Short-term oxygen administration restores blunted baroreflex sensitivity in patients with type 1 diabetes
Bernardi et al. (2011)

They found that slowing the breath to 6 breaths/min increased the baroreflex sensitivity (BRS) of type-1 diabetics, making their BRS look more like a control group. Abnormal BRS has been shown to be an early indicator of cardiovascular autonomic disorder. However, an even more interesting aspect of this study is that they hypothesize (as do several other studies) that tissue hypoxia is a big cause of diabetic autonomic disorders. Thus, by breathing slowly and letting CO2 accumulate in the blood, the tissue hypoxia is alleviated, which could have major implications for long-term complications associated with diabetes. This is likely one reason I felt so great when switching to the Oxygen Advantage…my tissue hypoxia was finally alleviated.

Oxygen-induced impairment in arterial function is corrected by slow breathing in patients with type 1 diabetes
Bernardi et al. (2017) (Nature)

This one builds from the previous and was one of the most important papers I've read about the positive effects of slow breathing on diabetes. They compared the impacts of slow breathing and hyper-oxygenation on several biomarkers in diabetics. Slow breathing was the most effective for increasing BRS and blood O2 saturation while also showing no side effects (oxygen administration increased blood pressure). I think the summary (and really just the last sentence) from the abstract gives the take-home message nicely (I've removed some for brevity and emphasis):

"*During normoxic spontaneous breathing diabetic subjects had lower BRS and SAT, and worse arterial function. Hyperoxia and slow breathing increased BRS and SAT. Hyperoxia increased blood pressure and worsened arterial function. Slow breathing improved arterial function and diastolic blood pressure. […] Slow breathing-induced improvement in BRS may result from improved SAT, reduced sympathetic activity and improved vascular function, and/or parasympathetic-driven antioxidant effect. Lower oxidative stress could explain blunted effects in controls. Slow breathing could be a simple beneficial intervention in diabetes.*"

High prevalence of spirometric abnormalities in patients with type 1 diabetes mellitus
Suresh et al. (2011)

This study was fascinating because it showed that diabetics generally have pulmonary dysfunction. They did not have a control group, so their measurements were compared to "standard values". Nonetheless, the diabetic group they tested showed several pulmonary abnormalities:

"*To conclude, pulmonary function abnormalities detectable on spirometry are common in type 1 DM patients. A restrictive ventilatory disturbance appears to be the predominant pattern observed. Further extreme stunting as a result of childhood onset type 1 DM is associated with very high prevalence of restrictive ventilatory disturbances.*"

Lung function abnormalities in children with type I diabetes
Van Gent et al. (2002)

This one is along those same lines, but for children. I think their final summary says it all:

"*Our data show that increase of airway resistance do occur in children with type I diabetes. Data in literature suggest increase of lung function abnormalities during later life, especially decrease of lung volumes and carbon monoxide diffusing capacity. A long-term follow-up study in larger groups of patients is needed to describe the relationship between lung function abnormalities and the duration and severity of the disease. Progressive abnormalities in lung function might interfere with the promising results of treatment with intrabronchial administration of insulin.*"

Thickness of the basement membrane of bronchial epithelial cells in lung diseases as determined by transbronchial biopsy
Watanabe et al. (1997)

This study really "sealed the deal" as to why the Oxygen Advantage and Buteyko concepts have helped me so much. It turns out that diabetes and asthma have many similarities. In fact, this study looked at basement membrane thickness in patients with diabetes, asthma, idiopathic pulmonary fibrosis, bacterial pneumonia, pulmonary tuberculosis, sarcoidosis, and even lung cancer. Only diabetes and asthma led to larger basement membrane thickness!

"*The basement membrane thickness in patients with diabetes mellitus or bronchial asthma appeared thicker than in patients with lung cancer, idiopathic pulmonary fibrosis, bacterial pneumonia, pulmonary tuberculosis or sarcoidosis. […] As reported previously, the basement membrane in patients with bronchial asthma was significantly thicker than in patients without bronchial asthma (8.193+-1.362 vs 5.145+-0.233, P=0.0180) (mean +- SEM). Also, the basement membrane in patients with diabetes mellitus was significantly thicker than in patients without diabetes mellitus (7.217+-0.753 vs 4.968+-0.235, P=0.0038).*"

Another paper also found similar results, and concluded that oxidative stress (which can be mitigated with Oxygen Advantage techniques) were the cause:

"*We concluded that oxidative stress is present in experimental DM, and that structural alterations in the pulmonary tissue are observed, as are alteration in blood gases.*"