

# The Burnham Review

## Diabetes and Manual Therapy Approaches

Consider Manual Therapy and Complementary and Alternative Medicine for Optimal Health

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**Kimberly Burnham, PhD Editor**

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### Manual Therapy and Diabetes

There are a number of manual therapies, including massage, reflexology, Integrative Manual Therapy, Osteopathic Manual Treatment and imagery, which have been shown clinically to improve the signs and symptoms of diabetes. This issue of The Burnham Review looks at the research.

### Diabetes and Chiropractics

Diabetes is the fifth deadliest disease in the United States and a growing epidemic worldwide. Now, researchers are finding evidence that chiropractic adjustments might be able to make a valuable contribution to an overall program of wellness care to help diabetes sufferers.

A study published in the Journal of Vertebral Subluxation Research, focused on the positive response to chiropractic when used as part of an integrative treatment in the care of a patient with adult onset diabetes.

Along with chiropractic care, the patient also received nutritional and exercise guidance. The chiropractic care was directed toward correcting misalignments in the spine, called

vertebral subluxations, which affect the relationship between the nervous system and organs. After one month of being on the program, the patient's glucose blood and urine levels had

normalized and remained stable. His medical doctor, who monitored his progress, said the patient would not need insulin if the condition remained stable."<sup>1</sup> (WCA 2007).

### Peripheral Neuropathy and Alternative Therapies

Peripheral neuropathy (PN), associated with diabetes, neurotoxic chemotherapy, HIV /antiretroviral drugs, alcoholism, nutrient deficiencies, heavy metal toxicity, and other etiologies, results in significant morbidity.

A widening body of research indicates alternative medicine may offer significant benefit to this patient population. Alpha-lipoic acid, acetyl-L-carnitine, benfotiamine, methylcobalamin, and topical capsaicin are among the most well-researched alternative options for the treatment of PN. Other potential nutrient or botanical

therapies include vitamin E, glutathione, folate, pyridoxine, biotin, myo-inositol, omega-3 and -6 fatty acids, L-arginine, L-glutamine, taurine, N-acetylcysteine, zinc, magnesium, chromium, and St. John's wort.

In the realm of physical medicine, acupuncture, magnetic therapy, and yoga have been found to provide benefit."<sup>2</sup> (Head,2006).

### Massage and Diabetes

Twenty diabetic children were randomly assigned to a touch therapy or relaxation therapy group. The children's parents were taught one or the other therapy and were asked to provide them for 20 minutes before bedtime each night for 30 days.

"The immediate effects of the touch therapy were reduced parent anxiety and depressed mood and reduced child anxiety, fidgetiness and depressed affect. Over the 30 day period compliance on insulin and food regulation improved and blood glucose levels decreased from 159 to

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within the normal range.”<sup>3</sup>(Field,1997).

### **Aromatherapy, Massage, and Reflexology's Positive Influence**

In a clinical review, the British Medical Journal published an article saying, "therapeutic massage is the manipulation of the soft tissue of whole body areas to bring about generalized improvements in health, such as relaxation or improved sleep, or specific physical benefits, such as relief of muscular aches and pains.

Practitioners of reflexology claim that, in addition to the relaxation and nonspecific effects of massage, they can bring about more specific changes in health. One classic reflexology text, for example, includes case histories of ataxia, osteoarthritis, and epilepsy. Similarly, some aromatherapists report benefits in conditions as diverse as infertility, acne, diabetes, and hay fever." <sup>4</sup>(Vickers,1999).

### **Yoga and Diabetes**

“Studies in a systematic search yielded 32 articles published between 1980 and April 2007 and found “yoga interventions are generally effective in reducing body weight, blood pressure, glucose level and high cholesterol, but only a few studies examined long-term adherence.” <sup>5</sup>(Yang,2007).

In another study researchers said, “there is growing evidence that yoga may offer a safe and cost-effective intervention for Type 2 Diabetes mellitus.

We identified 25 eligible studies, overall, these studies suggest beneficial changes in several risk indices, including glucose tolerance and insulin sensitivity, lipid profiles, anthropometric characteristics, blood pressure, oxidative stress, coagulation profiles, sympathetic

activation and pulmonary function, as well as improvement in specific clinical outcomes.

Yoga may improve risk profiles in adults with DM 2, and may have promise for the prevention and management of cardiovascular complications in this population.<sup>6</sup> (Innes,2007).

### **Palpability of Type II Diabetes**

Although type 2 diabetes mellitus is often managed by osteopathic physicians, osteopathic palpatory findings in this disease have not been adequately studied.

“A case-control study was used to measure the association between type 2 diabetes mellitus and a series of 30 osteopathic palpatory findings. The latter included skin changes, trophic changes, tissue changes, tenderness, and immobility at spinal segmental levels T5-T7, T8-T10, and T11-L2 bilaterally.

A total of 92 subjects were included in the study. After controlling for age, sex, hypertension, and clinical depression, the only significant finding was an association between type 2 diabetes mellitus and tissue changes at T11-L2 on the right side

Subgroup analyses of subjects with type 2 diabetes mellitus and hypertension demonstrated significant associations with tissue changes at T11-L2 bilaterally for the left side and for the right side.

The only consistent finding in this study was an association between type 2 diabetes mellitus and tissue changes at T11-L2 on the right side. Potential explanations for this finding include reflex viscerosomatic changes directly related to the progression of type 2 diabetes mellitus, a spurious association attributable to confounding visceral

diseases, or a chance observation unrelated to type 2 diabetes mellitus.<sup>7</sup> (Licciardone,2007).

### **The Role of Relaxation, Hypnosis, and Imagery**

Stress reduction is a vital part of diabetes management. This is especially true in Type II diabetes, where it appears to lower blood glucose directly<sup>8</sup>(Feinglos,1987) and <sup>9</sup>(Surwit,2002).

In Type I, the advantages of relaxation, hypnosis, biofeedback, and guided imagery appear to stem largely from improved behaviors, although there is some evidence of a direct effect <sup>10</sup>(McGrady,1990) and <sup>11</sup>(Ratner,1990).

Researchers found that both depression and anxiety worsen glycemic control both directly, and indirectly through behavior<sup>12</sup> (McGrady,1999). Depression and anxiety can be partially relieved through relaxation and self-hypnosis (guided imagery) <sup>13</sup>(Davidson,1978) and <sup>14</sup>(Stetter,1994).

Other researchers found that several areas of diabetes self-care behavior improved in a group of patients who listened to guided imagery tapes <sup>15</sup>(Wichowski,1999).

Biofeedback and relaxation significantly lowered blood glucose, A1C, muscle tension, depression, and anxiety in subjects (McGinnis, McGrady et al, 2005). Thermal biofeedback, when used alone or in combination with other mind-body techniques, can improve quality of life and the level of activity by improving blood flow, pain, neuropathy, healing ulcers.<sup>16</sup> (Galper,2003).

A low-cost guided imagery-based program can improve compliance in diabetics of both types and improve glycemic control in Type II

diabetics.<sup>17</sup> (AGI,2006).

### **Diabetes Herbal Therapy NIH Says Gymnema Sylvestre Lowers Serum Glucose Levels**

Going to the gym and working out supports people managing the signs and symptoms of diabetes, high cholesterol as well as other liver and blood sugar imbalances. Taking an herb called Gymnema has also been found effective in managing blood sugar levels in Type 1 diabetics as well as Type 2 diabetics.

Like working out at the gym, taking the herbal supplement, Gymnema it is not a quick fix, but according to the National Health Institute<sup>18</sup> (NIH,2008) can be used as an adjunct to conventional therapy by diabetics and adults wanting to balance out blood sugar and cholesterol levels.

Traditionally, Gymnema has been used as an antimicrobial, aphrodisiac, cancer, cardiovascular disease, constipation, cough, digestive stimulant, gout, high blood pressure, laxative, liver disease, liver protection, malaria, obesity, rheumatoid arthritis, snake venom antidote, stomach ailments, uterine stimulant, and weight loss.

The weight loss aspect occurs because taking Gymnema affects the sugar related taste buds.

At this point researchers are looking at exercises, herbal medicine, manual therapies, massage therapy, Yoga, Integrative Manual Therapy, Acupuncture, Acupressure, and medications to find ways to stem the rise in death and significant quality of life problems secondary to diabetes. The health care costs and loss of work place productivity due to diabetes is also driving the research.

According to the latest World

Health Organization (WHO) estimates, the number of people worldwide with diabetes climbed from 30 million in 1985 to 171 million in 2000. Some 4 percent to 6 percent of adults aged 20 and over are now affected.

In a 2007 study by Dr. David W. Dunstan, of the International Diabetes Institute, Melbourne, Australia, investigators found that “the more time women spent television viewing, the higher their blood glucose levels two hours after they took the glucose test-drink.” This study linked time spent doing sedentary activities such as watching TV to over all higher blood sugar levels.

Consideration should be given by a health care professional if the person is also taking blood sugar lowering drugs or medications for lowering cholesterol. The NIH notes that “increased effects may occur if taken in combination with herbs or supplements that lower cholesterol such as fish oil, garlic, guggul, or niacin.”<sup>19</sup> (Anathan,2003),<sup>20</sup> (Cicero,2004),<sup>21</sup> (Khare,1983),<sup>22</sup> (Meiselman,1970),<sup>23</sup> (Shanmugasundaram,1990), and<sup>24</sup> (Yeh,2003).

### **Is Alzheimer's a Form of Diabetes?**

More evidence has been uncovered that Alzheimer's disease may actually be a third form of diabetes, according to researchers from Northwestern University.

“Insulin and insulin receptors in your brain are crucial for learning and memory, and it's known that these components are lower in people with Alzheimer's disease. In your brain, insulin binds to an insulin receptor at a synapse, which triggers a mechanism that allows nerve cells to survive and memories to form.

Alzheimer's disease was tentatively dubbed “type 3 diabetes” in early 2005 when researchers learned that your pancreas is not your only organ that produces insulin. Your brain also produces insulin, and this brain insulin is necessary for the survival of your brain cells.

Interestingly, while low insulin levels are typically associated with improved health, the opposite appears to be true for your brain.

A drop in insulin production in your brain contributes to the degeneration of your brain cells, and studies have found that people with lower levels of insulin and insulin receptors in their brain often have Alzheimer's disease.

This new study from Northwestern University has found that a toxic protein may be rendering your neurons insulin resistant and blocking your memory function.

Another noteworthy connection between Alzheimer's disease and diabetes came out in 2004, when it was revealed that people with diabetes might have a 65 percent higher risk of developing Alzheimer's disease.”

If you want to significantly cut your risk of both diabetes and Alzheimer's, you can:

Exercise. Exercise protects your brain just as it protects the rest of your body from diabetes.

Eat a nutritious diet that's right for your nutritional type.

Get plenty of high-quality omega-3 in your diet, such as by taking a krill oil supplement. A diet rich in omega-3 fats has been found to ward off both Alzheimer's disease and diabetes.”<sup>25</sup> (Mercola,2007),<sup>26</sup> (Pilcher,2006) and<sup>27</sup> (MLA,2007).

### **Freidreich's Ataxia**

“This is an inherited nervous

system disorder causing loss of balance and coordination. Sufferers of this condition may also have heart disease and diabetes. Cranial sacral techniques may have therapeutic benefit to this condition."<sup>28</sup> (Touch of Health,2008).

### Measuring Diabetes Results

In a study "to determine the correlation between strength and functional measures, and the intercorrelation between the functional measures themselves, in a group of subjects with diabetes mellitus (DM) and transmetatarsal amputation (TMA), researchers looked at "30 subjects with DM and TMA (mean age 61.7 +/- 11.3 years) were studied. Function was measured using Functional Reach Test (FR), Physical Performance Test (PPT), Sickness Impact Profile (SIP), and walking speed for 15.24 m. Strength measurements were taken using a hand-held dynamometer.

The relationship between measures of hip and knee muscle strength and function provides some evidence that rehabilitation should focus on strengthening hip and knee extensors and flexors to improve function. The relationships between walking speed and strength, PPT, FR and SIP suggest that the simple measure of walking speed is a useful functional test in the clinic."<sup>29</sup> (Salsich,1997)

### TheraSauna Far Infra-Red

Infrared heat is light produced by the sun. This is the heat you feel penetrate your skin when you stand in the sun and miss when you walk into the shade. Infrared energy is also given off as body heat.

The human body can also absorb infrared heat. Infrared energy is measured in wavelengths as microns. The human body can best absorb infrared energy in the 3- to

50-micron range, with the best absorption occurring at 9.4 microns.<sup>30</sup> (TheraSauna,2008).

Conditions That Have Been Successfully Treated with an Infrared Sauna, include Diabetes, TMJ Arthritis, Cancer Pain, Traumatic Arthritis, Duodenal Ulcers, Bursitis, Insomnia, and Rheumatoid Arthritis<sup>31</sup>. (Naturopath,2008) and<sup>32</sup> (Aetna,2008).

### Diabetes, Collagen and Green Tea

"Diabetes leads to modification of collagen such as advanced glycation and cross-linking which play an important role in the pathogenesis of diabetes mellitus.

The present study reveals that green tea is effective in reducing the modification of tail tendon collagen in diabetic rats. Thus green tea may have a therapeutic effect in the treatment of glycation induced complications of diabetes."<sup>33</sup> (Babu,2008).

Iso and colleagues reported that consumption of green tea and coffee could significantly reduce the risk for type 2. <sup>34</sup>(Iso,2006) and <sup>35</sup>(Chen,2006).

For ages, plants containing flavonoids have been used to treat diabetes in Indian medicine. The green tea flavonoid has been shown to have insulin-like activity as well as insulin-enhancing activity. However, epigallocatechin gallate, which is the principal catechin in green tea, differs from insulin because it affects several insulin-activated kinases with slower kinetics. Thus, epigallocatechin gallate may be an antidiabetic.<sup>36</sup> (Anderson,2002, <sup>37</sup>(Tsuneki,2004),<sup>38</sup> (Mascitelli,2006) and <sup>39</sup>(Cheng,2006).

### Vagus, Immune and Acetylcholine

"It used to be dogma that the brain

was shut away from the actions of the immune system, shielded from the outside forces of nature. But that's not how it is at all. In fact, thanks to the scientific detective work of Kevin Tracey, MD, it turns out that the brain talks directly to the immune system, sending commands that control the body's inflammatory response to infection and autoimmune diseases. Understanding the intimate relationship is leading to a novel way to treat diseases triggered by a dangerous inflammatory response.

Dr. Tracey, director and chief executive of The Feinstein Institute for Medical Research, found that "stimulation of the vagus nerve could block a rogue inflammatory response and treat a number of diseases, including life-threatening sepsis.

The vagus nerve is located in the brainstem and snakes down from the brain to the heart and on through to the abdomen. Dr. Tracey and others are now studying ways of altering the brain's response or targeting the immune system itself as a way to control diseases.

Dr. Tracey discovered that the vagus nerve speaks directly to the immune system through a neurochemical called acetylcholine. And stimulating the vagus nerve sent commands to the immune system to stop pumping out toxic inflammatory markers. "This was so surprising to us," said Dr. Tracey, who immediately saw the potential to use vagus stimulation as a way to shut off abnormal immune system responses. He calls this network "the inflammatory reflex."

Research is now underway to see whether tweaking the brain's acetylcholine system could be a natural way to control the inflammatory response.

Inflammation is key to many diseases - from autoimmune conditions like Crohn's disease, Diabetes and rheumatoid arthritis to Alzheimer's, where scientists have identified a strong inflammatory component.

Tracery has also written a book called "Fatal Sequence," about the double-edge sword of the immune system.<sup>40</sup> (TaLAN,2007).

### **Diabetes, Depression, Nutrition and Physical Activity**

The high glucose levels typically occurring among adults with type 2 diabetes contribute to blood vessel injury and complications such as blindness, kidney failure, heart disease, and stroke.

Higher physical activity levels are associated with improved glycemic control, as measured by hemoglobin A1C. A 1% absolute increase in A1C is associated with an 18% increased risk for heart disease or stroke.

Among Canadians with type 2 diabetes, we postulate that declines in walking associated with colder temperatures and inclement weather may contribute to annual post-winter increases in A1C levels.

In this study assessments included use of a pedometer with a concealed viewing window for a two-week period to measure walking; a study centre visit during which venous blood is sampled for A1C, anthropometrics are assessed, and questionnaires are completed for measurement of other factors that may influence walking and/or A1C (e.g. food frequency, depressive symptomology, medications).

Although we cannot alter weather patterns to favour active lifestyles, we can design treatment strategies that take seasonal and weather-related variations into

account.

Strategies may include shifting to indoor activities or adapting to less favourable conditions; increasing dose/number of glucose-lowering medications during the winter and reducing these during the summer, in anticipation of seasonal variations and examining the impact of bright light therapy on activity and A1C among T2D patients with an increase in depressive symptomology when sunlight hours decline.<sup>41</sup> (Dasgupta,2007).

### **Physical Activity**

Many people use Integrative Manual Therapy (IMT) to decrease pain, increase energy levels and enable them to be more physically active.

Research has shown that physical activity can: Lower your blood glucose and your blood pressure. Lower your bad cholesterol and raise your good cholesterol. Improve your body's ability to use insulin. Lower your risk for heart disease and stroke. Keep your heart and bones strong. Keep your joints flexible. Lower your risk of falling. Help you lose weight. Reduce your body fat. Give you more energy. Reduce your stress<sup>42</sup>(NDIC,2008).

### **Gluten and Diabetes**

Celiac disease develops from an autoimmune response to specific dietary grains that contain gluten. Diagnosis can be made based on the classical presentation of diarrhea, fatty stools, and abdominal bloating and cramping, as well as the presence of specific serum antibodies. In addition, gluten ingestion has increasingly been found to be associated with other conditions not usually correlated with gluten intolerance. The subsequent diversity of the clinical

presentation in these cases can complicate decision-making and delay treatment initiation in conditions such as ataxia, headaches, arthritis, neuropathy, type 1 diabetes mellitus, and others.<sup>43</sup> (Helms,2005).

### **Blood Chemistry**

Osteopath, Dr. Andrew Taylor Still said, "the Law of the Artery is Supreme."

"Dr. Still (late 19th century), an American, was responsible for the introduction of Osteopathy. He believed that the body had within itself the power to control all diseases . He also considered that anatomical lesions caused physiological malfunction . e . g . Dislocation of the hips is a frequent cause of diabetes ."<sup>44</sup> (Atkinson,1978).

Upon the principle that the blood is our curative agent, will this blood not give us the best indication of destruction going on within the body? All the tissues of the body are bathed with blood and lymph, and it seems only natural to look to the blood for pathology within these tissues.

If the blood contains an abnormal amount of one or more of its component parts, certainly some part of our anatomy is not functioning properly, and since we know where these various substances are formed, will not the blood analysis be a great aid to us in making our diagnosis? A thorough blood examination seems to me to uphold the basic principles of Osteopathy.<sup>45</sup> (Millard,1922).

**For more information and references see**

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