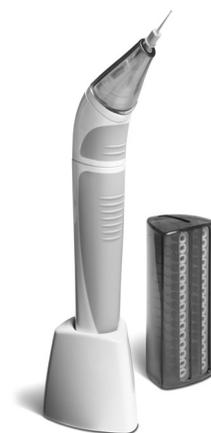
Complications are a serious and life-threatening consequence of diabetes.^{11,14} See Table 1. The incidence and severity of periodontal disease may present along with these complications, and has sometimes been considered an additional diabetic complication.¹⁰

Impact on Periodontal Disease

While the presence of diabetes has been shown to increase a person's risk for periodontal disease,^{10,15} it is metabolic control that has been established as playing the most important role.^{16, 17} In those whom diabetes is uncontrolled or poorly controlled, there is generally more attachment and alveolar bone loss resulting in more severe periodontal disease.^{17,18}

Poor metabolic control has been shown to affect the patient's immune response making them more susceptible to periodontal disease.^{16,17} With poorer metabolic control, the diabetic will often have prolonged hyperglycemia.^{10,17} This state produces the formation of Advanced Glycation End Products, called AGEs.^{9,10} This alters the response of the immune system by:¹⁹

- Impairing polymorphonuclear leukocyte (PMN) functioning¹⁰
- Enhancing expression of inflammatory mediators such as cytokines^{10,19}
- Increasing production of oxygen free radicals^{9,10}



Waterpik™ Flosser
Model FL-110

Managing Periodontal Disease in Diabetic Patients

Many individuals with diabetes are unaware of the oral health implications of their disease.²⁰ Regular professional oral care and self-care is critical for all patients with diabetes. The dental hygiene visit often provides the best opportunity to educate the patient about the link between diabetes and periodontitis.¹² Relating periodontal



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findings to diabetes provides the patient with a concrete example of the impact of diabetes on oral health.

Depending on metabolic control and periodontal disease status frequent periodontal maintenance visits may be required.¹⁴

Type 1 or 2 patients with good diabetic control can be treated similar to healthy individuals. For individuals who are uncontrolled or poorly controlled, medical clearance should be given before periodontal therapy, including scaling and root planing.^{14,18} Research has shown that individuals with poor control may initially respond well to therapy, but the results are short-term. A return to deep pockets leads to a less favorable long-term response to therapy.¹⁸

Ideally, a self-care plan should be tailored to the patients' individual needs. Patients with diabetes may experience more gingivitis and deeper probing depths due to an impaired immune response.¹⁸ Because of this, diabetics need meticulous self-care.

Powered devices such as toothbrushes, flossers and oral irrigators may need to be a first choice rather than optional consideration for many patients with diabetes. The use of all three devices by a patient can provide a multi-pronged approach in fighting periodontal disease. Power brushes and flossers are effective in removing plaque and reducing gingivitis and bleeding.²¹ However, for maximum patient benefit, the addition of oral irrigation can further enhance gingivitis and bleeding on probing reductions¹⁻⁸ as well as

control subgingival bacteria³ and modify the host immune response.^{1,2} Importantly, these devices are readily available at variable prices making it affordable for most patients.

Conclusion

Treating patients with diabetes will be a continuing challenge for many oral health practitioners. Current knowledge about diabetes will be critical. The American Diabetes Association can provide both patients with diabetes and health care practitioners with the most current information. They can be found on the Internet at www.diabetes.org¹¹ The American Academy of Periodontology also has position statements and publications with information on treating diabetic patients and on the relationship between diabetes and periodontal disease. They too can be found on the web at www.perio.org²²

References can be found on page 4.

Facts and Statistics

FACTS ABOUT DIABETES:¹¹

- Afflicts **15.7 million** people in the US (about 5.9%)
- **5.4 million** of these individuals are undiagnosed
- **798,000** people will be diagnosed this year – or about 2,200 per day
- It is the **7th** leading cause of death
- It is a chronic disease with **no cure**

TYPE 1 AND TYPE 2 DIABETES^{11,12}

TYPE 1

- Caused by destruction of the insulin producing Beta cells of the pancreas resulting in insulin deficiency
- Requires daily insulin intake
- Generally has an abrupt onset
- Accounts for 5% - 10% of diabetes

TYPE 2

- Caused by impaired insulin function resulting in insulin resistance sometimes combined with relative insulin deficiency
- Onset of symptoms generally gradual
- Often related to obesity
- Accounts for 90%-95% of diabetes

SYMPTOMS OF DIABETES:¹¹

- Frequent urination
- Excessive thirst
- Extreme hunger
- Unusual weight loss
- Increased fatigue
- Irritability
- Blurry vision

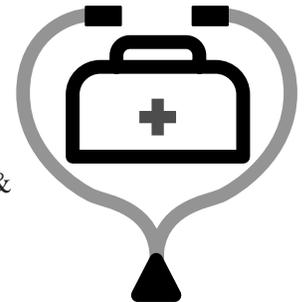


New Guidelines from the American Diabetes Association “Pre-Diabetes”¹¹

- Medical diagnosis - as of March 2002
- Applies to individuals with impaired glucose tolerance
- Estimated that the diagnosis will apply to 16 million people
- Increases the risk of developing Type 2 diabetes by 50%
- Risk can be cut in half by walking 30 minutes per day and a 5%-7% weight loss
- Testing is recommended for*:
 - Everyone over age 45
 - Younger adults who are overweight, have a family history, high cholesterol, high blood pressure, had gestational diabetes, gave birth to a baby over 9 lbs., or are of a racial minority

*Some Groups Have a Higher Prevalence of Diabetes:¹¹

- **Seniors:** 50% of people older than 55 years of age
- **African Americans:** 25% of African Americans between the ages of 65 & 74
- **Native Americans:** 12.2% of Native Americans
- **Latinos:** 24% of Mexican Americans and 26% of Puerto Ricans between the ages of 45 & 74; 16% of Cuban Americans between the ages of 45-74



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The logo for Waterpik Technologies, featuring the word "waterpik" in a bold, lowercase font with a stylized water spray icon above the "i", and "Technologies" in a smaller font below it.

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