



**CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY**

<b>Name(s)</b> <b>Matthew P. Saenz</b>	<b>Project Number</b> <b>S0423</b>
<b>Project Title</b> <b>Diabetes Won't Keep Me Down: Can Modern Technology Improve Diabetic Control?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Type-2 Diabetes is a prevalent issue in today's society. Recent estimates have placed 25.8 million people -- in the U.S. alone with this condition, and a further 70.9 million as "pre-diabetic." Diabetes is measured by taking the hemoglobin A1C percentages, which measures the amount of glucose attached to a hemoglobin molecule. The objective was to determine the effectiveness of an informative website on improving the diabetic control in patients. It is hypothesized that this form of access will improve diabetic control. <b>Methods/Materials</b> 21 subjects (10 male 11 female), based on the time of their last HA1C test (at least 2 months prior) and diabetic control, were asked and selected to be a part of the study by their doctor. All personal information (except gender, age and HA1C level) was withheld. Upon agreement, verbal and written instructions on how to view the website, along with a signature of consent form were given. For 1 month, the website was updated three times a week, and the subjects were asked to visit the site at least once a week. This website showcased facts about their condition and diet and exercise regimens. After the month, the subjects notified their doctor on the number of times the website was viewed, and their blood was retested. A survey was also collected on the subjects' opinions on the website. The old and new HA1C tests were analyzed, and the percent change was compared with other subjects. <b>Results</b> 21 subjects completed the study. 18 out of 21 subjects reported improvement in their HA1C levels. Overall, the average HA1C level decreased after viewing the website (7.38 to 7.13). The average percent change was a decrease of 4.25% (based off the original A1C level). Upon further analysis, a positive correlation between the number of times subjects viewed the website, and greater percent change in HA1C was found. In addition, male subjects had a higher average percent decrease compared to females, and subjects aged 56 and older had a higher average percent change compared to those 55 and younger. <b>Conclusions/Discussion</b> The hypothesis was supported. Nearly 86 percent of subjects with a long history of poor diabetic control improved, which is highly encouraging. In the future, more subjects over a longer period of time would be used. Optimally, a partnership with the local hospital in developing an education plan using websites would be established.	
<b>Summary Statement</b> This project determined the effectiveness of modern technology (an informative website) on the diabetic control of patients with poorly-controlled diabetes.	
<b>Help Received</b> Dr. Chae recruited subjects; Father helped construct board	