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Pre-Intervention Assessment: UC Davis Medical Center and California Health Care Safety Net Institute Child Passenger Safety Initiative

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Pre-Intervention Assessment

UC Davis Medical Center and California Health Care Safety Net Institute Child Passenger Safety Initiative

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Summary

Proper use of child passenger safety (CPS) systems is highly effective in reducing injury and fatality in traffic crashes. While use of CPS systems is increasing, use is not universal, and there is a high level of improper use.

The Child Passenger Safety Initiative is an innovative program that provides education and training in proper CPS system use to adults bringing children to public hospitals and clinics, and adults transporting foster children. The intervention includes education, training, and delivery of resources, such as free or low-cost safety seats, to encourage universal use of CPS systems, appropriate choices of CPS systems for a child's age and weight, and correct use of the CPS unit.

A pre-intervention baseline study of adults bringing children to public hospitals and clinics found that (i) only 81.0% of adults reported that they always use a child safety seat with their infants or toddlers (aged 0-4); (ii) only 67.2% of children were using the appropriate restraint system for their age and weight; (iii) there was a high level of misuse of child safety seats due to improper securing of the child and the safety seat, including the safety seat not being secured tightly enough to vehicle (68.6%), the harness clip not being at armpit level (62.3%), and the harness strap not fitting tightly enough on the child (60.1%); and (iv) while knowledge of a new "booster seat" law was high (84.4%), actual self-reported use of booster seats among children for whom it is appropriate was substantially lower (53.8%).

A <u>post-intervention</u> survey will be conducted to measure improvements in these values.

Based on the results of the Child Passenger Safety Initiative, models may be developed for adults with children attending public health hospitals and clinics as well as for the larger adult population that transports children in motor vehicles.

A. Traffic Crash Injury and Fatality among Children

Vehicle collisions are a major cause of death and injury among children aged 6 and under in California. In California in the year 2000, 75 children age six and under died from motor vehicle collisions, and an additional 7,473 children aged 0-6 suffered injuries throughout the state¹. Of the 75 children who died, over half (44) were not restrained. Of the 7,473 children who were injured, 16% (1,243) were not restrained. Since the restraint rate for children in California is about 85% on average², this indicates that a disproportionate number of deaths and injuries were among children who were not restrained.

When used correctly, child restraint systems are highly effective in preventing injury and fatality in event of a traffic crash. The National Highway Traffic Safety Administration (NHTSA), the federal agency with primary responsibility for traffic safety in the United States, estimates that properly installed child safety seats can reduce the risk of fatality by 69% for infants and 47% for toddlers³.

Despite the effectiveness of child restraint seats, many children in California are not restrained. The Statewide Seat Belt Usage Survey conducted in spring 2002, found that the overall occupant restraint use for infants and toddlers was 85.6%, down two percentage points from 86.6% in spring 2001⁴. The usage rate is substantially lower in some areas of the state, and is much lower for vehicles such as pickups. Even when a child restraint system is used, in many cases, the restraint system may be incorrectly installed or used inappropriately for the child's age and weight. A recent California law, SB 567 (the "booster seat" law), clarifies appropriate

¹ California Highway Patrol, 2001

² California Seat Belt Survey, Betancourt, 2002

³ NHTSA, 2000

⁴ California Seat Belt Survey, Betancourt, 2002

restraint system use by age and weight, and requires use of child safety restraints for children up to age 6 or up to 60 pounds (<u>Appendix A</u>).

B. The Child Passenger Safety Initiative

Clearly, increasing the correct use of child restraint systems is critical to reducing traffic injuries and fatalities among California children. The Child Passenger Safety Initiative is an innovative program designed to increase the use of child restraint systems in California.

The Initiative is made possible by a two-year, \$1.5 million grant from the California Office of Traffic Safety (OTS), which is charged with reducing fatalities, injuries and economic losses resulting from motor vehicle crashes through the California Highway Safety Plan (HSP). The OTS is responsible for funding and coordinating traffic safety efforts throughout the state⁵ and funded this effort through the Business, Transportation and Housing Agency.

The California Health Care Safety Net Institute (SNI), an affiliate of the California Association of Public Hospitals and Health Systems, in collaboration with University of California Davis Medical Center (UCDMC), heads the Initiative. The SNI is dedicated to advancing community health through the resources and expertise of California's open-door providers⁶.

The Initiative focuses on public hospitals in California. In 1999, California's public hospitals treated as many as 3,000 children who had been injured in motor vehicle collisions. The majority of patients at public hospitals (76%) are people of color, and 70% are low-income or uninsured⁷. In the face of recent research showing that underserved populations are at greater risk for motor vehicle injuries, public hospitals and health systems—which serve this patient

⁵ [http://www.ots.ca.gov]

⁶ [http://www.safetynetinstitute.org]

⁷ California Association of Public Hospitals and Health Systems

population—are striving to prevent motor vehicle deaths and injuries through the Child Passenger Safety Initiative.

Seven public hospitals and health systems throughout Northern, Central and Southern California are involved in the initiative, including Contra Costa Regional Medical Center, Monterey County Health Department/Natividad Medical Center, San Joaquin General Hospital, UC San Diego Medical Center, and the Los Angeles County Department of Health Services and three of its public hospitals: Olive View-UCLA Medical Center, LAC+USC Medical Center, and Martin Luther King, Jr./Drew Medical Center.

C. Program Description

Project sites participating in the Initiative receive funding and technical assistance to expand and improve child passenger safety education and to develop innovative models for reaching underserved populations. Activities include educating parents and caregivers about good child passenger safety practices, distributing free car seats, offering child safety seat inspections, and training physicians and nurses to teach patients about proper car seat use. There is also a special outreach component that focuses on education of foster parents and child welfare workers about child passenger safety.

The goals and objectives of the Initiative are to:

Increase child safety-seat use among families using services at participating
public health care systems;
Decrease the rate of child safety-seat "misuse" among these families; and
Increase awareness of the new child passenger safety law, SB 567, the "booster
seat" law that requires child safety restraints for children up to age 6 or 60
pounds.

To measure the impact of the project on parent knowledge and behavior, UCDMC and SNI have contracted with the University of California at Berkeley Traffic Safety Center (TSC) to evaluate the project⁸. Evaluation results will further understanding of effective interventions to maximize child passenger safety among underserved populations.

In developing the survey, the TSC worked with each site, as well as SNI and UCDMC, to develop a survey tool and a data collection plan. The full evaluation will consist of data collection both before (baseline) and after the intervention, with a before-after comparison to measure the impact. This report summarizes the pre-intervention (baseline) data collected between October, 2001, and June, 2002, at four of the participating sites: Contra Costa; Monterey; San Joaquin; and Los Angeles (Martin Luther King, Jr./Drew Medical Center). A future report will summarize any changes that may take place resulting from the CPS Initiative.

D. Methods for the Pre-Intervention (Baseline) Assessment

The pre-intervention assessment gathered information on adults (through interviews) and children (through observations) when the children were 0-8 years of age. The baseline data collection included two elements. The <u>first</u> element was an interview with the parent or guardian in Spanish or English to inquire about:

Knowledge of the child passenger safety seat ("booster seat") law that that went into
effect on January 1, 2002, and that extended the age and weight requirements for
children to be restrained from ages four to six years and from 40 to 60 pounds;
History of child safety seat use; and
Basic demographics (sex, age, race/ethnicity, and zip code), as well as vehicle and
seat helt characteristics

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^{8 [} http://www.tsc.berkeley.edu/]

The <u>second</u> element was a direct observation of child restraint use and misuse. The data collection instrument is included in <u>Appendix B</u>.

To recruit adults into the study, the Child Passenger Safety (CPS) Coordinator at each site determined the days when groups of parents or guardians of well babies or children were scheduled for visits. When the patient and parent/guardian left their appointments, the CPS Coordinator approached them, explained the study, and asked permission to conduct a brief interview and accompany them to their car to observe their child(ren) once they were in their car seat(s). The adults included parents coming to prenatal classes, at discharge from delivery, and attending well-baby or well-child visits, i.e., the adults were in different stages of CPS knowledge and use.

A potential bias exists with the data collected in this study. Parents knew they were participating in a safety survey and, therefore, could have given more favorable answers in the interview and could have been more careful in placing their children in safety seats during the observations than usual.

E. Results from Pre-Intervention (Baseline) Assessment

1. Number of Adults and Children

The main results are described below and in the tables that follow. Baseline information was collected at four public hospital/health clinic sites about:

knowledge of the booster seat law,
self-reported child safety seat usage, and
observed use and misuse of safety seats.

Results are reported separately for the four sites and combined for sites that had all data available.

A total of 515 adults participated in the survey. Three sites collected demographic information (Contra Costa, Monterey, and San Joaquin). Among these sites, over two thirds of the adults were Hispanic, two thirds were female, and almost 80% were parents of the children (Table 1).

Observations of children in vehicles were conducted only at hospital or clinic sites in Contra Costa, Monterey, and San Joaquin. At these sites, 463 children were observed (<u>Table 2</u>). Demographic information for the adults was collected; however, there were no apparent differences in child safety seat use or misuse by race/ethnicity, sex, or relationship to the child among the sites. Therefore, survey results are not broken down by demographic variables in this report.

2. Knowledge of the "Booster Seat Law"

Overall, 84.4% of the participants reported that they knew about the change in the child passenger safety law that went into effect on January 1, 2002, that included a provision about proper restraint for children ages four to six or between 40 and 60 pounds (<u>Table 3, A</u>). While this percentage is relatively high, and higher than might be expected for a new law, it means that almost 16% were <u>not</u> aware of the new law. This finding suggests that information about the new law should be a critical component of the CPS Initiative.

It is interesting to note that at the Contra Costa site, knowledge of the new law was only 50.8%. This low rate, compared to the other sites, is probably due to the fact that half of the surveys were conducted prior to January 1, 2002. The percentage with knowledge increased after January 1 and is likely due to post January 1, 2002 activities around the new law, including public educational efforts and enforcement. For all other sites, data collection was after January 1, 2002.

3. Use of Child Safety Seats

Overall, reported use of child safety seats for child passengers less than age four or less than 40 pounds was about 81%. This means that 19% of children in this category were <u>not</u> always restrained. This 19% represents a critical target group for the CPS initiative and other CPS efforts.

The percentage of drivers who report that they always use booster seats (for children aged four to six or weighing from 40 to 60 pounds) was significantly lower than the percentage of drivers who say they know about the booster seat law. Knowledge was, on the average, 84.4%, while self-reported use of booster seats was, on the average, 53.8%. This finding constitutes a difference between knowledge and self-reported behavior (Table 3, A.). It is possible that while participants knew about the new law, they where not aware of the details, misunderstood the law, and/or had not implemented the provisions concerning restraint use for children over four years and 40 pounds. Again, information and training about the new CPS law should be an important component of the CPS Initiative.

4. Self-reported Use for Younger versus Older Children

Overall, self-reported use of infant and forward-facing safety seats for children under four years and 40 pounds (81.3%) is greater than self-reported use of booster seats for children between ages four and six years and between 40 and 60 pounds (53.8%). This again illustrates that the stipulations of the new law have not been fully adopted by participants. Just passing the law is not sufficient; beyond participants knowing about the law, barriers to compliance should be identified and remedied.

 Observed Misuse—Percent Not Restrained and Percent Not Appropriately Restrained for Age and Weight

A total of 14.4% of children observed were not restrained, and this varied substantially across the three sites where observations were made. Even more striking, however, is that 32.8% of the children were not restrained appropriately with regard to their age and weight.

Encouraging use at all times, and education in use appropriate for a child's age and weight are clear objectives for CPS efforts.

6. Observed Misuse—Percent with Other Types of Misuse

Even when children are restrained appropriately for their age and weight, there are a number of errors that can be made with respect to actual installation and usage. For forward-facing safety seats, the most common forms of misuse were:

	the safety seat not being secured tightly enough to vehicle (68.6%);
	the harness clip not being at armpit level (62.3%); and
П	the harness strap not fitting tightly enough on the child (60.1%).

The observed misuse of booster seats (Table 3, D) is lower than misuse of infant or forward-facing car seats. This finding is probably due to booster seats being much simpler to use. Nevertheless, it is important to note that the vehicle belt was not properly routed through the seat for 8.6% of the children in booster seats, and the seat back was at an improper level for the child's head for 21.4%.

F. Implications of the Pre-Intervention (Baseline) Study for the CPS Initiative

The results of this pre-intervention (baseline) survey suggest important areas for CPS Initiative. These issues include:

<i>Increased use of all types of child safety seats.</i> Both self-reported and observed
usage was lower than desirable. Strategies are needed that emphasize the importance
of restraining children in vehicles.
Increased information about appropriate use considering age and weight of the
<i>child.</i> Recommendations for appropriate use of CPS systems by age and weight,
including those reflected in the new "booster seat" law, are complicated and may be
difficult for parents and other adults transporting children to understand. Strategies
should be developed to clearly communicate these recommendations to parents and
other adults who may have responsibility for transporting children.
Increased information and "hands-on" training about correct installation and use
of child safety seats. A high rate of errors was observed in the actual use of a child-
restraint system, even when the system was appropriate for age and weight of the
child. Detailed training should be made available to adults on the how to position the
seat, how to connect the harness strap, and how to secure the seat itself with the seat
belt.
Integration of CPS into health care systems. Child safety seats prevent injuries to
children. Integrating a CPS focus into public hospitals and clinics is key to protecting
the health of children in California.
Increased attention to environmental factors which impede correct use of child
safety seats. Cost of child safety seats can be an issue for low-income people.
Further, non-English speaking parents or guardians may face barriers in gaining
access to information about proper use. With regard to vehicle and safety seat design,
there is a great deal of complexity in fitting seats appropriately in vehicles.

Technology which makes it easier to fit child safety seats into cars is critical; however, it will take time to achieve broad-based access to these advances.

The National Highway Traffic Safety Administration (NHTSA) has observed that there is a very high level of child safety seat misuse in general. The findings here should generalize to all adults who bring children to public hospitals and clinics in California, and they suggest an urgent need for interventions to increase proper use of child restraint systems in vehicles. It is hoped that the CPS Initiative will be able to develop programs for parent education and training that can be used as models for increasing proper child restraint use.

Table 1 Number and Percent of Adult Drivers Bringing Children to Public Hospitals or Clinics by Race/Ethnicity, Sex, and Relationship to Child*

		Study	/ Site**		
	Contra Costa	Monterey	San Joaquin	Los Angeles***	Total
Number of Surveys Conducted	90	199	171	55	515
Race/ Ethnicity					
Asian	2.2	3.0	17.7	N/A	8.3
Black	17.8	0.6	15.3	N/A	9.4
Hispanic	61.1	88.6	47.1	N/A	67.8
White	12.2	5.4	17.1	N/A	11.1
Other	6.7	5.6	1.8	N/A	4.4
Sex					
Male	17.8	44.9	26.3	N/A	32.7
Female	82.2	55.1	73.7	N/A	67.3
Relationship to Child					
Parent	86.7	73	83.3	N/A	79.5
Relative	7.8	16.9	9.5	N/A	12.4
Guardian	5.5	2.3	1.8	N/A	2.7
Friend/ Other	0.0	7.9	5.4	N/A	5.4

^{*} Percents are weighted by number of participants at each site.

** Columns for each category sum to 100%, except for rounding error.

^{***} Only the interview was conducted and demographic information was not collected.

Table 2 Children Observed who were Brought by Adult Drivers to Public Hospitals or Clinics by Age Group

Age Category (Years)		Total			
	Contra Costa	Monterey	San Joaquin	Los Angeles	
Birth to 1 year	24	63	51	N/A	
					138
1 to 4 years	36	81	95	N/A	
					212
4 to 6 years	17	32	38	N/A	87
6 and older	2	15	4	N/A	21
Total	79	191	188	N/A	
					458*

^{*} Table includes those for whom age was available; n=463

Table 3 Survey and Observational Data on Key Outcomes for Adult Drivers and Their Children at Public Hospitals or Clinics by Site

	Contra Costa %	Mon- terey %	San Joaquin %	Los Angeles %	Total*
A. Survey data – booster seat law (n)	(65)	(198)	(171)	(55)	(489)
Drivers with knowledge of the booster seat law effective January 1, 2002	50.8	93.4	84.2	92.7	84.4
B. Survey data – car seat use (n)	(70)	(146)	(140)	(49)	(405)
Drivers who report they <u>always</u> use car seats for child passengers (0-4 and to 40 lbs.)	88.6	84.9	75.0	75.5	81.0
C. Survey data – booster seat use (n)	(26)	(27)	(100)	(37)	(190)
Drivers who report they always use booster seats for child passengers (between ages 4-6 and 40-60 pounds)	57.7	44.5	58.0	67.6	53.8
D. Observational data – all child passenger safety restraint types (n)	(67)	(187)	(142)	N/A	(396)
Children restrained in child safety seats or vehicle belts, when appropriate	83.6	78.6	95.8	N/A	85.6
Correct restraint type for age and weight	68.7	59.4	76.8	N/A	67.2
E. Observational data – Infant and forward- facing child safety seats (n)	(58)	(119)	(141)	N/A	(318)
Seat not in correct reclining or vertical position in vehicle	15.5	23.5	23.4	N/A	22.0
Harness clip not at armpit level	48.3	81.5	51.8	N/A	62.3
Harness strap not at appropriate level re: child's shoulders	13.8	20.2	35.5	N/A	25.8
Harness strap not tight enough on child	62.0	74.8	46.8	N/A	60.1
Safety seat not secured tightly enough to vehicle by seat belt	65.5	72.3	66.7	N/A	68.6
F. Observational data – Booster seats (n)	(9)	(28)	(33)	N/A	(70)
Vehicle belt not properly routed through seat	22.2	7.1	6.1	N/A	8.6
Seat back at improper level for child's head	0.0	50.0	3.0	N/A	21.4
G. Observational data – all child passenger safety error (n)	(80)	(194)	(189)	N/A	(463)
	76.3	90.2	74.6	N/A	81.4

^{*}Percents are weighted by number of participants at each site.

Appendix A. Recommendations for Appropriate Safety Restraint by Child Age and Weight in California as of January 1, 2002, based on SB 567

Age (Years)	Weight in Pounds					
	<20	20-40	40-60	60+		
Birth to 1 year	Infant (rear facing) safety seat	Infant (rear facing safety seat	NA	NA		
1-4 years	Infant (rear facing) safety seat	Front facing safety seat	Front facing safety seat	NA		
4-6 years	NA	Front facing safety seat	Booster Seat	NA		
6 and older	NA	NA	Seat Belt	Seat Belt		

Appendix B. Child Passenger Observational Survey Form

	Child	Passenger Usag	e Observational Surv	ey Form		
Date Tim	e Location		Surveryor			
NTERVIEW	200011011		30,100,701			
Demographics						
	Driver (also alverse)		00 / E	Dybyov Doron (object, op.o)		
7in Codo	Driver (check one) Parent	Drivor's Ago	M / F	Driver Race (check one) Asian		
Zip Code	□ Relative	Driver's Age	Gender (circle one)	□ Black		
	□ Foster/Guardian □ Friend			□ Hispanic □ Native American		
	□ Sitter			□ White		
	□ Other			☐ Other		
Transportation	Car / Booster Seat					
How do you			at requires children ages .	4-6 or 40-60 lbs to be seated in		
usually travel?	a car or booster se		up to age 4 and 40 lbs?			
Own Car	Water Constitution (Constitution)		Albertage and Arminia and Arminia the contraction of the second	age of 4 and 6 or 40-60 lbs?		
Other's Car	30		car seat(s) into car corre	170 mm		
Public Transit	and—the promotion of the Authorite Control of the C	201 1 C. S. C.	child(ren) into carseat co	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -		
□ Taxi						
□ Walk				Always Often Some Rarely Never		
□ Other	How often do you use	e car seat(s) for child	(ren) 0-4 and up to 40 lbs			
	How often do you use	e car seat(s) for child	(ren) 4-6 or 40-60 lbs?			
	How often do you ma	ove car seat(s) and b	ase for travel in different	cars?		
Comments				-		
BSERVATION -	Child Passenger 1					
Vehicle Information	on	Airbo	ags Check all that	apply		
		□ Fr	ont Driver 🗖 Front Pas	ssenger 🗆 Side 🗖 Other		
Make N	Nodel Year					
Child Bassanası	0.000,000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.00					
Child Passenger						
Child's Age	Ch	ild's Weight				
700 A70						
Seating	Check all that apply -	- Loc	ation	Belts		
■ Not restrained			In front seat	■ No seatbelt		
□ In rear facing co	ır seat		In back seat	\square Lap belt only		
□ In front facing c	ar seat		Front / Side Airbags	Lap/shoulder belt		
□ In booster seat						
Comments						
For Car Soat	Chook all that apply	For	Ponetor Coat			
For Car Seat	Check all that apply -		Booster Seat			
	clip not at armpit level		Vehicle belt not properly	routed		
□ Harness straps no	ot at or BELOW shoulders	<u></u>	Middle of ears not higher	than vehicle seat back		
□ Harness straps no	ot at or ABOVE shoulders					
\square Strapped in, mo	re than one adult finger f	its b/t chest and har	ness			
□ Vehicle belt not	secured car seat tightly					
□ Carseat not app	Car seat not appropriate for height and weight of child					
Other misuse/Comr	nents					

OBSERVATION -- Child Passenger 2

Child Passenger		
Child's Age Child's Weight	s	
Seating Check all that apply	Location	Belts
□ Not restrained □ In rear facing car seat □ In front facing car seat □ In booster seat □ Comments	□ In front seat □ In back seat □ Front / Side Airbags	□ No seatbelt □ Lap belt only □ Lap/shoulder belt
For Car Seat Check all that apply	For Booster Seat	
Harness retainer clip not at armpit level Harness straps not at or BELOW shoulders Harness straps not at or ABOVE shoulders Strapped in, more than one adult finger fits b/t chest and Vehicle belt not secured car seat tightly Car seat not appropriate for height and weight of child Other misuse/Comments	□ Vehicle belt not properly route □ Middle of ears not higher than thanks	

OBSERVATION -- Child Passenger 3

Child Passenger		
Child's Age Child's Weight		
Seating Check all that apply	Location	Belts
□ Not restrained □ In rear facing car seat □ In front facing car seat □ In booster seat □ Comments	□ In front seat □ In back seat □ Front / Side Airbags	□ No seatbelt□ Lap belt only□ Lap/shoulder belt
For Car Seat Check all that apply	For Booster Seat	
Harness retainer alip not at amplit level Harness straps not at or BELOW shoulders Harness straps not at or ABOVE shoulders Strapped in, more than one adult finger fits b/t chest and Vehicle belt not secured car seat tightly Car seat not appropriate for height and weight of child Other misuse/Comments	Vehicle belf not properly rouMiddle of ears not higher thoharness	