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Assessment of the NHTSA Standardized Child Passenger Safety (CPS) Training Course

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Efforts accelerated during the 1990s to increase the use of child safety seats (CSSs) by children riding in motor vehicles. While educational campaigns pressed all parents of young children to use CSSs, the National Child Safety Seat Distribution Program utilized funding provided through a 1995 agreement between the U.S. Department of Transportation and General Motors Corporation to make thousands of CSSs available to low income families and children with special needs. Yet research completed in 1996 for the National Highway Traffic Safety Administration (NHTSA) underscored that making CSSs available to everyone was insufficient to achieve the desired level of safety for children. The study quantified what child passenger safety professionals already knew, that the vast majority of CSSs (80 percent in the study) had one or more things wrong with how they were being used.[2] The influx of seats into the retail market was occurring in an environment of rampant misuses that potentially could cause or exacerbate injuries to children in a motor vehicle crash.

A Blue Ribbon Panel was convened in 1995 "to provide recommendations on ways to improve child safety seat compatibility, child passenger safety technology, and education."[3] The Panel, which was composed of representatives from automobile, child restraint and safety belt manufacturers; physicians; and child passenger safety advocates; recommended development of a standardized course designed to teach the fundamentals of CSS use to safety professionals and other interested parties. Individuals who successfully completed the course would then educate the public in using child restraint systems properly. An added goal was to produce consistency in CSS instruction across the different regions of the country.

A team of child safety seat experts formed as part of the Patterns for Life initiative[4] spent one and one-half years developing and pilot testing a curriculum. The result, launched in 1998, was the NHTSA Standardized Child Passenger Safety Training Course, which was complemented by a certification process for technicians and technician instructors. The course consisted of 32 hours of instruction, typically spread across four days, followed by a checkup event in a real world setting where the technician trainees applied the instruction they had received. Course materials were organized into a series of modules:

- Overview;
- Introduction;
- The Basics of Injury Prevention;
- Crash Dynamics;
- Federal Role and Safety Standards for Occupant Protection;

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[2] Lawrence E. Decina and Kathleen Y. Knoebel. Patterns of Misuse of Child Safety Seats. DOT HS 808 440. January 1996. Office of Program Development and Evaluation. National Highway Traffic Safety Administration.

[3] NHTSA Standardized Child Passenger Safety Technician Training and Certification Program and Other Related Programs. March 1998. National Highway Traffic Safety Administration.

[4] The Patterns for Life initiative was "designed as a national effort to ensure the infrastructure needed to implement and maintain up-to-date training and public education for child passenger safety, pedestrian and bicycle safety was in place across the country."

- Vehicle Occupant Protection Systems;
- Selecting and Securing Children in Vehicle Restraint Systems;
- Correct Installation of Child Restraint Systems;
- Misuse and Compatibility Issues;
- Safety in Other Vehicles;
- Other Occupant Protection Programs;
- Setting Up a CRS Checkup Event;
- Appendix.

National technician certification entailed the technician trainee successfully completing hands-on skills tests conducted throughout the course, as well as passing a written test during the last day of classroom activity. The course instructor then filled out paperwork, which was sent by the instructor or the technician trainee to the national certifying body for technician certification. During the first years of the standardized training program, AAA served as the certifying body. In 2004, the National SAFE KIDS Campaign took on the role as the certifying body, at the same time instituting many administrative changes.

Efforts to update and improve the curriculum have taken place at multiple points in time, with formal revisions to the curriculum enacted in 2001, and again in 2004.

NHTSA Evaluation Of Training Program

Use of the standardized course expanded rapidly across the nation following its launch. However, no formal evaluation had been conducted concerning its effectiveness. In late 1999, NHTSA contracted with Texas Transportation Institute (TTI) of the Texas A&M University System to evaluate the course.

The central objectives of the study were to determine whether the course information was adequately transferred from course instructors to technician trainees, and then adequately transferred from technician trainees to parents/caregivers. There also was an attempt to determine whether retention difficulties or other problems emerged with the passage of time, both for technicians and parents.

Assessing Veteran Technician/Instructor Knowledge And Perspectives

Initial information collection for the study entailed surveying and holding focus group discussions with experienced course instructors and technicians.

1) Veteran Technician Survey.

A sample of veteran technicians (technicians certified for at least one year) was surveyed to assess knowledge retention. The TTI researchers distributed questionnaires at the International CPS Technical Conference held June 10-14, 2000 in Arlington, Texas. Because the conference attendees may not have been representative of technicians across the country, the study team also mailed 500 questionnaires to a randomly selected sample of certified technicians generated from a list provided by the AAA national certifying body. The study team received 111 completed forms from conference attendees and 76 forms from the national mailing, for a total sample size of 187. All respondents were certified under the original curriculum.

The technicians rated how current they were on their child restraint system (CRS) knowledge using a 5-point scale, with 1 being not up to date and 5 being very current. Current was defined as being aware of most or all recent changes regarding CRS issues and technology. More than half (58 percent) assigned themselves a “4” and another 17 percent gave themselves a “5.” In general, those who considered themselves current on knowledge were more actively participating in checkup events and serving routinely as a CPS resource. The technicians also rated their confidence in putting into practice their knowledge of CRS technology. Again, more than half (54 percent) responded “4” while almost one-third (32 percent) wrote down “5.”

The questionnaire included a series of statements concerning correct CRS practices to which the technicians were to respond “True” or “False.” Those statements and the distribution of responses are presented in Table 1 on the next page. The percentages of technicians providing the correct response are **bolded**. As can be seen from the Table, the majority of technicians knew the correct answer to the listed questions, although some did not.

The technicians also answered several fill-in-the-blank questions. More than 90 percent correctly responded to three of the items: knowing that a rear facing CRS should be at a “45 degree” angle, that the harness clip should be at “armpit” level, and that the arm or handle of an infant only CRS should be in the “down” or “locked” position when installed in a vehicle. Fewer (69 percent) knew that Evenflo infant seats should not be used in front of a “fold-down armrest” according to manufacturer instructions.

Two short answer questions completed the knowledge assessment. One-quarter of the technicians were unable to explain why the middle slots of a forward facing convertible CRS should not be used. Most of the incorrect responses were fit-related, as opposed to correctly referring to reinforcement or strength. The second question asked the technicians to explain when a child should be using varying types of CSSs. The technicians were better at answering this question for the younger children: 91 percent correct for infant and rear facing convertible seats, 90 percent correct for forward facing convertible seats, 76 percent correct for high back booster with a harness, and 79 percent for belt positioning high back booster.

Table 1

Veteran Technician Responses To True/False Questions

Statement	% True	% False
It is acceptable to twist the safety belt "stock" (sic) up to 6 times in order to shorten it.	25.7	**74.3**
It is acceptable for the base of a forward facing CRS to be wider than the space between the belt and the buckle.	26.7	**73.3**
It is acceptable to use the middle slots of any forward facing convertible CRS.	13.3	**86.7**
It is acceptable to go against the manufacturer's limits for height if the child has not reached the manufacturer's limit for weight.	8.6	**91.4**
It is acceptable to turn a baby forward facing if they are under a year old but over 20 pounds.	5.9	**94.1**
It is acceptable to use a rolled towel or noodle for a forward facing CRS.	20.3	**79.7**
It is acceptable to use a rolled towel or noodle for a rear facing CRS.	**96.8**	3.2
It is acceptable for an infant whose head is one inch above the top of a rear facing only CRS to remain in the CRS until he reaches the manufacturer's weight limits.	16.6	**83.4**

The questionnaire asked the technicians if there were any specific items for which they would like refresher training. The most frequent request was for information on LATCH and tethering.

2) Veteran Instructor/Technician Focus Groups.

The study team conducted two focus groups at the International CPS Technical Conference. Course instructors and technicians participated in both groups. The focus groups took place in June 2000, shortly after the first revised curriculum was introduced in the field. Therefore, all of the participants were certified and took their courses under the original curriculum. For the most part, the instructors either were just beginning to teach the new curriculum or were still teaching the old curriculum.

The group participants were concerned about the skills levels of instructors and technicians plus weaknesses they perceived in quality control. They did not feel much in the way of qualifications was demanded of persons in order for them to become course instructors, and believed more requirements were needed. They also expressed confusion over requirements for "senior checkers" and were concerned that the level of experience of senior checkers could vary widely.

The groups recognized that skills in teaching parents and caregivers proper CSS installation differed across technicians. While the participants noted that only a small segment of the course was directed at building interaction skills, they concluded that more material on how to interact effectively with parents would not benefit the current course as it already contained an imposing level of information to master. And interaction skills were not necessarily teachable through classroom instruction. However, while the groups did not want to add to the course because of the amount of information already packed into it, they did ponder whether greater emphasis should be placed on the goal of teaching technicians to educate CSS users rather than provide technical services only. For example, one technician revealed that she did not remember anything in her training about education, rather, "the goal was to get the seat in correctly and get it checked off."

Many of the focus group participants acknowledged coming out of the course nervous and somewhat overwhelmed. They worried at the time about being able to properly carry out their CPS responsibilities without assistance. Such worries had since abated. Alternatively, the groups voiced concern about technicians who were overly confident and did not realize how much they did

not know. They did not perceive any effective monitoring of technicians. Liability concerns also engendered nervousness, particularly among the instructors.

The veteran technicians and instructors considered major strengths of the program to be the hands-on portions and "real life" opportunities for interaction with CSS users. Weaknesses associated with the program brought out by the focus groups included:

- No quality control for certified technicians;
- The imbalance between instructional time using a book versus time spent on hands-on instruction;
- Re-certification procedures (how do you know if technicians are getting help on the test from other technicians?);
- Lack of flow to the new curriculum (instructor's guide is difficult to follow);
- Instructors lacking the necessary balance of being good educators and being technically proficient;
- Allowing certified technicians to conduct in-house training outside of the course venue (i.e., technicians educating colleagues, rather than certifying through the course).

Suggestions for improving the course centered on more instructor training requirements and the introduction of quality control measures. The groups wanted more training and experience requirements for instructors. One suggestion was to require verification of teaching or presentation skills. Another was for a mentoring program as part of the training, and monitoring after instructor certification. The groups called for documented monitoring of instructors. One participant remarked "it should not be that they become instructors and run their own programs with no one to check on them. Everyone needs someone to follow up on him or her." This course of action was also recommended for technicians. That is, the focus group participants wanted to see more follow-up monitoring and experience requirements introduced into the certification process for technicians as well.

Assessing Information Transfer At Training Classes

The project team assessed information transfer at eight training classes spread across three States: Illinois, Florida, and Texas. The onsite evaluations occurred between October 2001 and August 2002, with the classes using the 2001 revised curriculum. Data collection methods included surveys, observation, and focus groups.

1) Daily Trainee Surveys.

At the conclusion of each of the first three days of class, the technician trainees filled out a questionnaire that asked their impressions of that day's instruction. Almost all the trainees (98 percent) agreed that the course material was presented in a clear manner and was easy to understand. But a number of them also referred to areas where they thought the course could be improved.

Perceived mastery of the course materials was weakest during Day 2, when some trainees became overly taxed by the abundance of information presented to them. Confidence rebounded on Day 3 as they gained a greater grasp of the course content. Almost one-quarter of the trainees (24 percent) did not believe enough time was allotted to each subject presented during Day 2, compared to 11 percent on Day 1 and 16 percent on Day 3. The trainees also were more likely to say they had questions or were unsure about topics at the end of Day 2 (37 percent) than after Day 1 (28 percent) or Day 3 (18 percent). Using a 5-point scale, with 1 being insecure and 5 being very confident, the trainees as a whole expressed less confidence on Day 2 (3.75) than Day 1 (3.81) and Day 3 (3.98) in their ability to share the basics of what they had learned that day with parents.

When asked at the end of Day 2 if there was anything they felt unsure about, the most frequently expressed uncertainties were "need more practice or unsure of proper way to use locking and/or belt shortening clips" and "need more practice or are unsure of correct way to install CRS and correct placement of CRS." On Day 1, some of the trainees wanted "more time to learn seat belt terminology and/or types." No single type of uncertainty stood out in Day 3 responses.

Many of the trainees would have liked more hands-on activity throughout the course. They tended to find the hands-on instruction one of the more interesting parts of the class, and felt they would have gained more with additional time spent on it and less time spent on lecture. There also were perceptions that the amount of information presented in the course was too much to fit into the allotted time. For some, there was a sense of being rushed through the training, and a desire to slow things down. The recommended solution was to extend the length of the class or cut material out of it. Other course recommendations included having more vehicles and car seats to use during testing.

2) Observation of Trainee Testing.

Course activities included testing the trainees on proper CSS selection and installation. The instructor presented the trainees with a standard set of scenarios and had them select an appropriate seat and install it correctly in a vehicle. Each trainee had to select the proper seat, thread and correctly adjust the internal harness, and secure the seat correctly to the vehicle in order to pass the test. The trainee was given three attempts to pass the test for each scenario.

In observing the trainee testing, the TTI study team discerned differences in the administration of the test across the course sites. Some programs used dolls for the testing and others did not. None of the dolls were anthropomorphic dummies. Some programs had more specific rules for test taking than others. For example, in some classes, students were not allowed to use their own vehicles to install the safety seats. There were cases where students were not allowed to use the same vehicle for multiple installations. Some students were allowed to work with others to "apply force" for a tight installation, while others were precluded from any interaction. The degree of interaction between instructor and student was also highly variable and individualized. Some instructors administering the test said very little, and were inclined to simply check off the form. Others gave praise when students succeeded. And others not only checked the form, but also drilled the students on reasons for their decisions and actions. In each course some instructors were "easier" on the testing than others. Since the same instructor was not required to re-check incorrect seat selections or installations, the more difficult testers were circumvented at times.

In almost 10 percent of the observed scenario tests, the TTI research team saw errors in seat selection or installation that were allowed to pass. There also were instances where the trainee made an error but was provided instruction or assistance and received a passing grade. In general, the trainees had greatest difficulty in securing the CRS to the vehicle, with 69 percent successfully passing this exercise on the first attempt compared to 88 percent who selected the correct seat and 79 percent who set the harness correctly on the first attempt.

3) Observation of Checkup Event.

The culminating experience of the 32-hour course was an opportunity for trainees to put newly acquired knowledge into practice at a checkup event conducted with parents or caregivers and their children. The study team observed trainees inspecting a total of 83 child seats at the 8 checkup events (although the team did not observe all cases from start to finish of the inspection process). The researchers utilized a checklist to score the trainees on both their technical and communication skills.

Information collection was the first step in the inspection process, as inspectors collected data on the child's age, weight, and height to determine if the parent or caregiver was using the appropriate restraint system for the child. When the study team observed this portion of the inspection, they found that nearly all of the trainees (92.5 percent) made the proper assessment as to the correct CRS. During the seat inspection, the study team witnessed a majority of the trainees properly addressing seat angle (92.5 percent of observed cases), position of the harness retainer clip (90 percent), threading of the harness retainer clip (87.5 percent), position of harness straps (83 percent), and snugness of harness fit (76 percent). The team observed 55 cases where tightness of installation was or should have been checked. In a dozen inspections, the tightness of the installation was not checked or else was allowed to remain less than the recommended standard. There were 15 cases in which a locking clip should have been used, with the trainees correctly identifying the need for the locking clip and its proper use in 9 of the 15 cases.

The study team generally found the trainees communicating well with the public. They displayed a polite and patient manner with children. With few exceptions, the trainees used simple language and explained acronyms when they used them. They attempted to answer parents' questions, spoke in a clear and understandable voice, and were willing to tell parents "I don't know" in response to questions for which they were unsure. They checked seats and provided instructions at a reasonable pace for parents to grasp the information.

While the trainees received high marks on general communications skills, they were weaker when it came to communicating the rationale for corrections they were making during the inspection process. The trainees' emphasis was often to "fix" the problems themselves, and in doing so they sometimes neglected explaining to parents why it was important that the errors be corrected. The study team noted further weaknesses in the educational process as trainees did not always ask parents if they understood what they had just been shown or if they had questions. Moreover, a substantial

proportion of the parents (40 percent of observed cases) did not personally install the CRS at the conclusion of the inspection process to demonstrate that they had learned what the trainees had been teaching them.

The trainees tended not to provide resource information or other help to parents for future problems or questions they may have, including questions about the next step in the CRS progression. The study team attributed this to the inspection focusing on the problems at hand and few parents asking about resources or for additional information. Some trainees provided business cards or instructed the parents to return to the agency conducting the checkup for help with future problems.

Individual instructor styles influenced the conduct of the CSS checks. As with the trainee testing, some instructors were more lax than others in their judgment of correct installations. Additionally, the study team found differences in degrees of oversight. At some events, especially small ones, the instructors clustered together and came when called upon to serve as a senior checker to check off on the inspection. Most did not observe technicians throughout their first real-world practice session, treating them instead as if they were fully certified.

At each of the study sites, the instructors held a wrap up or debriefing session immediately following the checkup event to review the experience and offer congratulations. Course instructors almost always emphasized that they would be available for additional support. However, the need for more practice or reliance on teamwork before checking seats solo was not emphasized.

4) Technician Trainee Focus Groups.

The study team conducted 4 focus groups with technician trainees to complement the information provided by the daily trainee surveys. Three groups took place after the written test but prior to the checkup event, and 1 occurred immediately after the checkup event that concluded the course. The participants felt prepared and confident about their newly gained knowledge. They conceded being anxious in anticipation of the checkup event, but also eager to move towards direct interaction with parents. The trainees were highly complimentary towards the instructors, considering them well-informed, knowledgeable and excellent teachers who were strongly committed to child passenger safety. They also praised aspects of the course. In two groups an appreciation for the frequent reviews and built-in redundancy throughout the course was mentioned. Another positive comment repeated across groups was the advantage of having a large variety of child safety seats for demonstration in the classroom. The value of having a "team" of instructors also came up multiple times in the groups.

The trainees remarked on the large amount of information presented in the course, and felt that compressing it into a 32-hour time block injected a degree of stress. The most common complaint to surface in the focus groups was the amount of time required for the hands-on evaluations. It was not necessarily that the testing itself was too time consuming, but that there was a waiting period to be "checked off" by an instructor. This led to more frustration than any other part of the course.

The trainees offered an assortment of suggestions to improve the course, including:

- More cars for the hands-on testing;
- More instructors for the hands-on testing;
- More hands-on practice;
- Demonstrate and name all the parts of the CSS first, before students disassemble the seats;
- Make the course a 40-hour course;
- More breaks;
- More room in the classroom;
- More video clips;
- Reducing how long it takes to get from the classroom to the practice outside;
- Reducing the amount of down time.

5) Post Course Trainee Surveys.

At each study site, the trainees were given a questionnaire on the last day of class to take home with them. The study team instructed them to complete the survey after they had participated in the checkup event, and after they had allowed themselves time to reflect on their training experience. Fifty-one out of 135 trainees returned the forms. Their responses suggested that the experience of going through the checkup event increased the trainees' confidence in their ability to demonstrate correct CSS use. The trainees also indicated that they felt very confident in their ability to answer questions from parents and very confident that they now could serve as an educational resource for CRS users. Fewer than half identified subject areas in which they felt uncertain, with "installing seats correctly" and "how to handle recalls" being the most common among the limited number of responses. The trainees rated the course very effective

in teaching correct CSS installation, teaching how to conduct checkup events, teaching how to interact with parents, teaching how to demonstrate CSS installation, and explaining the rationale for the methods being taught. When asked if anything was missing from the course that should have been included, only a few topics were mentioned: hands-on experience with school buses, how to respect parents, information on how to educate the community other than through checkup events, and some type of follow-up. Requests for more concentration in the areas of role-playing, interacting with parents, and more hands-on practice also were made.

6) Parent/Caregiver Feedback.

At each checkup event, the study team handed a questionnaire to the parents and caregivers and asked them to fill out the form at home and then return it using a stamped envelope that the team provided. A total of 33 out of 99 questionnaires were returned.

When asked why they attended the checkup event, the parents/caregivers typically responded that they simply wanted to know if their child seats were installed correctly, or that they wanted to find out how to make sure the seat was not too loose and learn how to keep it from getting loose. All those who expressed these reasons indicated that their concerns were addressed. The parents/caregivers, on average, waited 4 minutes to begin the inspection and then spent 33 minutes in the inspection process. Most had 3 technicians working with them, which they considered a satisfactory number (except for several who deemed this too many). The parents and caregivers indicated that they were very satisfied with the knowledge, skills, and performance of the technicians, despite a few instances described by the parents and caregivers of difficulties encountered by the technicians. They typically reported that they went through all or almost all of the components of a complete inspection. The least frequent components matched those identified by the study team during observation of the checkup events: providing information on the next step in the CRS progression, providing information on resources to handle future questions, and having the parent install his or her own seat. As to overall success of the checkup, the parents/caregivers expressed a high level of confidence that they now knew how to install their CSS correctly. Their closing comments revolved around praise for the service and suggestions to have it publicized more.

The parent/caregiver questionnaire included an item asking to conduct a follow up telephone interview at a later date. Only 10 persons were successfully contacted and administered the interview. The interviews took place between 3 and 12 months after the checkup events. The study team determined that all the interviewees were placing their child safety seats and children in the correct direction for their age and weight at the time of the interviews. Those who had removed and re-installed the seat that had been inspected reported no difficulties in the re-installation. In general, the parents/caregivers tended to be comfortable with the current tightness of their CSS installation, did not have lingering questions following the checkup event, did not feel they had forgotten information given to them at the inspection, and felt they could re-install the seat the same way it was demonstrated to them.

The study team also attempted to obtain information from parents/caregivers through focus groups scheduled to occur within a day or two of the checkup events. This changed to individual interviews as few persons (5) showed up for the sessions. Within the interviews, the participants stated that they had learned a number of things at the checkup event and conveyed respect for the knowledge exhibited by the technicians. However, their comments also included examples of technicians not adequately explaining some aspect of the inspection.

Changes In The Standardized Course

The study findings described above included suggestions made by course participants on ways the curriculum and the administration of the course could be improved. Since the assessment was completed, some of the suggestions for improvement that were raised have been addressed:

1) Improved Requirements for Instructor Candidates.

The criteria for approval as an Instructor Candidate were revised to include a means of verifying both the technical skills of candidates as well as their instructor skills. The new criteria include Letters of Support from people in a position to address the skill level of the candidate.

2) Improved Quality Control for New Technicians.

The National Child Passenger Safety Board, which has the responsibility to oversee the quality and integrity of the training program, has discussed ways to provide

support to newly certified technicians. While at this time no requirements have been established, the Board has strongly endorsed the concept of "mentoring" newly certified technicians. In addition, many State organizations have established their own methods of quality control.

3) Additional Time for "Hands-on" Exercises.

The most recent updates to the standardized curriculum have included modules referred to as "self study" modules. Students in the course are expected to review these modules on their own so as to enable the instructor to spend less time on these particular topics, thus allowing more time for the "hands-on" exercises without extending the course timeframe.

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