

Pediatrician and Parent CPS Knowledge and Practices Following Revised AAP Policy

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OUTLINE

- Burden of motor vehicle crash-injury in children and youth
- Current best-practice recommendations for child restraints, with corresponding evidence base
- Pediatricians' knowledge, attitudes, and beliefs about child passenger safety
- Parental child passenger safety attitudes and practices

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Dedicated to advancing the safety of children, youth and young adults through research & action.
 (injury.research.chop.edu)

- **Comprehensive**
 From Before-the-Injury prevention
 To After-the-Injury healing
- **Interdisciplinary**
 Clinical medicine, public health, epidemiology, behavioral science and engineering
- **Engaged**
 Large network of partnerships with universities, government, industry
- **Translational**
 Tangible tools & recommendations grounded in science, designed for impact

CENTER FOR INJURY RESEARCH & PREVENTION

CIRP Pediatric Injury Research Priorities:

- Child Road Traffic Safety
- Young Driver Safety
- Pediatric Biomechanics
- Post-injury Care & Recovery
- Strengthening Communities to Prevent Injury/Promote Health

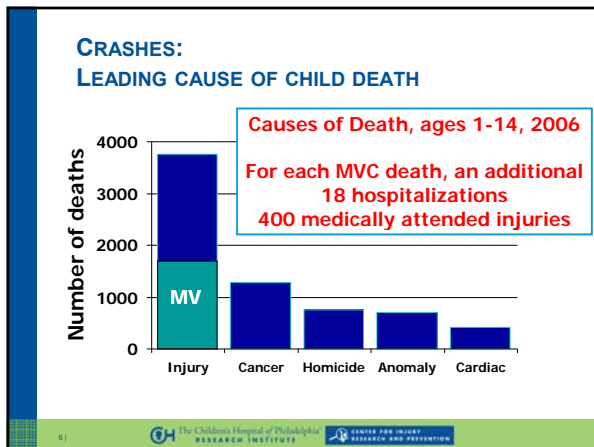
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Leading causes of injury deaths in 2010

Rank	<1	1-4	5-9	10-14	15-24
1	Unintentional Suffocation 905	Unintentional Drowning 426	Unintentional MV Traffic 354	Unintentional MV Traffic 422	Unintentional MV Traffic 7,024
2	Homicide Unspecified 154	Unintentional MV Traffic 343	Unintentional Drowning 134	Suicide Suffocation 168	Homicide Firearm 3,889
3	Homicide Other Spec. classifiable 82	Homicide Unspecified 163	Unintentional Fire/Burn 89	Unintentional Drowning 117	Unintentional Poisoning 2,183
4	Unintentional MV Traffic 76	Unintentional Fire/Burn 151	Homicide Firearm 58	Homicide Firearm 107	Suicide Firearm 2,046
5	Undetermined Suffocation 39	Unintentional Suffocation 134	Unintentional Suffocation 31	Suicide Firearm 80	Suicide Suffocation 1,824
6	Unintentional Drowning 39	Unintentional Pedestrian, Other 103	Unintentional Other Land Transport 26	Unintentional Suffocation 48	Unintentional Drowning 656

CDC 2012

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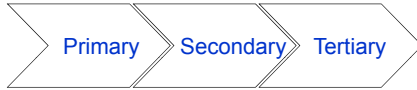
Motor Vehicle Injuries: A Winnable Battle

- 1 of 10 'Winnable Battles' from the CDC, which includes
 - Child occupant protection
 - Teen Driving



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TRAFFIC INJURY PREVENTION



Disease	↓Risk ↓Crash	↓Injury incidence & severity	↑Survival ↑Recovery ↓Recurrence
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THE 'E'S OF INJURY PREVENTION

- Engineering
- Education
- Enforcement
- Economics

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A HISTORY OF CHILD PASSENGER SAFETY



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A HISTORY OF CHILD PASSENGER SAFETY

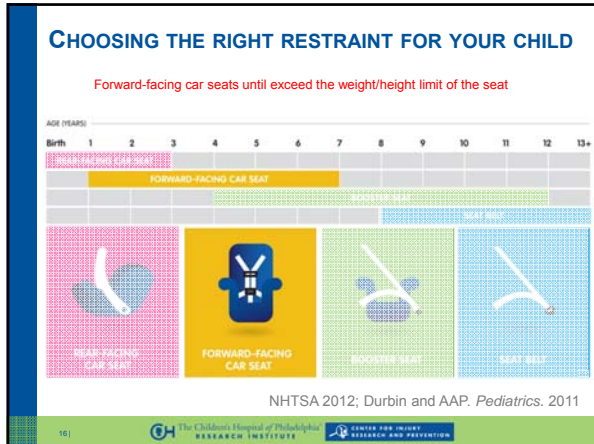


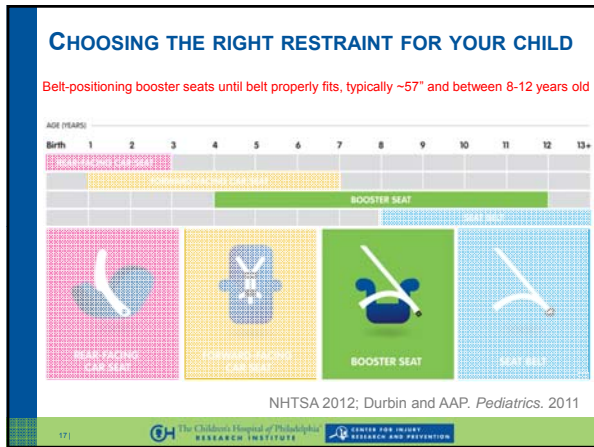
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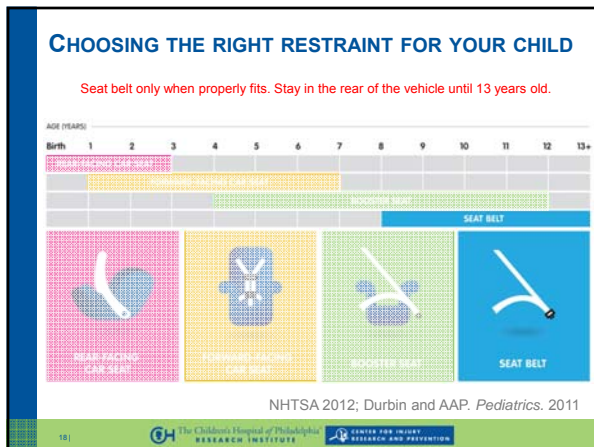
FIRST CHILD RESTRAINTS



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WHERE DO WE GO FROM HERE? FUTURE PRIORITIES

- Increase restraint use among harder-to-reach populations
- Increase age-appropriate restraint use
 - Role of pediatricians in providing evidence-based recommendations to families
- Optimizing the rear seat

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CHOOSING THE RIGHT RESTRAINT FOR YOUR CHILD

AGE (YEARS)
Birth 1 2 3 4 5 6 7 8 9 10 11 12 13+

REAR-FACING CAR SEAT FORWARD-FACING CAR SEAT BOOSTER SEAT SEAT BELT

REAR-FACING CAR SEAT FORWARD-FACING CAR SEAT BOOSTER SEAT SEAT BELT

NHTSA 2012

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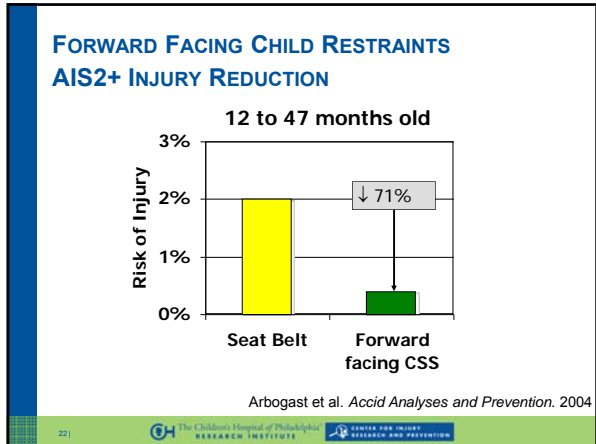
FORWARD FACING CHILD RESTRAINTS FATALITY REDUCTION

- 54% fatality reduction – compared to unrestrained (Hertz 1996)
- Fatalities from Fatality Analysis Reporting System, non-fatalities from National Automotive Sampling System (NASS)
 - Crashes from '98 to '03, children 2-6 years

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graph LR; A[Seat Belt] -- "↓ 28%  
↓ 21% even when include gross misuse" --> B[Child Restraint]
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Elliott et al. *Arch Pediatr Adol Med.* 2006

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RELATIVE RISK OF INJURY IN A FORWARD-FACING RESTRAINT COMPARED TO A REAR-FACING RESTRAINT

	Frontal Crashes	Side Crashes	All Crashes
All Ages	1.23 (0.95 to 1.59)	5.53 (3.74 to 8.18)	1.76 (1.40 to 2.20)
0-11 mo	Small sample	2.75 (1.81 to 4.18)	1.79 (1.18 to 2.72)
12-23 mo	6.16 (3.98 to 9.51)	Small sample	5.32 (3.43 to 8.24)

Henary et al. *Injury Prevention*. 2007

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Henary et al. *Injury Prevention*. 2007

SWEDISH DATA

- Current practice
 - Rear facing up to 4 years
 - Transition directly to booster seat
- Study of 454 children, age 0 to 4 years (Jakobsson 2005)
 - 5 clinically significant injuries
 - Injury reducing effect of rear facing child restraints – 90%



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CHOOSING THE RIGHT RESTRAINT FOR YOUR CHILD

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REAR-FACING CAR SEAT																
				FORWARD-FACING CAR SEAT												
								BOOSTER SEAT								
												SEAT BELT				



NHTSA 2012

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CHOOSING THE RIGHT RESTRAINT FOR YOUR CHILD

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											SEAT BELT				




NHTSA 2012

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INJURIES TO CHILDREN IN BELTS SEAT BELT SYNDROME

- Poorly positioned lap and shoulder belts
- Submarining or flexion about belt
- Injuries
 - Spine
 - Abdomen



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THE SOLUTION

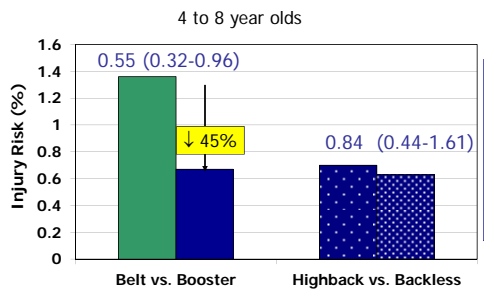
Booster Seat



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BELT-POSITIONING BOOSTER SEATS AIS2+ INJURY REDUCTION

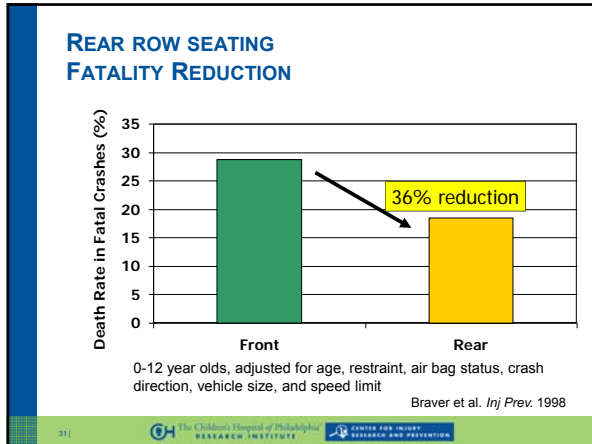
4 to 8 year olds

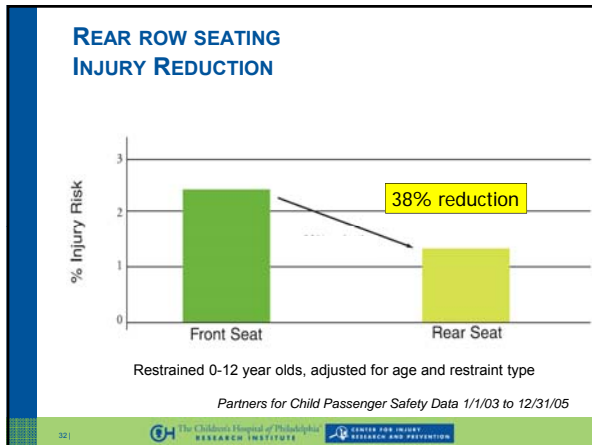


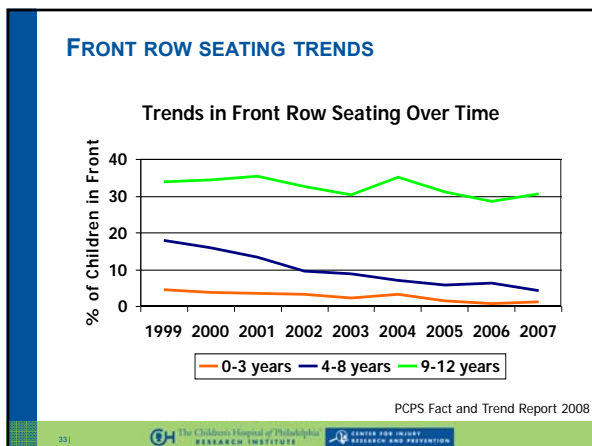
Comparison	Injury Risk (%)	95% CI
Belt vs. Booster	0.55	(0.32-0.96)
Highback vs. Backless	0.84	(0.44-1.61)

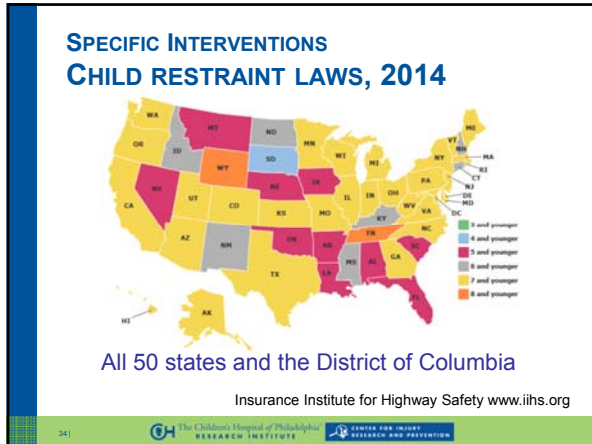
Arbogast et al. *Pediatrics*. 2009

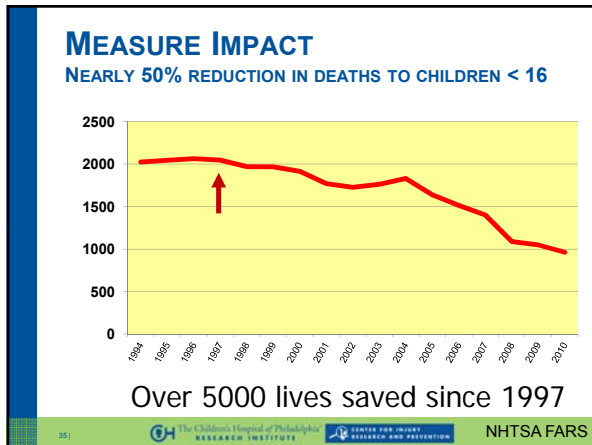
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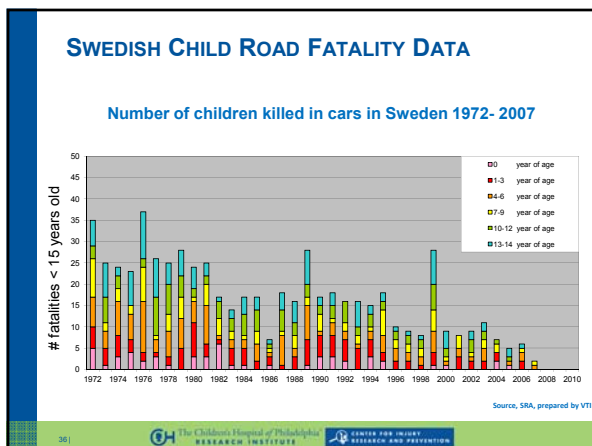






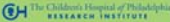









ROLE OF ANTICIPATORY GUIDANCE

- Pediatricians among primary sources cited by parents for information on CPS (Morrongiello 1995; O'Neil 2013)
- High parental knowledge about age and size/specific restraints associated with more appropriate restraint use (Bilston 2008)

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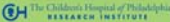

ROLE OF ANTICIPATORY GUIDANCE

- Prior research has shown that pediatric primary care providers have variable knowledge and attitudes regarding road traffic safety
 - More frequent practices and beliefs about effectiveness of efforts for infants and toddlers (Brixey 2009; Rothenstein 2004)

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ROLE OF ANTICIPATORY GUIDANCE

- Injury prevention anticipatory guidance in the clinical setting has a positive effect on parental knowledge and behavior, especially for CPS (Bass 1993; DiGuseppi 2000)

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ROLE OF PEDIATRICIANS

- Pediatricians' self-reported knowledge, attitudes, and practices about child passenger safety
- Objective
 - To evaluate pediatricians' self-reported knowledge, attitudes, and dissemination practices regarding the new American Academy of Pediatrics' (AAP) child passenger safety (CPS) policy recommendations.

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ROLE OF PEDIATRICIANS



- Study Design
 - Survey distributed to pediatric primary care physicians via American Academy of Pediatrics (AAP) email distribution lists
 - Knowledge, attitudes, and practices related to current AAP CPS recommendations and the revised policy statement were ascertained

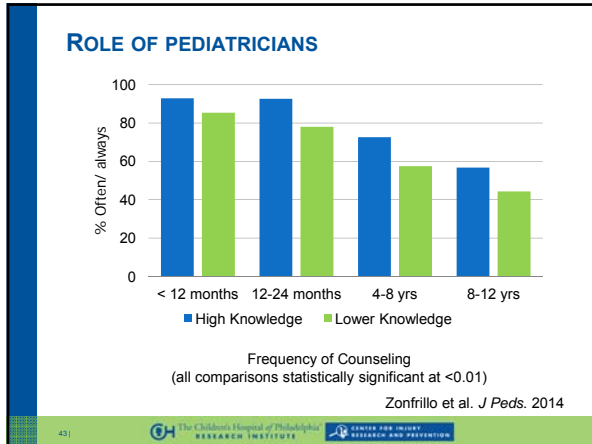
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ROLE OF PEDIATRICIANS

- 533 respondents completed the survey
- All 6 CPS knowledge and scenario-based items answered correctly by 52.9% of the sample: identified as "high knowledge" group
 - More likely to be female ($P < 0.001$), to have completed a pediatrics residency ($P = 0.03$), and have a child between 4-7 years old ($P = 0.001$)

Zonfrillo et al. *J Peds*. 2014

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- ### ROLE OF PEDIATRICIANS
- | | |
|--|---|
| <p>Most Common Barriers to evidence-based counseling</p> <ul style="list-style-type: none"> • Inadequate time- 45% • Office staff not trained- 24% • Competing priorities- 20% • Parents not interested- 20% • No resources available- 15% • Inadequate understanding- 8% | <p>Most Common strategies used to provide counseling</p> <ul style="list-style-type: none"> • Prompts in health record- 56% • Educational resources from national organization- 34% • Adequate time- 25% • Information provided by office staff- 18% • Incentive plan- 3% |
|--|---|
- Zonfrillo et al. *J Peds.* 2014

Confidence about providing recommendations for various child passenger safety topics

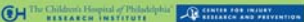
Topic	Lower knowledge	High knowledge	P value
Rear-facing car seats	87.1%	95.4%	0.001
Convertible and forward-facing car seats	74.1%	91.1%	<0.001
Booster seats	68.6%	85.7%	<0.001
When a child can use an adult seat belt without a booster seat	66.9%	86.1%	<0.001
When a child can sit in the front seat	62.4%	89.0%	<0.001

Zonfrillo et al. *J Peds.* 2014

OVERCOMING IDENTIFIED BARRIERS

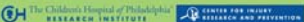
- Inadequate time
 - Utilize technology and screening
 - Kiosks in waiting room (targeted messages)
 - Prompts in electronic health records (age/size appropriate advice; 'just-in-time' education)

Zonfrillo et al. *J Peds*. 2014




CONCLUSIONS

- Although CPS knowledge is generally high among pediatricians, knowledge gaps still exist
- Knowledge associated with attitudes, practices, barriers, and facilitators of CPS guideline dissemination
- Opportunities to increase knowledge and implement strategies to routinely disseminate CPS information in primary care setting


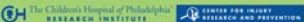


What about parental behavior and attitudes following the AAP recommendations?





AGE (YEARS)

Birth	1	2	3	4	5	6	7	8	9	10	11	12	13+
REAR-FACING CAR SEAT			FORWARD-FACING CAR SEAT			BOOSTER SEAT			SEAT BELT				



PARENTAL BEHAVIOR (O'NEIL ET AL 2013)

- **Are parents following the recommendations for keeping children younger than 2 years rear facing during motor vehicle travel?**
- Objective
 - Reports the effect of new recommendations on the observed direction of travel for infants and toddlers transported in motor vehicles between 2007 and 2012

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PARENTAL BEHAVIOR (O'NEIL ET AL 2013)

- Methods
 - Observational, cross-sectional survey of drivers transporting children collected at 25 convenience locations selected in Indiana during summer 2007 through 2012
 - Observations were conducted by Certified Child Passenger Safety Technicians

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PARENTAL BEHAVIOR (O'NEIL ET AL 2013)

- Methods
 - Drivers completed written survey
 - CPS Technician recorded the vehicle seating location, type of restraint, CSS direction and use of the CSS harness or safety belt as appropriate, and demographic data
 - Child's age and weight were collected

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PARENTAL BEHAVIOR (O'NEIL ET AL 2013)

% rear-facing

	2007-2009	2012
Birth-23 months	44.2%	59.1%
Birth-11 months	85.1%	91.6%
12-23 months	3.3%	18.2%

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PARENTAL BEHAVIOR (O'NEIL ET AL 2013)

- Conclusions
 - Counseling by primary care providers should continue and be strengthened to increase parent and caregiver awareness of the latest child passenger safety recommendations

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PARENT SURVEY - SAFEKIDS

- Survey of 1,002 parents and caregivers with children ages 10 and under
 - Use of restraints
 - Situations when they might keep
 - What they think other parents do
 - 32 questions
 - Fielded June 2013

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RESULTS

- Highest income bracket (\$100,000+)
 - More frequently responded that it was acceptable for a child to ride unrestrained
 - Situation that greatest proportion of respondents found acceptable was not driving far (34%), compared to 15% of respondents in the under \$35,000 income group (p=0.000)

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PARENT SURVEY - SAFEKIDS

- Acceptable for a child to ride unrestrained if not driving far
 - 27% of parents 18-29 years vs 19% of parents 30-49 years (p<0.001)

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PARENT SURVEY - SAFEKIDS

- Acceptable for a child to ride unrestrained if they were in a rush
 - 22% with \$100,000+ income vs. 9% with <\$35,000 (p=0.002)
 - 20% with graduate school vs 10% with high school education or less (p=0.011)

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**CHILD PASSENGER SAFETY:
FUTURE DIRECTIONS**

- Current goals similar to historic goals
 - Minimize/eliminate child occupant death
 - Attenuate short- and long- term disability
 - Mitigate injuries requiring medical attention
- Future advances must be data driven
 - Surveillance data
 - Technical data ('black box')
 - 'Big' data (administrative data, social networking)

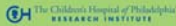
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SUMMARY

- Motor vehicle crashes leading cause of death and disability in children
- Proper restraint selection and installation can reduce injury and fatalities
- Increased knowledge of and adherence to newest AAP/NHTSA recommendations by both pediatricians and parents
- Knowledge gaps and non-adherence to best-practice both still exist
- Continued education and tested intervention to overcome barriers to knowledge and behavior

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QUESTIONS?

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- Child Passenger Safety
 - www.chop.edu/carseat
 - www.safercar.gov/parents
 - www.safekids.org/car-seat
- Teen driving
 - www.teendriversource.org
 - www.nhtsa.org/Teen-Drivers
 - www.teendriving.aaa.com

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