CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
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Project Number
J1009

Project Title
Radiation: Silent Killer, or Life Saver?

Abstract

Objectives/Goals
My experiment's question was, "Can a person receive harmful levels of radiation by visiting a hospital, oncology center, a radiologist, surgery center, or a doctor/dentist office?" I hypothesized yes; visitors and workers could receive harmful levels of radiation at our chosen locations because anyone administering a test involving radiation, the patient receiving the test, or everyone in the area of the test would receive some level of radiation. I used the U.S. Government standard of acceptable exposure for occupational and non-occupational radiation as measurement of "harmful."

Methods/Materials
I rented a Geiger counter, a machine that measures the amount of radiation in the air, and measured the gamma ray radiation at sixteen locations which included two oncology centers, a hospital, dentist office, two medical buildings, and a surgery center. I put the Ludlum MuR Meter in a large handbag and went as close to the source of radiation as I could and wrote down my datum.

Results
I then used an equation in order to figure out what the amount of radiation that was received at each indiviual location independently. First, take the reading of what you received in MuR. Next, multiply it by the time you were irradiated in seconds. We used 40 seconds to have a consistant equation. Next, multiply it by your variables. For our example involving a oncology center, we multiplied the numbers by 4 repetitions multiplied by 30 patients a day and then multiplied it by 240 for what we estimated would be a technicians days worked per year. Finally, take your answer and divide it by 3600 seconds per hour = the MuR exposure projected over a year.

Conclusions/Discussion
I discovered that the amount of radiation was so small at each location that a visitor or a technician exposed for an entire year never reached the government's non-occcupational level of "harmful" and never came close to the "occupational" level the government allows for technicians. Therefore, I disproved my hypothesis!

Summary Statement
To discover whether there is harmful levels of radiation visiting a hospital, oncology center, a radiologist, surgery center, or doctor/dentist office.

Help Received
Mother helped edit experiment and drove the car, Christopher Westbrook, our physicist, let me into the oncology center and gave me advice how to carry out the experiment.