

### **WHY HIGH BLOOD SUGAR (GLUCOSE) WORSENS PAIN**

Physicians who treated severe chronic pain patients long ago recognized that diabetics tended to have pain that was quite often difficult to control. What they didn't know was that chronic severe pain can elevate blood glucose (sugar). This may worsen the pain by increasing central nervous system (CNS) inflammation that is damaging to the endorphin (opioid) receptors.

#### **MAJOR CONCERN**

Many long-time chronic pain patients complain that their opioid medication is no longer very effective. This includes persons with intraspinal opioid pumps. One of the reasons that opioids may decrease their effectiveness is that high blood sugar, over time, can seriously damage their endorphin (opioid) receptors, causing them to lose function over time.

#### **HOW CONSTANT PAIN CAUSES GLUCOSE ELEVATIONS**

Severe pain, acute or chronic, is a severe stress that raises blood cortisol and glucose. If pain is constant, blood glucose is constantly raised which is the definition of diabetes. Unless pain is controlled, insulin reserves in the pancreas may diminish, so blood sugar may remain elevated. Elevated glucose damages tissue throughout the entire body. This situation is now called "insulin resistance." With severe pain, a vicious cycle may set in- more pain, more elevated blood sugar, and then more pain!

#### **TWO MAJOR METABOLIC ALTERATIONS IN THE CNS DUE TO EXCESS GLUCOSE**

- #1. Promotes the spread of neuroinflammation
- #2. Alters endorphin (opioid) receptors so opioids diminish their effectiveness

#### **RESULTS:**

- ° More pain
- ° Opioids lose effectiveness

#### **STRATEGY AND MEASURES TO MINIMIZE GLUCOSE DAMAGE**

- ✓ Blood glucose testing-see your medical practitioner.
- ✓ Decrease carbohydrates (sugars, and starches) in diet.
- ✓ Strive for pain-free hours to give your pancreas and adrenals some rest.
- ✓ Get some sound sleep each day.
- ✓ Consider one month trial of Metformin -start 250 to 500 mg. at bedtime. This agent usually lowers blood sugar and reduces neuroinflammation, and many persons with IPS claim it a significant help.

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