FREEDOM MEDITECH
Technologies for a Free and Healthy Life

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SCIENTIFIC RATIONAL FOR SCREENING PATIENTS USING AUTOFLUORESCENCE TO IDENTIFY PATIENTS WHO MAY HAVE DIABETES

Glucose in the body reacts with the lysine groups in proteins to produce glycated proteins. Over time, these glycated proteins react further to produce Advanced Glycated Endproducts (AGE). Proteins in the lens of the eye do not turnover and therefore give an indication of the average glucose levels over a very long period of time. These AGEs have a unique fluorescence. Many studies have documented that the AGEs in the lens rise steadily over time. These studies have also shown that people with diabetes have much higher levels of AGE in their lens compared to age-matched patients without diabetes.

Freedom Meditech has patented and tested a device that can be used to measure the AGEs in patients as part of a routine optical exam. If a patient's AGEs are elevated compared to age-matched controls, then they are candidates for a further work-up to determine if they have diabetes. Incorporation of this testing into routine eye exams or in health screening events could potentially identify people with diabetes much earlier than they would have otherwise been diagnosed. Data indicates that people with Type 2 diabetes go undiagnosed for 7 years or more before they are diagnosed with their disease (13). This could have a very great savings for this patient and the healthcare system, since an earlier diagnosis leading to an earlier treatment has the potential to decrease the costs of diabetes complications which worsen the longer a patient goes un-diagnosed.

A large number of authors have demonstrated that lens fluorescence is greater in diabetic patients compared to patients without diabetes (1, 2, 3, 4, 5, 6, 7, 8, 9). Many of these authors proposed that this increased lens autofluorescence was due to the accumulation of AGEs and served as an index of long-term glycemic control. This hypothesis was substantiated in studies by Monnier and Cerami (10), Abiko et. al. (11), and Yu et. al. (12).

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