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Insulin Resistance: A Receptor Story

Diabetes and other metabolic disorders have reached epidemic proportions. "Insulin resistance" – a pathologic condition in which cells fail to respond normally to insulin – is at the core of metabolic dysfunction. To achieve insulin resensitization, we use the physiologic insulin resensitization modality to overcome insulin resistance at the cellular insulin receptor level--in essence, bio-mimicking normal physiology.

1) Insulin is released from the pancreas in a physiologic cyclical pattern, a fact known for decades.
2) Insulin oscillations are mediated, in part, by firing of a pancreatic neuronal network that connects beta cells (Islets of Langerhans).
3) An insult (auto-immune, obesity, toxin, trauma, stress etc.) causes inflammation in the pancreas that disrupts pancreatic insulin rhythmicity.
4) When this physiologic pattern is impaired, a relative hyperglycemia results; pancreatic insulin secretion is dysregulated, and the loss of troughs results in relative hyperinsulinemia.
5) Hyperinsulinemia triggers a negative feedback loop and essentially functions as a toxin to insulin receptors; insulin receptors downregulate, refract, and unopposed glucagon decreases transcription of receptors.
6) **Inadequate receptor function is the phenotype of insulin resistance** and ultimately leads to metabolic disorders; genetics and/or differential receptor dysfunction determine the presenting symptoms, which most often include development of diabetes and many other metabolic disorders.
7) Peripheral precision administration of physiologic insulin intravenously (*i.e.* physiologic insulin resensitization) replaces these lost signals in an effort to re-sensitize receptors to insulin by bio-mimicking the normal pancreatic axis.
8) When exposed to a dynamic rhythm of bioidentically randomized physiologic insulin, receptors upregulate, and the ability to metabolize carbohydrates while decreasing fat metabolism inflammation is temporarily restored.
9) Binding of insulin to receptors facilitates the uptake of glucose into cells which can relieve hyperglycemia (if present); once inside the cell, glucose is readily processed (metabolized) through oxidative phosphorylation (TCA cycle) and other pathways to produce adenosine triphosphate (ATP), also known as cellular energy.
10) As cellular energy from carbohydrate metabolism becomes more readily available, energy-starved tissues can undergo growth and repair (cellular restoration). Neuronal tissues in particular are extremely sensitive to decreases in energy from carbohydrate metabolism.