

**Child Passenger Safety Initiative for Primary Care Providers**

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**Abstract**

Motor vehicle collisions are a leading cause of childhood injury and death. Primary care providers (PCP) have the potential to equip parents and caregivers with knowledge and education regarding the importance of child passenger safety (CPS). Evidence-based literature supports that increasing PCP knowledge of CPS and child safety seats (CSS) will increase the knowledge of caregivers. This shared knowledge, in turn, will promote childhood injury prevention. This quality improvement (QI) project implemented a CPS-focused educational initiative for PCPs. The initiative focused on PCPs increasing shared knowledge with caregivers through anticipatory guidance. The target population was individuals attending well-child visits from birth to eight years old. This intervention produced an increase in CPS-focused anticipatory guidance documented during well-child visits. Increased knowledge of CPS in the primary care setting has the potential to prevent childhood injury and death.

*Keywords:* child passenger safety, primary care, childhood injury prevention, motor vehicle collision, pediatric, anticipatory guidance

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## Section I. Introduction

### Background

In the United States, accidental injuries, including motor vehicle collisions (MVC), were a leading cause of childhood death in 2018 (The Centers for Disease Control and Prevention [CDC], 2020b). In addition, the Centers for Disease Control and Prevention (CDC) reports that of children 12 years old and younger who died in an MVC, 33% were not adequately restrained (CDC, 2020b). Motor vehicle safety restraints include car seats, booster seats, and seat belts. The incorrect size and age-appropriate safety restraints, improper installation of the car seat, incorrect use of the car seat harness, as well as lack of safety restraint usage are all contributing factors to death and injury related to MVC among children.

It is common for healthcare members in prenatal and pediatric settings to recommend caregivers go to Fire-Rescue departments for instruction on proper car seat installation (██████████, personal communication, May 19, 2021). Fire-Rescue departments local to the area of project implementation have previously required staff members to hold the child passenger safety technician (CPST) certification. In recent years, funding for CPST courses has decreased, and CPST certification is no longer required for employment leading to decreased knowledge of child passenger safety (CPS) requirements amongst first responders (██████████, personal communication, May 24, 2021). While there is no reported gold standard for which profession is responsible for the disbursement of CPS education, individuals trust healthcare professionals when seeking guidance and information regarding the safety and upbringing of children. This guidance includes information related to CPS. The role of the primary care provider (PCP) in the pediatric population includes providing anticipatory guidance to caregivers regarding safety concerns for children. These safety concerns include water safety, reduction of falls, and CPS.

The American Academy of Pediatrics (AAP) recognizes the role the PCP plays in preventing childhood injury. The AAP provides an optional CPS training module for healthcare professionals to educate and promote collaboration with CPSTs to improve the service to the community (American Academy of Pediatrics [AAP], 2011). However, this training module has not been updated since its publication in 2011.

The initiative's goal was to increase anticipatory guidance provided by the PCP on CPS during well-child visits. The goal was achieved by educating PCPs on evidence-based practice for child safety seat (CSS) selection, correct harness use, and available resources within the community. This initiative began with an educational program within a PCP office to promote CPS education given to caregivers. This program allowed PCPs to identify at-risk seats brought into the clinic, such as damaged infant carriers, educate on the correct harnessing of children, and locations of car seat checks by certified CPSTs.

A rural health organization that is a federally qualified health center hosted the implementation of this quality improvement (QI) initiative. The organization serves a diverse patient population, including underserved populations, those of low socioeconomic status, those with limited access to healthcare, and immigrant populations. The organization is widely involved in the community through community events and outreach programs. The organization strives to provide “quality and accessible healthcare to members of the community in a cost-efficient manner” ( [REDACTED], n.d.). In addition, the organization is committed to improving community health, including injury prevention programs. The organizations consisted of various healthcare services, including family medicine, women’s/prenatal care, behavioral health, and dental care. Pediatric health services were integrated within the family medicine division.

**Organizational Needs Statement**

The healthcare providers strive to improve community health through primary care and preventative medicine. Through preventive medicine for the pediatric population, the providers examine the patients through multiple well-child visits from birth through teenage years. At these visits, the child is screened for various health conditions, and the caregivers are provided with education and anticipatory guidance for situations relevant to the child's development. One of the essential educational points providers discuss with caregivers and patients is CPS. CPS is relevant from birth until a minimum of age eight. North Carolina law requires a child safety seat until age eight or eighty pounds.

While this is not an outcome measure set forth by the Centers for Medicare & Medicaid Services (CMS), CPS is an essential issue that providers should prioritize in primary care. However, discussion of motor vehicle safety is included in the annual wellness visit for those with Medicare, yet not required for well-child visits. This intervention prioritized the prevention of childhood injury related to improper use of CSS. Providers must be familiar with a variety of CSS, the appropriate seats to use based on age and development, the basic components of the seats, and the correct harnessing of a child. Members of the clinic staff recognized a lack of knowledge amongst the population they serve regarding the importance of CPS. The providers also recognized the population does not know where to go for information and frequently trusts the expertise of their healthcare team versus other individuals.

**Problem Statement**

While MVCs continue as a leading cause of death among children, with the most recent statistics dating from 2018, few studies are available regarding interventions to decrease the incidence of childhood fatality (CDC, 2020b). Although the CDC reports that many children

died in an MVC with improper restraints, there was a decrease in CPS interventions (CDC, 2020b). The CDC reports that of children 12 years old and younger who died in a MVC, 33% were not properly restrained (CDC, 2020b). Providing education on preventing childhood injury is essential for the healthcare provider. Healthcare providers need the training to educate parents on appropriate use and available resources regarding CPS. Healthcare providers should be able to disburse this information to caregivers with ease.

### **Purpose Statement**

This QI project aimed to provide an educational intervention to healthcare providers on CPS and where to direct caregivers to go for further information and resources. The project aimed to identify improper car seat usage, improve the information given to caregivers, and promote awareness of the appropriate resources for CPS during well-child visits. In addition, this project aimed to improve healthcare professionals' knowledge of CPS, injury prevention, and available resources for caregivers. The implementation of this project focused on the need for accountability of healthcare professionals to promote childhood injury prevention through CPS. It is the responsibility of healthcare professionals to utilize an interdisciplinary approach to promote health, wellness, and safety to patients.

## **Section II. Evidence**

### **Literature Review**

An abundant amount of research showed that interventions are needed to improve CPS and outcomes related to MVC. To discover how interventions improve these outcomes, the review of current literature included interventions, current guidelines, and requirements for CSS checks. In addition, to enhance child passenger outcomes in an MVC, recognizing best-practice



in child restraint systems was the priority. Therefore, many of the literature review articles focused on the application and distribution of education regarding CPS best practices.

When conducting the literature search, databases utilized include PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and ProQuest. The search terms were selected in the literature search process to retrieve significant literature regarding CPS, current guidelines, and interventions. These terms included *child passenger*, *car safety device*, *child restraint*, and *primary care*. Other keywords included *rear-facing*, *forward-facing*, *installation*, *education*, *training*, *implementation*, *intervention*, *inspection station*, and *demographics*. One search included peer-reviewed journal articles only. Search limitations initially included the English language, full text, and publication between 2016 to 2021. All levels of evidence were considered based on overwhelming amounts of articles unrelated to the primary topic of appropriate use and education on child restraint use. Searches that resulted in more than one hundred publications were narrowed by including other identified keywords—narrowing the search through this process allowed for a thorough review of relevant titles.

A total of 46 relevant publications resulted from the literature search. Determining relevancy to the Doctor of Nursing Practice (DNP) project was evaluated through a review of titles and abstracts. Exclusion criteria included data collected outside of the United States or the United Kingdom, involvement of teen drivers, vehicle-specific data, child restraint systems no longer manufactured, newborn-specific data, and extrinsic factors outside of misuse of child restraint systems, among many others. The literature review did not include articles deemed irrelevant to the DNP project. Eleven articles remained for the literature review. A thorough review of the remaining publications determined relevancy to the DNP project.

***Current State of Knowledge***

The AAP and the National Highway Traffic Safety Administration (NHTSA) recommend that children, including infants, toddlers, and young children, remain rear-facing in a CSS as long as possible (Durbin & Hoffman, 2018). The child should stay in a rear-facing position in their seat until they outgrow the height or weight for the seat in that position. Many CSSs in production are combination seats or convertible seats. Combination seats are CSS that have rear- and forward-facing abilities. Convertible seats are CSSs that start as a rear-facing seat for infants and toddlers, expand to a forward-facing seat, and then to a booster seat. These seats promote the longevity of the child remaining rear-facing. Once the child exceeds the regulations for rear-facing, they will utilize a forward-facing seat with a 5-point harness until they outgrow this seat (Durbin & Hoffman, 2018). Once the child has outgrown the forward-facing harness seat, the child will transition to a booster seat that requires a lap and shoulder belt (Durbin & Hoffman, 2018). The child will transition out of the booster seat when sitting with the lap and shoulder belt fitting appropriately. Most children transition out of a booster seat, typically between eight and twelve years old, with the average height for a child transitioning out of a booster seat is four feet, nine inches (Durbin & Hoffman, 2018). Despite the age and size of the child, they must be mature enough to sit in the seat with the seatbelt in the correct position. Durbin & Hoffman (2018) also recommend that all children less than 13 years old sit in the vehicle's rear seat using a lap and shoulder seat belt. The AAP based these recommendations on the updated assessment completed by McMurry et al. (2018).

***Current Approaches to Solving Population Problem(s)***

Various interventions utilized to promote CPS include social media outreach, virtual education, anticipatory guidance provided through PCPs, discharge education nurses provide in

the hospital setting, community checkup events, and inspection stations. Safe Kids Worldwide (SKW) is an international organization devoted to helping families and communities prevent childhood injuries, including injuries related to CPS (Safe Kids Worldwide, n.d.b). SKW is the certifying body for the CPST certification and is responsible for the accreditation of inspection stations (Safe Kids Worldwide, n.d.a). Inspection stations employ certified CPSTs to provide parents/caregivers with the education and resources to install a CSS and use it appropriately. Inspection stations are open in different locations throughout North Carolina and are operated based on coalitions and community programs. Although the inspection stations are available to the population by appointment, there are also community outreach events. However, due to the COVID-19 pandemic, community outreach events are not occurring as frequently.

### ***Evidence to Support the Intervention***

Interventions to improve CPS include educating healthcare workers such as providers, nurses, and first responders to provide education and anticipatory guidance to parents/caregivers on the use and position of CSS and harnessing the child. Smola et al. (2020) reported using an educational module in a pediatric emergency department to increase the nurses' knowledge of CPS; this intervention increased the intent to counsel parents/caregivers. Burstein et al. (2017) involved using a CPST to provide consultations in the pediatric primary care setting; this study showed a decrease in misuse of CSSs. Huseth-Zosel and Orr (2016) examined the frequency of CPS counseling delivered by health care providers (HCP) dependent on specialty. Huseth-Zosel and Orr reviewed the frequency of CPS counseling from pediatric HCPs and non-pediatric HCPs. Their research revealed that health disparities regarding CPS could occur in patients with limited to no access to a pediatric HCP.

The healthcare agency recognized the need for increased injury prevention measures within the community. They also recognized the room for growth amongst providers regarding anticipatory guidance and injury prevention. The AAP also acknowledged the need for enhanced education for HCPs on CPS (AAP, 2011). As a result, the AAP published an educational module on CPS to promote collaboration between HCPs and CPSTs. By utilizing an educational program for HCPs, the patient population had increased exposure to CPS information. Through this, the long-term goal was to decrease the rate of childhood injury due to MVC.

### **Evidence-Based Practice Framework**

The team utilized the Reach Effectiveness-Adoption Implementation Maintenance (RE-AIM) implementation model through the progression of this QI project. The team selected the RE-AIM model to assist the QI project in translating research into practice. While abundant research showed the best practice of CPS, the information needed to be shared and seen in practice. Goals for the QI project using the RE-AIM model included reaching the target population, evaluating intervention effectiveness, adoption by the organization, consistent implementation, allowing for adaptations as needed, and maintaining the effects of the intervention over time (Holtrop et al., 2018).

The utilization of the Plan-Do-Study-Act (PDSA) model in the QI project guides the initial ideas and evolution of goals (Institute for Healthcare Improvement [IHI], n.d.). The Aim statement included increasing disbursement of CPS information by PCPs to caregivers during the newborn to eight-year-old well-child visits by May 2022. Assessment of the implementation will be completed through chart audits and provider interviews conducted by the project lead. The PDSA model was a cyclical approach to the project to identify adjustments that needed to be made to the implementation process. The project allowed for frequent PDSA cycles as data was

collected throughout the implementation. The use of the cycle resulted in accomplishing the goals identified for the project. Therefore, using the PDSA model as a cycle influenced the QI project to achieve the best outcome.

### **Ethical Consideration & Protection of Human Subjects**

The QI project focused on equal opportunity for community members to have CPS. PCPs encountered various races, ages, genders, and socioeconomic classes. As a result, the information on CPS given by PCP reached a diverse population of caregivers with no risk for potential harm to the providers or community members. Members of the community were included as participants as they received the information. In addition, the Bright Futures handout, required by agency policy for well-child visits, was given to the caregivers. The Bright-Futures handout contains supplementary CPS information; this prevented harm from occurring to the caregivers or patients as CPS information is covered within the handout.

Collaborative Institutional Training Initiative (CITI) modules reviewed ethical principles and defined human and research subjects (Collaborative Institutional Training Initiative [CITI], n.d.) The DNP student completed these modules for education on ethical considerations that may have arisen during the QI project. This project, identified as a QI initiative, was not defined as research. The CITI modules also reviewed vulnerable populations, including employees (CITI, n.d.). The providers employed by the agency participated in the QI project voluntarily. The collection of data did not focus on provider performance but solely on sharing CPS knowledge with a specific patient population. To decrease the risk to the providers, privacy was provided by not including provider names during the data collection process.

In preparation for this project, the student obtained a letter of organizational support from the project site. The project site did not have an institutional review board (IRB). However, the

QI project was presented to the chief operating officer and the director of clinical services for approval. Documents, including a project approval tool and a self-certification tool, were submitted to East Carolina University's IRB and determined not to require IRB approval.

### **Section III. Project Design**

#### **Project Site and Population**

The CPS QI project occurred at a community health center that provided primary care to underserved populations in rural eastern North Carolina. The project population consisted of six PCPs; two were physicians, and four were family nurse practitioners. The two physicians specialized in family medicine. Only one family nurse practitioner had experience in a solely pediatric primary care setting. Project facilitators included the chief operating officer, the director of clinical services, and the providers. Due to provider availability and preassigned meeting agendas, scheduling was the primary barrier to the initiation project. Scheduling was also influenced due to the COVID-19 pandemic. In addition, a suspected barrier to the project included compliance with charting requirements for correct data collection and interpretation.

#### ***Description of the Setting***

The project was implemented in a rural primary care office. The office is a federally qualified health center and receives funding opportunities specifically available as grants for federally qualified health centers. The office consisted of different health care divisions, including women's/prenatal care, dental care, behavioral health, and family medicine. The project was implemented within the family medicine department. The family medicine department served patient populations from newborns to older adults. Pediatric services ranged from newborn visits, weight checks, well-child visits, sports physicals, to acute pediatric visits.

***Description of the Population***

The family medicine department employed six providers, four full-time and two part-time providers. One physician and three nurse practitioners were full-time, while one physician and one nurse practitioner were part-time. The part-time physician had been in practice for ten years, and the part-time nurse practitioner had been in practice for nine years. One nurse practitioner had been in practice for three years, one nurse practitioner had been in practice for two years, and the other nurse practitioner had been in practice less than two years. The full-time physician had been in practice for two years. One physician and one nurse practitioner were males, while one physician and three nurse practitioners were females.

**Project Team**

The project team included those vital to the success of the QI project implementation. The project team consisted of the DNP student, project site champion, and faculty mentor. This team involved an interdisciplinary approach to the project. The DNP student was a Bachelor's prepared registered nurse who held the CPST certification. The project site champion was a Master's prepared family nurse practitioner who works within the agency. The project site champion had prior experience in a pediatric primary care setting and was one of the primary providers that treated the pediatric population. The site champion allowed for smooth collaboration between the project lead and the organization's administrative team throughout the planning and implementation process. This collaboration permitted strategic planning and implementation to provide the agency with the most beneficial outcome. The faculty mentor advised the student during the planning and implementation of the project.

**Project Goals and Outcome Measures**

The project's primary goal was to increase the occurrence of discussing CPS between primary care providers and caregivers during well-child visits from newborn to age eight. Key topics addressed during visits included an age-appropriate choice of CSS and proper restraint use. Measurable outcomes included the rate of patients who received anticipatory guidance regarding CPS and patients referred to the local Safe Kids coalition for further education and resources during well-child visits. The quantifiable outcomes were obtained through biweekly chart audits.

***Description of the Methods and Measurement***

Through the implementation phase, the RE-AIM framework and PDSA cycles were used to evaluate and promote the success of the intervention. At the beginning of the implementation process, the providers were educated on critical topics to discuss during well-child visits. The key elements used to measure progress for the project included disseminating CPS information to caregivers, including age-appropriate CSS choice and correct harnessing; other shared information includes resources available to caregivers through the local Safe Kids coalition. To measure the occurrence of discussing CPS, the providers documented in the Assessment and Plan of the electronic health record (EHR); there was an “Anticipatory Guidance” (AG) section located within the assessment and plan where a “Car Seat Safety” tab was located. The providers would checkmark “Car Seat Safety” to acknowledge the discussion during the visit.

Documentation regarding CPS identified in this area of the EHR was referred to as “AG Flowsheet.” A comment section was located within the AG Flowsheet for the provider to use when patients and caregivers require referral to an inspection station or further education. It allowed the providers to use free-text documentation, as the visit indicates. These features were



only available for well-child visits in the EHR. The scheduling department automatically populated well-child visits in the EHR when appointments were scheduled, making the features available to providers without additional steps.

The outcome measures for this project included the percentage of well-child visits that documented education on CPS and the rate of not discussing CPS. To determine the percentage of well-child visits that discussed CPS, the number of well-child visits with documented CPS education was divided by the total number of well-child visits and multiplied by 100. To determine the percentage of well-child visits that did not discuss CPS, the number of well-child visits without documented CPS education was divided by the total number of well-child visits and multiplied by 100.

#### ***Discussion of the Data Collection Process***

The data collection process included chart audits, in-depth chart reviews to identify potential barriers, and provider interviews. Chart audits and data reviews began two weeks before implementation and were followed biweekly from the initiation of implementation. The chart audits on well-child visits to obtain the rates of usage of CPS documentation were obtained through the informational technology department. The report provided by the informational technology department included each well-child visit completed during the implementation time frame, CPS documentation within the AG Flowsheet, and CPS documentation within the well-child visit note. This information is provided biweekly to the project lead. For encounters that did not have CPS discussed, a chart review was completed to determine if there were acute problems identified that became a priority for the provider. Provider interviews were conducted throughout the implementation phase as indicated by chart audits as determined necessary between the project lead and the project site champion. The interviews allowed the project lead

to identify further obstacles to the implementation process and facilitate needs when updating PDSA cycles. The provider interviews were informal; see Appendix A for questions utilized during the interviews.

## **Implementation Plan**

### ***PDSA Cycles***

The implementation plan was formulated using a series of PDSA cycles. The first PDSA cycle began during the pre-implementation phase in October 2021. The initial project involved an educational intervention for primary care providers on key topics to discuss with caregivers in well-child visits from newborn to eight years old. A series of chart audits measured the intervention to determine compliance with the intervention. The first PDSA cycle included the formulation of a PowerPoint utilized during the education of PCPs, collecting resources to share with the PCPs, and creating a handout to provide to caregivers during the visit. Subsequent PDSA cycles followed to review data trends.

### ***Implementation Process***

The education intervention began with a PowerPoint presentation by the project lead during a family medicine provider meeting in February 2022. The education included information on the age-appropriate selection of CSS, such as rear-facing, forward-facing, high-back booster, booster, or lap-shoulder belt. The education also included correct use of a five-point harness and when to use a lap-shoulder belt. After delivering the PowerPoint, the project lead distributed resources on proper usage, selecting CSS, and harnessing a child for reference. The providers were also given a brochure on CPS to distribute to caregivers at well-child visits from newborn to eight years old with Bright-Futures handouts.

During the implementation phase, the providers continued to see their patients as routinely scheduled and implemented CPS education into the well-child visits from newborn to eight years old. Following the initial educational presentation, chart audits and reviews were completed biweekly in collaboration with the informational technology department. The project lead utilized an excel spreadsheet to collect and analyze data. Throughout the implementation process, interviews with the providers were used by the project lead to identify further barriers and areas for growth and modification. The continued use of PDSA cycles was utilized to adjust the implementation process to ensure the project's goals were met.

### **Timeline**

The initial planning phase was started in June 2021 and was modified for the implementation site and intervention in October 2021. The planning phase was continued as modifications were identified. The implementation phase of the project took place over three months. The implementation began on February 16, 2022, including an educational presentation and distribution of resources and caregiver materials. Chart reviews were conducted two weeks before the intervention implementation. Chart audits and reviews were conducted biweekly following the educational session. Following each biweekly chart audit, a new PDSA cycle began. Monthly meetings in February, March, and April were conducted between the project lead and the project champion to review current data. The ending of the final PDSA cycle occurred on April 27, 2022. The final data analysis occurred in May of 2022. The project findings were disseminated to the university and project site in July of 2022. A visual illustration of the implementation timeline is located in Appendix B.

## **Section IV. Results and Findings**

The project's goal was to improve the rate of education provided to patients and caregivers regarding CPS during well-child visits between birth to eight years old. Data collection began before the initial educational intervention and continued over 12 weeks. Documentation completion rates were assessed through a series of biweekly chart audits. The audits reviewed documentation of CPS through the Anticipatory Guidance (AG) Flowsheet and within the well-child visit note.

### **Results**

The rate of documentation within the AG Flowsheet regarding CPS information given to patients and caregivers was the process measure for this QI project. The outcomes measured for this project included the percentage of well-child visits in which providers documented education on CPS and the rate at which CPS education was not documented. Two weeks before implementation, 33 patients were seen for well-child visits from birth to eight years old. Of these 33 patients, three (9%) had documentation regarding CPS discussion within the AG Flowsheet. Nine (27%) of the 33 patients had documentation regarding CPS discussion in the well-child visit note. A total of 12 patients (36%) had documentation of CPS education within the well-child visit note and AG Flowsheet of the 33 patients. This left 21 out of 33 patients (67%) without documented mention of CPS during a well-child visit.

A total of 99 patients presented for well-child visits during the implementation phase. Of the 99 patients, 27 (27%) had CPS education documentation within the AG Flowsheet. Of the 99 patients, 16 (16%) had CPS education documentation within the well-child visit note. A total of 43 (43%) of the 99 patients had documentation of CPS education within the EHR on the date of the well-child visit. This left 56 out of 99 patients (56%) without documented mention of CPS during a well-child visit. The biweekly data is located in Appendix C.

On two occasions during the implementation phase, provider interviews were conducted to guide PDSA cycles and review processes. The HCP-identified barriers to implementation included time constraints during well-child visits and a lack of time available for documentation. In addition, the HCPs identified instances in which CPS was discussed, but the documentation was not completed. Facilitators for documentation were identified to include incorporating CPS questions on provider individualized encounter forms, CPS posters placed within the exam room, and readily available CPS brochures attached to a patient's discharge paperwork.

As implementation proceeded, the CPS documentation rate decreased from pre-implementation rates. Data review noted incomplete charts that were included within the initial documentation audits. Initially, only documentation within the AG Flowsheet was counted toward documentation rates. Chart reviews further noted that HCPs documented outside the AG flowsheet regarding CPS discussion and education. Therefore, adjustments in auditing were made to include any documentation within the well-child visit note regarding CPS education in addition to the AG flowsheet documentation.

### **Discussion of Major Findings**

The evidence found in the literature suggests that HCPs play an imperative role in injury prevention education for caregivers to the pediatric population. The evidence also indicates that HCPs require further instruction on CPS. Two out of six providers noted what they believed regarding CPS to be falsities following the initial educational presentation. One out of six providers reported being unfamiliar with local legislation regarding CPS and CSS. Five out of six providers were unfamiliar with the AG Flowsheet available within the EHR. The data confirmed statements by the AAP (2011) that HCPs require further education on CPS to serve the pediatric population better.

Other literature noted that health disparities could occur in patients with limited access to a pediatric HCP. As this agency serves underserved populations, and despite implementing this initiative, greater than 50% of the patients served during this time did not receive education regarding CPS according to post-intervention documentation rates. The agency served various individuals subject to health disparities based on race, ethnicity, and socioeconomic status.

## **Section V. Interpretation and Implications**

### **Costs and Resource Management**

The project's financial budget was created based on the potential costs of funding the employment of a project lead as well as other personnel time. Also included in the budget is the estimated cost of supplies such as educational materials for HCPs and caregivers. The time spent by the project lead included research, training, project development, interprofessional collaboration, implementation, management, evaluation, and analysis was equivalent to 175 hours. This equates to \$3,500. The time spent by providers during the educational setting was one hour, costing \$440. The cost of supplies included educational handouts for the providers, a quick reference guide for providers, educational pamphlets for caregivers, and 17 exam room posters, totaling \$301.25. The total estimated cost of the project was \$4,241.25. See Appendix D for an itemized budget.

This budget would increase for a more extensive scale implementation depending on the number of providers, exam rooms, and the volume of patients seen. A larger agency would require budgeting for time spent by informational technologists during the data collection process. To decrease costs associated with this project, time spent creating best practice advisories within the EHR will promote a straightforward approach to completing critical

documentation requirements. Collaboration with the informational technology department and EHR liaison would allow this change.

To the benefit of this agency, the total rate of CPS documentation rose and supported the project's cost. The total cost of traffic deaths in children in North Carolina was estimated to be \$66 million in 2018 (CDC, 2020a). One way to reduce this cost is to prevent injuries from occurring during an MVC. To prevent injuries related to an MVC, it is crucial to utilize CSS correctly. Provider commitment to the project would lead to the further success of this project and the promotion of childhood injury prevention. Successful implementation on a larger scale will increase the rates of CPS education shared with caregivers. With caregivers following the education, it would promote a decrease in childhood injury on a broader spectrum.

### **Implications of the Findings**

Participation in education-based activities by providers can impact the utilization of CPS-focused knowledge and discussion with caregivers. This led to enhanced caregiver knowledge. When caregivers understand what CSS to use and why, it can promote correct usage. This initiative continues to impact health and wellness through increased caregiver knowledge.

### ***Implications for Patients***

The increase in HCP knowledge leads to improved understanding within the population through education provided to caregivers regarding CPS. This initiative allows HCPs to reinforce safe habits and educate when lacking knowledge of CPS. As a result, the patients have safer experiences when traveling within a motorized vehicle. In addition, the patients are less likely to be injured or suffer a fatal injury when appropriately secured within a CSS.

### ***Implications for Nursing Practice***

This initiative focused on the influence providers have on patient knowledge through trust and rapport. Patients and caregivers seek advice from HCPs regarding safety, health promotion, and essential concepts associated with raising a child. Every member of the nursing profession strives to promote health. The advanced practice registered nurse seeks to improve population health and provide evidence-based care. This educational initiative merged the gap between providing quality care by building trust and rapport and improving population health by educating caregivers on safer evidence-based practice.

### ***Impact for Healthcare System(s)***

This initiative's impact on the healthcare system demonstrated the need for providers caring for pediatric patients to accept their responsibility in being aware of CPS guidelines and to provide anticipatory guidance on CPS. This included knowledge of best practice guidelines dependent upon age, development, height, and weight of the patient. While each state sets forth its laws regarding CPS, providers should be aware of the minimum requirements to verify that caregivers abide by local regulations. The HCP also recognized when patients and caregivers needed further information and resources. The providers should be aware of inspection stations, check-in events, CPSTs available within the area, and available resources. While a formal CPS educational intervention may not be feasible in every practice, each HCP that provides well-child services is responsible for knowledge of best-practice.

### **Sustainability**

Moving forward with the project, its sustainability is achieved through the continued dissemination of information during future well-child visits and follow-up appointments. While delivering the education is not always easy, the providers must document when it is completed. It may benefit the organization to utilize this information during community outreach events. A



partnership with local CPSTs or injury prevention programs will also encourage awareness in the community. This interdisciplinary approach allows community collaboration regarding the best strategy to promote community health and understanding of CPS.

### **Dissemination Plan**

This QI project will be formally presented at the university by the project lead on July 12, 2022. The presentation will consist of a 10-minute oral presentation and an associated poster. The project will also be published within the university's digital archive of scholarly work, The ScholarShip. The project will also be submitted to the Safe Kids Worldwide Research Department and Pediatrics the official journal of the American Academy of Pediatrics.

## **Section VI. Conclusion**

### **Limitations and Facilitators**

The limitations of this project included barriers to the initiation and timely data collection. The initiation of this project was delayed by scheduling issues due to the rise of COVID-19 cases in January and February of 2022. In addition, data collection was limited due to documentation not being completed in the anticipated standard time frame. The most significant limitation was provider adherence to CPS-focused discussion with caregivers and documentation of CPS education. While there were times that education was not directly provided during the encounter, there were also instances in which providers completed education but did not document it.

Facilitators of this project included the willingness of HCPs to participate in the project. In addition, the providers participated and engaged in the educational session and reached out to the project lead for questions or concerns throughout the implementation process. However, the greatest facilitator of the project came from the organization as a whole. Support was received

from the chief operating officer, director of clinical services, the quality improvement/quality assurance compliance officer, the providers, and medical assistants. These individuals ran the project's day-to-day operations to ensure educational materials were available and promoted during the project's duration.

### **Recommendations for Others**

To ensure the success of replicating this project, it would be most beneficial to provide rewards or recognition to those who meet a specific goal of disbursing education and improving documentation rates. Appropriate settings for further study would include primary care offices that serve pediatric patients or pediatric primary care offices. Utilizing a similar educational session for HCPs and support staff directly involved in patient care would continue to benefit project success. The providers would be educated on various CSS options and best practices based on age, development, height, and weight. The education would also include teaching points to provide to caregivers. The support staff would be educated on the educational handouts available for caregivers and ensure these are given to caregivers during well-child visits.

### **Recommendations Further Study**

At the current agency, it is recommended to continue disseminating knowledge to caregivers and promote improvement in provider documentation. The agency could participate in a community outreach event to assess CSS compliance amongst patients and community members. Collaborating with CPSTs for this event will allow thorough assessment and education for patients and caregivers. Further study may also involve reviewing provider likelihood to share knowledge following educational intervention and identifying gaps in provider knowledge pre- and post-educational intervention. A study to assess the reduction in local rates of childhood injury related to inappropriate car seat use based on interventions over time would continue to

promote the efficacy of this project. An alternate approach would include a partnership with the Reach Out and Read Programs to include CPS information within the books distributed during well-child visits.

### **Final Thoughts**

This project aimed to improve caregiver education rates regarding CPS in a primary care setting during well-child visits. An educational session for providers relating to AAP recommendations of CPS and discussion during well-child visits promoted the dissemination of knowledge to caregivers. Data was collected regarding documentation rates of CPS during well-child visits from birth to eight years old, showing a 7% increase in documentation rates due to the project's interventions. Continuation of a CPS initiative will promote enhanced provider and caregiver knowledge regarding using CSS appropriately in the pediatric population. With increased education rates, the initiative will contribute to a decreased rate of childhood injury and death related to incorrect child safety seat use.

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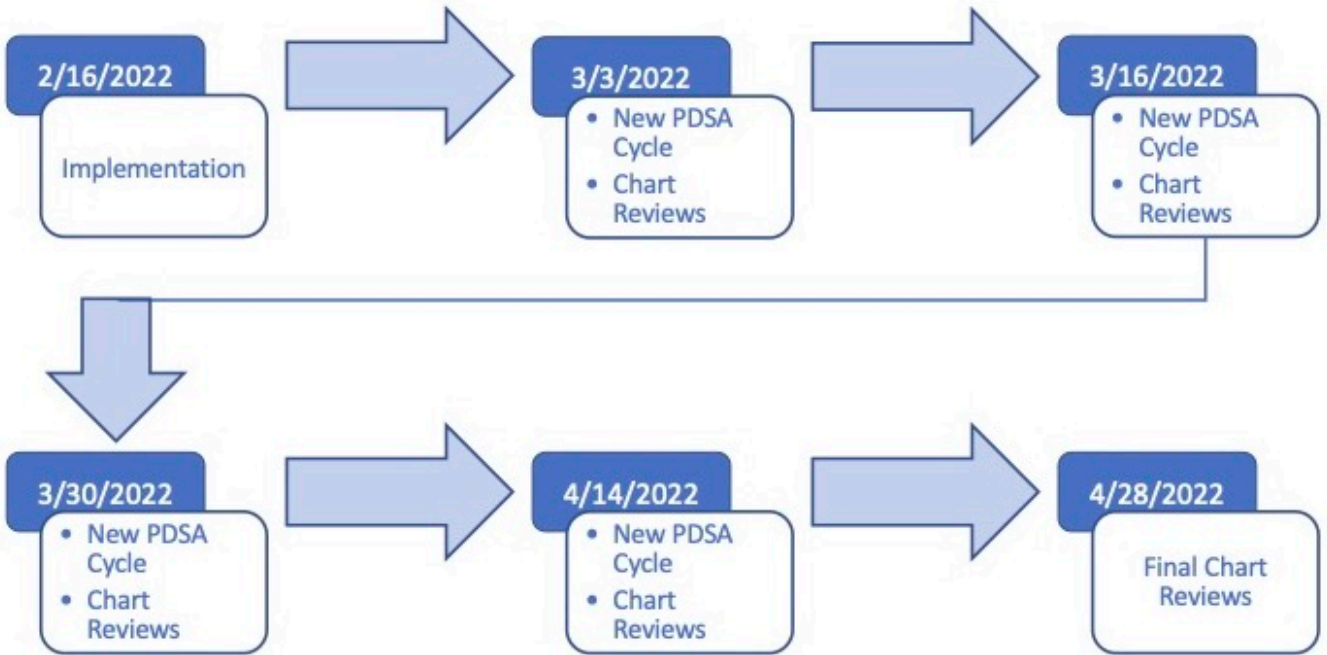
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## **Appendix A**

### Informal Interview Questions

1. Are you able to document the child passenger safety intervention in the patient's chart as directed?
2. Is there anything you have identified to help ease implementing this process? Have you identified barriers to providing child passenger safety information?
3. Have you identified anything that promotes sharing of child passenger safety information?

### Appendix B Project Timeline





**Appendix C**  
**Biweekly Data**

<b>Weeks</b>	<b>Total Well-Child Visits</b>	<b>CPS Documentation in AG Flowsheet</b>	<b>CPS Documentation in Visit Note</b>	<b>Total # of Documentation</b>
Pre-implementation	33	3	9	12
Weeks 1-2	17	5	3	8
Weeks 3-4	20	2	5	7
Weeks 5-6	19	4	2	6
Weeks 7-8	20	7	2	9
Weeks 9-10	23	9	4	13
<b>Implementation Totals</b>	<b>99</b>	<b>27</b>	<b>16</b>	<b>43</b>

**Appendix D**  
**Project Budget**

<b>Item</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Total</b>
<b>Project Lead Time</b>			
Time spent researching, training, development of project interprofessional collaboration, implementation of project, management, evaluation, and analysis of project.	175 hours	\$20/hour	\$3,500
<b>Physician Time</b>			
Time spent attending educational intervention (2)	1 hour	\$120/hour	\$240
<b>Advanced Practice Provider Time</b>			
Time spent attending educational intervention (4)	1 hour	\$50/hour	\$150
<b>Supplies</b>			
Provider Reference Guide	6	\$8/guide	\$48
Exam Room Posters	17	\$10/poster	\$170
Ream of Paper	1	\$8.25/ream	\$8.25
Ink	1	\$75/unit	\$75
<b>TOTAL:</b>			<b>\$4,241.25</b>