



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Michael J. Vredenburg	Project Number S0327
Project Title Pharmaceutical Safety: Risk, Perception, and Drug Adherence	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals In 1996, Congress passed a law stating that medications must be accompanied by "meaningful" written information. Patients' perception of a drug's risk can determine whether or not they read the form, or how much of it they choose to read. There is strong evidence supporting the importance of expectations on warning efficacy. Specifically, warning effectiveness tends to increase as a function of perceived hazardousness and likelihood of injury. One of the most dangerous commonly prescribed medications is Warfarin, which has a low, or narrow therapeutic index. This means that even a small excess of two to two and a half times normal can be fatal in 50% of the population. A primary aim of this study was to evaluate how the format of information sheets influences risk perception and drug adherence.</p> <p>Methods/Materials I created an experimental information sheet for Warfarin for this study by reformatting existing sheets to comply with results of my prior science fair research and compared it to 2 existing sheets (one commonly used by pharmacy chains and one by the U.S. Food and Drug Administration [FDA]) using a comprehension test that I developed for the study. I used 2 Likert-type scales to evaluate risk perception, and likelihood of injury.</p> <p>Results I compared 2 existing information sheets to my experimental sheet using a repeated measures ANCOVA (using age as a covariate). I found that as the perception of risk increased, performance on a test increased when the information sheet was difficult to use. I also found that more than a third of the participants did not even realize that the information under the heading "precaution" was warning information. Results indicate that participants underestimated risk for all formats, which could potentially result in serious injury or death. Moreover, participants felt that the likelihood of injury using the drug was even lower than their perception of how dangerous it was.</p> <p>Conclusions/Discussion Since seniors use significantly more drugs, and the more drugs taken the greater risk of injury, it is critical that these sheets are redesigned to accurately convey risk to seniors, and all population groups. Warnings research indicates that the two factors affecting warning compliance are likelihood and severity of injury; these factors were evaluated to be moderate by all groups studied.</p>	
Summary Statement My research evaluated why people fail to read information sheets provided with prescription medications. I examined their risk perceptions of a dangerous drug and the accuracy of these perceptions.	
Help Received Pharmacist Philip Anderson (UCSD) provided pharmaceutical expertise. Michael Kalsher (RPI) helped with statistics and let me collect data in his classes. Family Dr. Randy Cohen provided medical expertise. A senior housing facility allowed me to collect data at their facility.	