

*Using a Computer Kiosk to Promote Child Safety:  
Results of a Randomized Controlled Trial in an  
Urban Pediatric Emergency Department*

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# Epidemiology of Injuries to Children

- Injuries kill one million children world-wide annually
- In the United States injuries are the leading killer of children 14 and under
- In Baltimore each day 3 children will suffer an injury serious enough to put them in the hospital. Each year, 1 in 4 children in Baltimore, about 34,000, will see a doctor for an injury



## Low-Income Urban Children are at Increased Risk of Injury

- Childhood injury rates vary with a child's age, gender, race and socioeconomic status.
- Poverty is the primary predictor of injury risk. Despite an overall decline in injury-related death, death rates for children of low-income families continue to increase
- Previous research conducted by CIRP faculty demonstrated that children in low-income families in Baltimore City have an injury rate that is *twice* the national average



# Safety In Seconds: Study Aims

Evaluate effects of theory-based, computer-tailored intervention called Safety in Seconds, delivered in PED on car seat, smoke alarm, and poison storage knowledge and behaviors



## Why these particular behaviors?

- In 2004, 1,638 child occupants ages 14 and under died in motor vehicle crashes and an estimated 214,000 were injured as occupants in motor vehicle-related crashes.
- In 2002, 520 children ages 14 and under died due to accidental fire- and burn-related injury and an estimated 83,000 were treated in hospital emergency rooms for burn-related injuries.
- In 2002, 100 children ages 14 and under died as a result of accidental poisoning and more than 89,000 were treated in hospital emergency rooms

Data from the Safe Kids USA



## Solutions and Challenges

- Known effective safety products, such as smoke alarms, car safety seats, safe poison storage can reduce or prevent injuries when properly implemented.
- Widespread adoption of preventive interventions remains a challenge, especially for low-income families. National household survey data suggest that parents' use of safety products such as smoke alarms vary by ethnicity, education, and income



# Safety in Seconds

- Setting: Waiting area of an urban pediatric emergency room
- 10-12 minute assessment
- Personalized, tailored feedback
  
- Precaution Adoption Process Model





# Precaution Adoption Process Model

A stage theory consisting of seven distinct stages between ignorance and preventive action. The stages range from “unaware of the issue,” at stage 1 to “maintenance.” at stage 6. The theory asserts that these stages represent qualitatively different patterns of behavior, beliefs, and experience and that the factors that produce transitions between stages vary depending on the specific transition being considered.

Neil Weinstein Health Psychology 1992, 11(3), 170–180





# Adding Profiles to Stages

Each Behavior actually consist of several behavioral components

## Car Seat Example

Profile 1 – Having a car seat

Profile 2 – Having the correct car seat

Profile 3- Using it all the time

Profile 4- Having it inspected by a car seat technician



Made just for  
Don1

## Welcome to **Safety** in Seconds

This Safety in Seconds Report was created just for you and Don1. It is based on what you told us at the kiosk. Every parent answers differently so each report is special – just like Don1! The report talks about three ways to help keep Don1 safe. You will learn more about car safety seats, poisons, and smoke alarms.

You already know that most injuries to children can be prevented. Luckily, there are many things you can do to keep Don1 from getting hurt. After all, he's counting on you to keep him safe. That's why this Safety in Seconds Report is important. It only takes a few seconds to learn about safety for Don1!

## spotlight on Safety

Strong spiritual beliefs help families make decisions about how to protect and cherish their children. Using safety supplies is the best way to protect Don1 and safety supplies will keep him safe even when you can't. It only takes a second for Don1 to get hurt, even if an adult is with him. Children can move fast, and it can be hard to get to them before they get hurt. Injuries can happen quickly and having an adult in the room isn't always enough to prevent injuries.

There are many things you can do to protect Don1. Follow this report to make Don1's world safer.

## HELP is around the corner!

Need help with a child safety issue? The Children's Safety Center (CSC) is just the place for you! The CSC is a special place in the hospital just around the corner. Parents who want to know more about child safety can get help there.

The CSC has safety experts who can answer your questions. You can also call and get help over the phone. Safety products are for sale and cost less than in stores. The CSC has many free services too, like car seat checks and smoke alarms. The CSC is open Monday through Friday. Call the CSC at (410) 614-5587.



**The Children's Safety Center  
at Johns Hopkins Hospital**

The information provided is based on best practice data available at this time. It is not meant to replace information provided by your doctor or manufacturer's instructions.

## Check what you know

**Question:** *What's the leading cause of death from injuries for young children in Baltimore City?*

**Answer:** More young children under the age of 6 in Baltimore City die from house fires than from any other injury.

**Question:** *What's the best way to protect children from injury caused by a house fire?*

**Answer:** The best way to protect children from getting injured during a house fire is to have a working smoke alarm on every level of your home. Smoke alarms beep loudly if there's a fire in your home so your family will have time to get out safely. If this happens, your family should leave your home right away. Don't try to put out the fire yourself! Call 911 from a neighbor's home.

Vivian, mother of an 18-month-old: "I saw a news story the other night that said almost all of the families surveyed reported having a working smoke alarm in their home. But, when checked by experts, half of the alarms were not working at all. It made me curious about my smoke alarms. So I tested all three of them. The batteries didn't work in the one outside my bedroom, so I took care of it right away!"

## SPOTLIGHT ON Smoke Alarms

Congratulations, you have smoke alarms on every level and your batteries are fresh! You're doing everything you can do to keep Don1 and the rest of your family safe if there is a fire in your home. Here are some tips to keep in mind about fire safety.

- Check your batteries monthly.
- Make sure your family has and practices a fire escape plan.
- Change your batteries when you change your clocks in the Spring and Fall.

By doing these things, you'll help Don1 stay as safe as possible if there is ever a fire in your home. Keep up the good work!



## Take a second **LOOK**

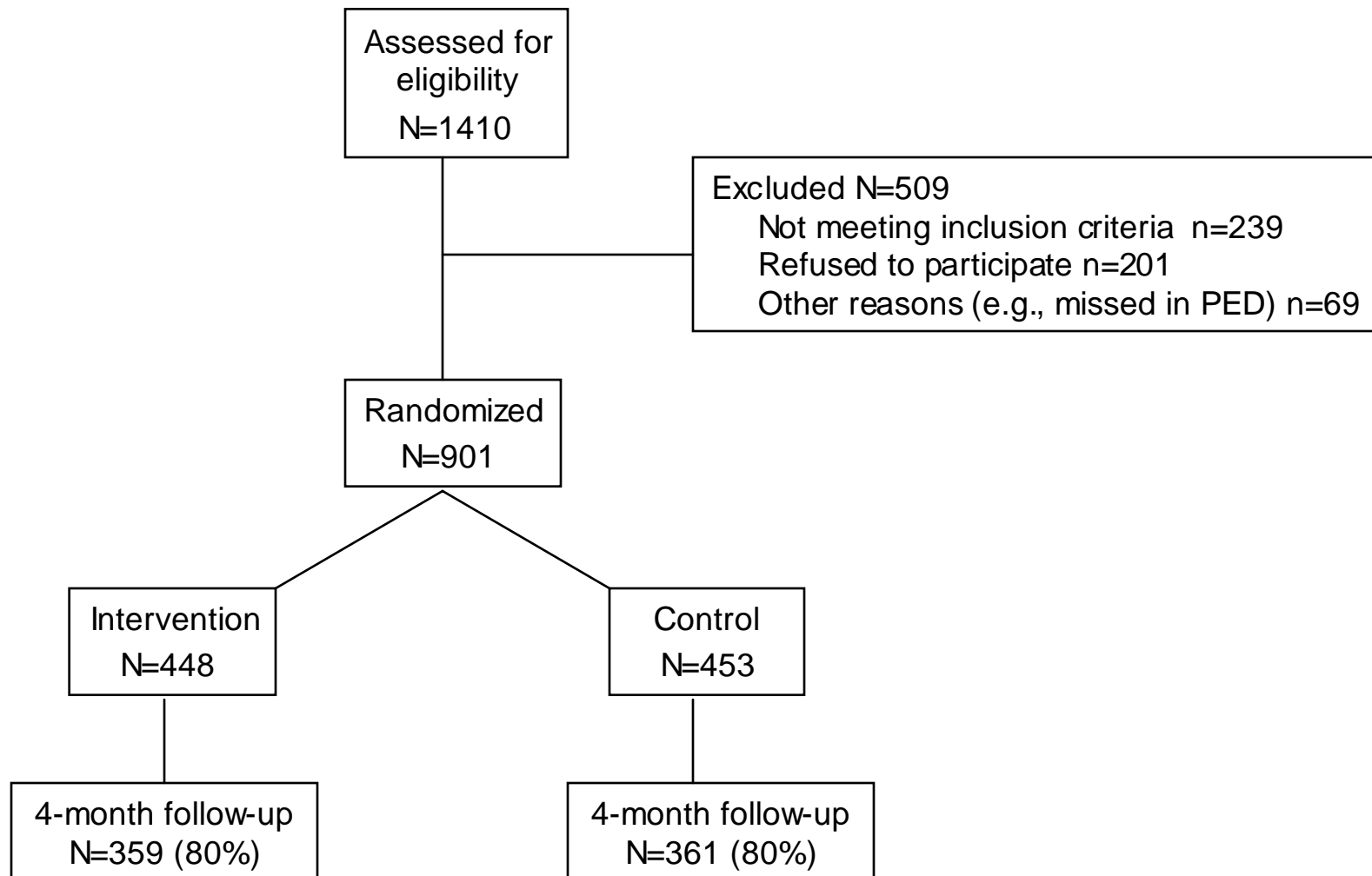
You're using your smoke alarm perfectly! You have a smoke alarm on every level of your home and you remember to change the battery in all of them twice a year. Using a smoke alarm is not hard to do, but you should feel really good about your actions. Your family and home are safer because of them. Here are a few tips for continuing to protect Don1 from a fire:

- Test each smoke alarm battery once a month to make sure it still works. When you press the button on the smoke alarm, it should beep. If it doesn't beep, replace the battery with a new one.
- Never take the battery out of a smoke alarm if it goes off while you are cooking. Instead, fan smoke away from the smoke alarm until it shuts off, or open a window until the smoke clears.

These simple steps will help keep Don1 and the rest of your family safe inside your home, and may even save their lives.



# Figure 1. Study Design





# Evaluation Methods

- Randomized controlled trial
- Personalized tailored injury prevention report vs. Personalized child health report
- 901 caretakers of children ages 4-66 months
- Telephone follow-up interview at 4 months



# Demographic Results

- 90% of participants were the mother or step mother
- 93% African American
- 31% married or living with a partner
- 72% PED for non-injury medical visit
- 63% per capita income < \$5000
- 54% employed full or part-time



# Intent to Treat Analysis

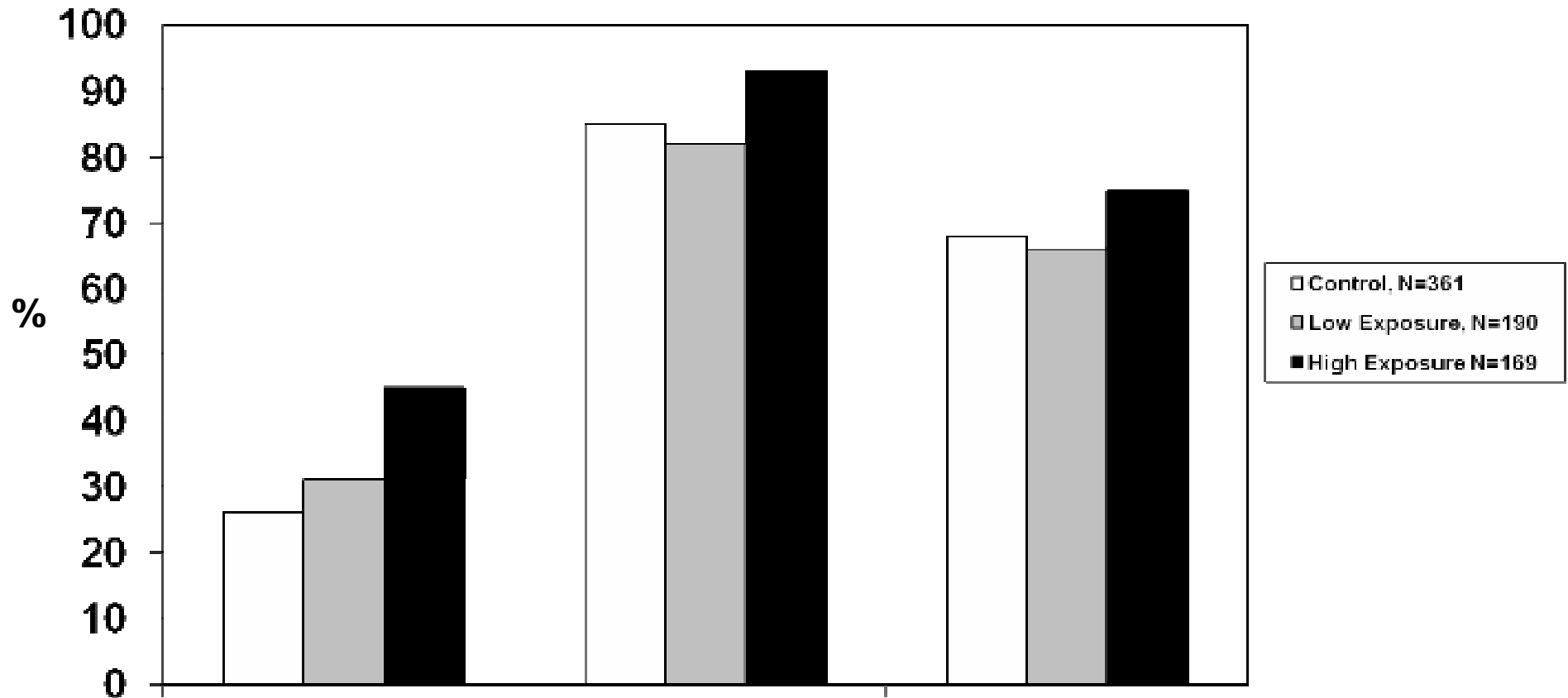
- Significant knowledge gains for smoke alarms, poison storage, and total score
- Significant effect on car seat use  
Odds Ratio (95%CI): 1.36 (1.05-1.77)



# Exposure Analysis

- 95% read at least some of the report, 62% read all of it, 67% discussed it with others
- 47% read all of it and discussed it; these caregivers significantly more likely to use:
  - Car seats 1.71 (1.22-2.46)
  - Smoke alarms 2.05 (1.08-3.87)
  - Safe poison storage (not significant) 1.46 (.91-2.16)

**Figure 2. Percent Distributions of Child Safety Seat, Smoke Alarm, and Poison Storage Outcomes by Study Group and Exposure to the Intervention**



**Child Safety Seat**

**Smoke Alarm**

**Poison Storage**

**Child Safety Seat:** Always using correct car seat, inspected or installed by expert

**Smoke Alarm:** smoke alarm on every level and changing batteries at correct intervals

**Poison Storage:** Locking poisons after each use





# Good and Bad

- Potential to prepare tailored messaging for 1000's of people at time
- Increased knowledge with no interaction from a provider
- Entire intervention relies on the accuracy of the self report
- Self reported over the phone vs. observed behaviors in the home



# Safety in Seconds: Next Steps

- Examine effect of literacy level on outcomes
- Study potential for use with other populations and in other settings
- Study utilization and impact in “real world” application
- Determine marketability of personalized and tailored safety information for consumers