



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Michael J. Vredenburg	Project Number S0321
Project Title Patient Safety: Testing the Effectiveness of Patient Medication Information Sheets in Communicating Pharmaceutical Risk	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This study evaluated whether pharmacy patient medication information (PMI) sheets effectively communicate pharmaceutical safety information. Pharmacies rely on PMI sheets to meet state and federal requirements. PMI sheets have few rules about format and content and are supposed to be written at a sixth grade level. Adverse drug events have resulted from patients' limited literacy skills; the elderly are particularly susceptible. Nearly half of Americans face a higher risk of health problems due to difficulty understanding medical terms.</p> <p>Methods/Materials There were 439 total participants: 252 female and 187 male. Ages ranged from 11 to 87. Students ranged from grades 7 through 12. Adults ranged from high school graduates to having college graduate degrees. A Medication Labeling Comprehension test was developed for this study. Participants also completed a commercially available, validated reading level placement test purchased for this study. Both tests were administered together. Student tests were distributed during class. Adult tests were completed at airports by waiting passengers. Test completion time was 20-30 minutes.</p> <p>Results Overall participants were incorrect 31% of the time even though participants could view the PMI sheets while responding to questions. There was a significant increase in performance on the test as age ($F(40,398)=2.393, p<.01$), grade ($F(9,428)=8.28, p<.01$), and reading level ($F(26,410)=10.207, p<.01$) increased. People of all ages and reading levels missed safety-critical items. Females performed better than males ($t(436)=-2.74, p<.01$). Honors English students performed better than students in regular English classes ($t(389)=-6.493, p<.01$). Reading level, gender, and whether participants were honors students predicted 32% of performance variability on the Medication Labeling Comprehension test, $R^2=.324, F(3,386)=61.56, p<.01$.</p> <p>Conclusions/Discussion Performance on the test was lower than expected. Even college-educated participants with a reading level well above the government required sixth grade level made life-threatening errors. Future research is needed to identify factors that will increase comprehension by people with limited English skills and low literacy levels. This study indicates that PMI sheets should be redesigned to have a larger font, well-defined terminology, and explicit instructions written at a level that can be comprehended by people with limited literacy.</p>	
Summary Statement This study assessed comprehension of pharmacy patient medication information sheets and found that they fail to effectively communicate critical pharmaceutical safety information.	
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