

# TeenDrivingPlan

## Initial Use Evaluation of a User-Centered Designed Prevention Intervention

Flaura Winston, MD PhD  
Perelman School of Medicine,  
University of Pennsylvania  
Center for  
Injury Research and Prevention  
The Children's Hospital  
of Philadelphia



## Acknowledgment

Colleagues at CIRP and CHOP in this work.  
This material is based upon work supported by:  
National Science Foundation Accelerating  
Innovation Research; PA Dept of Health and  
State Farm Insurance Companies

PI's for TeenDrivingPlan Study:

Dennis Durbin, MD MSCE  
Jessica Mirman, PhD

3 | The Children's Hospital of Philadelphia®

While I talk...

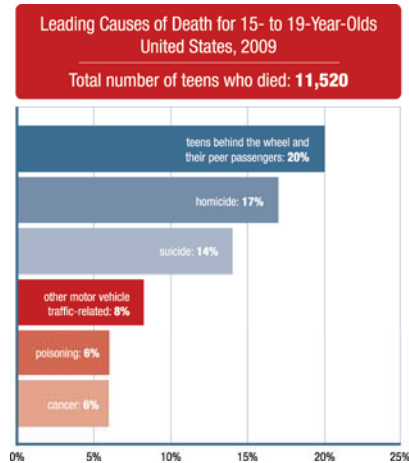
**1000**  
people under age 25  
will die  
on the world's roads.

UN Decade of Action for  
Road Safety (2011-2020)

4 | The Children's Hospital of Philadelphia®

## Deaths when teens behind wheel (US)

- One in five deaths to 15 to 19-year-olds in the U.S.
- Five times deaths due to cancer

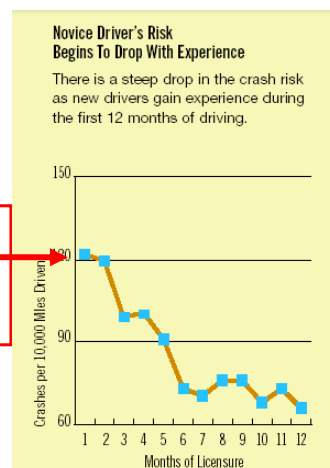


5 | The Children's Hospital of Philadelphia®

## Timeline for safety

Learner phase:  
Lowest lifetime risk of crashing

**Time Zero**  
Independent driving



6 | The Children's Hospital of Philadelphia®

## Main causes for novice teen crashes

- Inexperience
    - Too fast/too close
    - Poor scanning
  - Distraction/inattention
- Need: improve skill

### FOCUS OF THIS PREVENTION INTERVENTION:

- **Improve the skills** of novice teen drivers through **improved practice driving**

7 | The Children's Hospital of Philadelphia®

## CIRP Process for Web Interventions

1. Design
  - Grounded in theory & formative research
2. Execution
  - Grounded in user-centered design & testing; process evaluation; revision
3. Evaluation
  - Grounded in clinical trials BUT pragmatic
4. Dissemination
  - Grounded in Web marketing
5. Monitoring and revisions

8 | The Children's Hospital of Philadelphia®

## CIRP Process for Web Interventions

1. Design
  - Grounded in theory & formative research
2. Execution
  - Grounded in user-centered design & testing; process evaluation; revision
3. Evaluation
  - Grounded in clinical trials BUT pragmatic
4. Dissemination
  - Grounded in Web marketing
5. Monitoring and revisions

9 | The Children's Hospital of Philadelphia®

## TeenDrivingPlan – 1. Design Theory & Formative Research

### Behavioral Objective

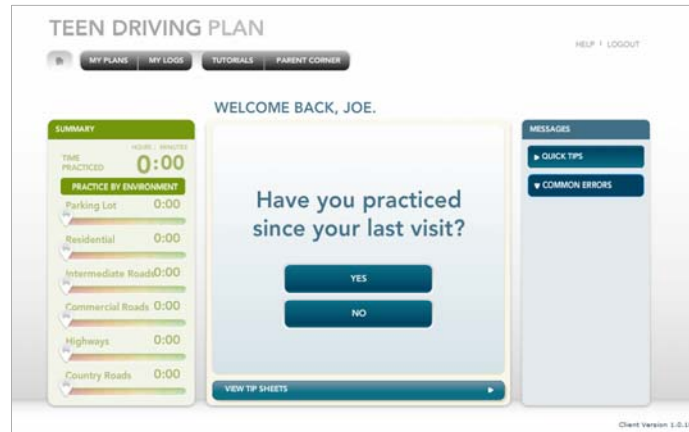
Improve *quantity, quality, and diversity* of teens' practice driving.

### Target Constructs

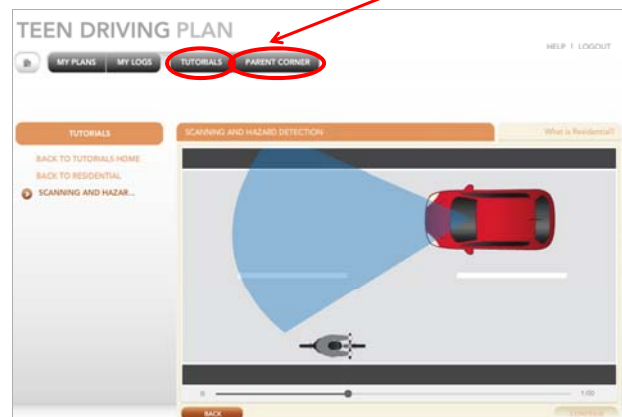
- Parent Knowledge – Common errors, practice activities, and signs of mastery
- Parent-Teen Relationship Quality – Warmth, trust and social support
- Parent Practice Facilitation Skills – Plans, logs, and provides feedback
- Parent Perceived Barriers to Practice
- Parent Self-Efficacy

10 | The Children's Hospital of Philadelphia®

## TeenDrivingPlan – 2. Execution Home Page



## TeenDrivingPlan – 2. Execution Parent Corner & Library of Tutorials



## TeenDrivingPlan – 2. Execution Practice Planner: Environments/Goals

**TEEN DRIVING PLAN** HELP | LOGOUT

MY PLANS | MY LOGS | TUTORIALS | PARENT CORNER

**PLAN A PRACTICE DRIVE**

MY PLANS

- PLAN A PRACTICE DRIVE
  - Select Plan
  - Name Plan
  - Select Environments
  - Select Goals
- BUILD CUSTOM TUTORIAL
- VIEW TUTORIAL
- ADD NOTES
- SUMMARY

Select Goals

Which goals would you like to practice?

Environment	Goal	Prior Goal Performance
Parking Lot	<input type="checkbox"/> Introduction to Scanning	---
	<input type="checkbox"/> Stopping and Starting	---
	<input type="checkbox"/> Introduction to Lane Positioning	---
	<input checked="" type="checkbox"/> Backing Up	---
Residential	<input type="checkbox"/> Controlled Interactions	---
	<input type="checkbox"/> Driving Straight	---
	<input type="checkbox"/> Scanning and Hazard Detection	---
	<input checked="" type="checkbox"/> Speed Management I	---
	<input type="checkbox"/> Uncontrolled Interactions	---
	<input checked="" type="checkbox"/> Turning	---

BACK CONTINUE

## TeenDrivingPlan – 2. Execution Tip Sheets

**TEEN DRIVING PLAN** HELP | LOGOUT

MY PLANS | MY LOGS | TUTORIALS | PARENT CORNER

**First Plan**

MY PLANS

- PLAN A PRACTICE DRIVE
- BUILD CUSTOM TUTORIAL
- VIEW TUTORIAL
- ADD NOTES
- SUMMARY

VIEW PLAN

ENVIRONMENTS

- Parking Lot
- Residential

GOALS SELECTED

- Backing Up [VIEW TIP SHEET](#)
- Speed Management I [VIEW TIP SHEET](#)
- Turning [VIEW TIP SHEET](#)

NOTES ABOUT THE DRIVE

**Speed Management I**

The purpose:  
Help the new driver control how fast the car should be traveling.

The activity:  
Practice maintaining a safe and consistent speed while only glancing at the speedometer.

Common Errors:

- Speed may fluctuate greatly at first
- New driver may fixate on the speedometer

Sign teen gets it:

- Maintains an appropriate and steady speed

PRINTABLE TIP SHEET

BACK CONTINUE

## TeenDrivingPlan – 2. Execution Practice Logger

Practice Drive #13

LOGGING PRACTICE DRIVE

DRIVE DETAILS

ENVIRONMENTS

Residential: 0 minutes

Highways: 0 minutes

Total: 0 minutes

GOALS

Speed Management I

Lane Changing on Highways

DATE & TIME

Date: [ ]

Time: 12:00 pm

DRIVING CONDITIONS

Weather: [ ]

Roads: [ ]

Was it dark? [ ] No [ ] Yes [ ] Partially

WHO DROVE WITH THE TEEN?

Mentor: [ ]

ATMOSPHERE IN CAR

Stressful [ ] Calm [ ] Positive [ ]

Comments About Atmosphere

NOTES ABOUT THE DRIVE

BACK

CONTINUE

Click on the Slider to enable the continue button

CHIEF VERSION 1.1

15 | The Children's Hospital of Philadelphia®

## TeenDrivingPlan – 2. Execution Summary – Driving Practice Log



16 | The Children's Hospital of Philadelphia®



## TeenDrivingPlan – 3. Evaluation

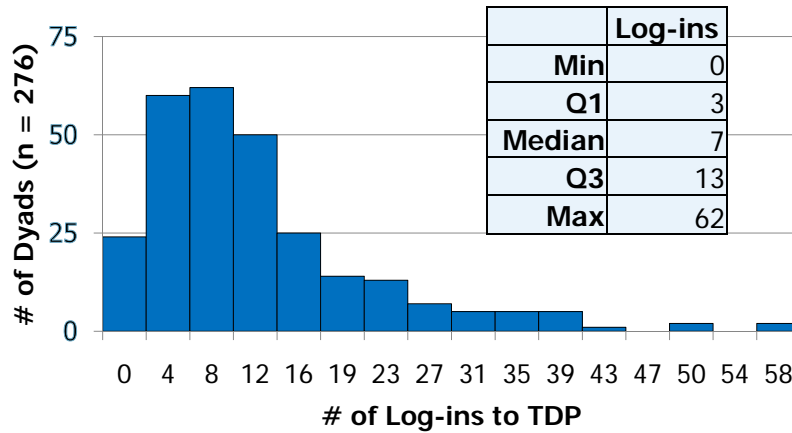
### Grounded in clinical trials model

- Study design
  - 2-arm randomized trial; pragmatic control group; longitudinal (6 months total); 520 parent/teen dyads
- Process Outcomes
  - Detailed use statistics – **FOCUS OF THIS TALK**
- Intermediate & Main Outcomes
  - Goal: Skill mastery
  - Behavior: Practice driving (diversity, quality, quantity)
  - Target constructs: e.g., parent facilitation skills

## GENERAL USE STATISTICS

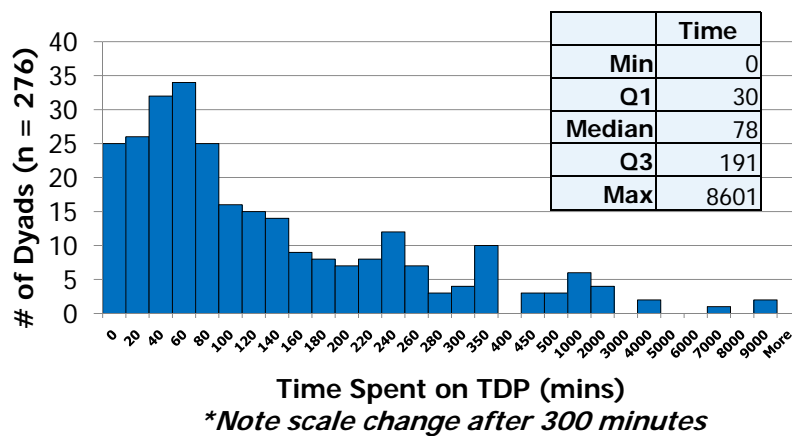
(FIRST 276 PARENT/TEEN DYADS)

## Number of log-ins Skewed distribution



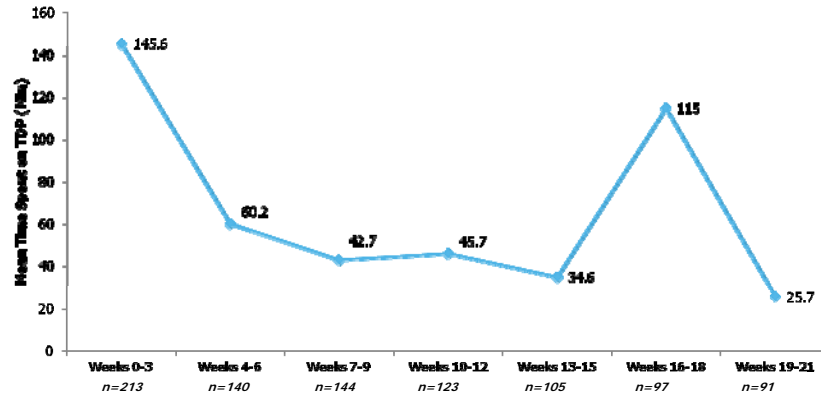
19 | The Children's Hospital of Philadelphia®

## Time on site Skewed distribution



20 | The Children's Hospital of Philadelphia®

## Use of site by week in study Drop off over time



Note: Limited to dyads logging-in at least once (91% of total)

## SPECIFIC USE STATISTICS

## Which components were used?

- 1,982 total tutorial videos viewed
  - Per dyad (Median=5)
  - 7 of 50 tutorial videos represented ~50% of all tutorials viewed
- 393 total planned drives
  - Per dyad (Median=1)
- 4,902 total logged drives
  - Per dyad (Median=9)

## Conclusions

- Extensive formative research, user-centered design and a process evaluation, but...
  - Limited use, use dropped off over time
- Typical use:
  - Watched videos & logged drives
  - Little planning
- Long tail – some high users – who were they?
  - Inherent planners?
  - Were they more motivated (challenges)?

## Lessons learned

- Watch > Log > Plan
  - Most passive activity is most common
- Prevention intervention may require more than Web
  - Need incentives/reminders/human?
- Tracking specific use is essential
  - Helps to guide future development
- Randomized trial was successful, but might benefit from other designs