Implementation of a Safety Checklist and Guidance Tool During Well-Child Visits

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Abstract

Problem: Unintentional injuries are the leading cause of morbidity and mortality in pediatrics. Providers have difficulty with injury screening and prevention counseling during well visits due to a lack of time and nonstandard screening methods. **Purpose**: To implement the pre-visit electronic Safety Checklist and Safety Guidance Tool developed by CHADIS (Comprehensive Health and Decision Information Systems), at a pediatric clinic as an efficient and comprehensive approach to injury screening and the delivery of focused anticipatory guidance to caretakers. **Methods**: A pediatric practice elected to participate in a quality improvement initiative and implement the safety tool over a 15-week period. Age-specific safety checklists were auto-assigned by CHADIS to eligible patients two weeks prior to their well visit. Following checklist completion by caretakers, evidence-based safety guidance was electronically provided, focusing on topics of perceived risk based on results. Providers reviewed results in preparation for well visits to provide focused guidance to families. Data was collected weekly during the implementation period to determine the percentage of assigned safety checklists and the number of checklists completed. **Results**: Of the 418 eligible patients, 23% (n=95) were registered with CHADIS and auto-assigned the safety tool. Of those assigned the tool, 84% (n=80) of these caretakers accessed the checklist through their patient portal and 17% (n=14) of these caretakers submitted completed safety checklists. Providers reviewed 100% of the submitted checklists prior to the patient's visit.

Conclusions: Adoption of the Safety Checklist and Guidance Tool into the clinic's workflow processes was achieved within a 15-week period and was well received by providers and participating caregivers given their familiarity with utilizing CHADIS's screening tools routinely in their clinic. Providers felt that the safety tool's content facilitated visits and offered thorough

injury risk assessment and focused guidance to families without interrupting workflow processes during well visits. Barriers included getting patients registered with CHADIS and having caretakers complete and submit the safety checklists during implementation. Future quality improvement initiatives will have better success if patients are auto-registered and the implementation trial period is longer to make it possible to identify and mitigate the barriers to caretakers completing the CHADIS registration process.

Implementation of a Safety Checklist and Guidance Tool During Well-Child Visits

Unintentional injuries are the leading cause of morbidity and mortality in pediatrics ages 0 to 19 in the United States with more than 12,000 deaths and 9.2 million nonfatal injuries treated in the emergency department annually (American Academy of Pediatrics [AAP], 2012; Center for Disease Control and Prevention [CDC], 2019). Following recommendations by the AAP, professional societies, and national task forces, primary care providers (PCPs) recognize they can have a significant impact on injury prevention (IP) counseling as they have the unique opportunity to assess a child's health and developmental trajectory (Hagan, Shaw, & Duncan, 2017; AAP, 2015). The *Bright Futures Guidelines*, (Hagan et al, 2017) developed by the AAP, is the standard for child health surveillance and preventive services in the United States for which injury prevention (IP) counseling is referred to.

While IP counseling can entice families to change risky behaviors during well-child visits (WCVs), providers have difficulty delivering anticipatory guidance due to limited time during appointments and the need to cover numerous safety topics (Sanders & Mogilner, 2015). Despite this, PCPs may be the only source of anticipatory guidance a family receives, making WCVs critical encounters to review safety prevention (Sanders & Mogilner, 2015). With the improvement of healthcare technology and the emerging trend to avoid long waiting room times, utilization of pre-visit internet-based screening tools are considered best practice in the primary care setting as it is comprehensive and an efficient way to screen patients and review results during WCVs (Bergman et al., 2009). The purpose of this quality improvement project was to implement and evaluate the use of the CHADIS Safety Checklist and Safety Guidance computer-based tool as a method to provide pre-visit injury screening and the delivery of focused safety guidance to families in preparation for their upcoming well-child visit.

Literature Review

Five studies analyzing the use of technology-based interventions during routine WCVs and the effect of these technologies on injury prevention were reviewed. Details of this review and synthesis are outlined in Table 1 and Table 2. Four of the studies recruited participants that were eligible caregivers of children ranging between the ages of 0-5 years who sought routine well-child care at their pediatrician's office. The fifth study was a systematic review of 44 studies (Omaki et al. 2016) that implemented technology-based applications to evaluate changes in knowledge and behavior towards injury prevention and their effectiveness in ambulatory care settings. Results of this review showed great potential for the adoption and use of computer–based programs towards behavior changes and injury prevention.

A randomized controlled trial performed by Van Beelan et al. (2014) used the *E-Health4Uth,* a web-based, tailored home safety tool combined with personal counseling to determine the effect on parents' safety behaviors. Compared to the routine, generic written materials the control group received, *E-Health4Uth* was more effective in promoting several parental safety behaviors while at home and supports the application of this tool for the prevention of unintentional injuries while at home. Weaver et al. (2019) evaluated the computer tablet program, *RISE Up!,* which provides tailored reports promoting positive parenting and injury prevention behaviors to caregivers. Participants who completed the *RISE Up*! tool reported an improvement in parenting strategies and a decrease in unintentional injury risk compared to participants who did not complete the assessment. The *RISE Up!* tool exhibits promise for the adoption of positive parenting practices and prevention of injury.

Brixey et al. (2014) piloted the *Safe N' Sound* program in pediatric clinics, a kiosk-based injury prevention and risk assessment tool. Researchers tracked product distribution and

participant responses and concluded that this tool could be successfully integrated into busy pediatric practices and is effective at screening for risky safety behaviors and providing tailored guidance. The *Safe-N'-Sound* program was also examined by Weaver et al, (2011) who tracked its use, completion rates, and sustainability during the implementation period. Results support its utilization in practice-based settings and effectiveness at screening for injury risk and delivering guidance.

All interventions in this review focused on evaluating the effectiveness of technology-based injury prevention programs and the effect on safety knowledge, behavior, caregiver practices, and anticipatory guidance delivery for practitioners. With the exception of the systematic review by Omaki et al. (2016), convenience sampling from university affiliated, pediatric centers and outpatient clinics was utilized. Furthermore, control groups in these studies practiced their routine method for anticipatory guidance delivery. Results of this evidence review suggest that computer tailored approaches are well received by users, cost effective, becoming more routinized over time, and advantageous over generic strategies by facilitating well-child visits and providing more thorough safety guidance.

Studies in this evidence review were rated for strength and quality using the JHNEBP Evidence Rating Scale (Newhouse, 2006). Study strength ranges from levels I –V, with lower levels indicating stronger evidence. Study quality ranges from A-C, with A indicating the highest quality. Study designs, sample size, trial duration, and quality of evidence varied among these studies. Weaver et al's. (2019) prospective cohort study ranked a Level IV on the level of evidence hierarchy and was assigned a quality rating of C due to their small sample size, short trial period, and study limitations (Newhouse, 2006). The prospective cohort studies by Brixey et al. (2014) and Weaver et al. (2011) ranked a Level IV on the level of evidence hierarchy and

were assigned a quality rating of B, as they had moderate sample sizes and short trial periods yet inconsistency in their findings and biased data. The randomized controlled trial by van Beelan et al. (2014) ranked a Level II for evidence and assigned a quality grading of A for their large sample size, long trial period, and adequate generalizability of results. Lastly, the systematic review by Omaki et al. (2016) ranked a Level I for evidence with a quality grading of A for their large sample of well-defined studies with reproducible search strategies.

Theoretical Framework

Nola Pender's Health Promotion Model (Figure 1) explores different components and relationships that contribute to health-promoting behaviors that enhance quality of life (Srof, & Velsor Friedrich, 2006). This model emphasizes that infant and childhood development is characterized by rapid physiologic and cognitive transitions where behavior specific cognitions and affect are learned through interpersonal and environmental influences and barriers. These experiences influence one's past, present, and future behavior towards injury prevention. Education through anticipatory guidance in the primary care setting raises awareness of the causes of unintentional injuries, intending to motivate individuals to engage in health promoting actions directed towards the prevention of injuries and the enhancement of health. The Health Promotion Model can be applied to the concept of unintentional injuries. Use of the CHADIS Safety Checklist and Guidance tool is used to educate families with health promoting activities that may expand their knowledge and lead parents to incorporate behaviors focused on injury prevention.

The Conceptual Framework of Complex Innovation Implementation (Figure 2), as described by Helfrich et al, (2007) identifies the use of an "innovation champion" as a strategy that advocates for use of the innovation by supporting and driving efforts to overcome

organizational resistance to the practice change. In addition to having champions, management support, financial resource availability, and implementation policies and procedures, implementation values must fit with the practice site for the implementation climate to be receptive to the innovation and allow for implementation effectiveness (Helfrich et al, 2007). Using this framework, the practice site identified two pediatric practitioners as the "champions" who were responsible for implementing the CHADIS Safety Checklist and Guidance tool. As innovation champions, they supported the structure, process, and outcome goals identified for the practice site and supported efforts to have all eligible parents complete the Safety Checklist and Guidance tool. Champions promoted usage of the safety tool to facilitate a favorable climate for implementation effectiveness, which prioritized pediatric safety.

Methods

This quality improvement project took place at a pediatric clinic that offers behavioral assessments, routine well child visits, and urgent sick visits. The population is culturally and ethnically diverse, serving low-income and Medicaid insured families who often miss their scheduled appointment. During the fall and winter seasons, approximately 16 well-child visits are scheduled daily. All eligible patients, including vulnerable populations, were asked to participate. Participating staff included one pediatric nurse practitioner and one pediatrician. An email reminder was sent to parents or guardians of eligible patients that were registered with CHADIS to complete the pre-visit safety checklist prior to the child's upcoming well visit. Upon completion and submission of the checklist, the parent or guardian received tailored and focused safety guidance to review. Providers also received these results to review prior to the appointment so they could discuss the focused safety guidance during the well-child visit.

Process flowcharts of the current versus the desired workflow processes following implementation of the safety tool in the clinic are depicted in Figure 5a and Figure 5b.

Several strategies and tactics were utilized that facilitated and impacted implementation progress. These included identifying, preparing, and training the site champions and staff on the use of the safety tool at the start of implementation (Appendix A). Assessing the champions' readiness for implementation was an instrumental tactic when incorporating this tool into the clinic workflow. Educating families on the tool and encouraging them to use it was an ongoing strategy to increase the number of participants. Technical assistance and ongoing clinical support to the staff was offered and available throughout the implementation period to ensure proper functioning of the tool and provide additional CHADIS registration options (Appendix B). Weekly check-in meetings occurred with participating staff as a communicative strategy to maintain relations and address any questions, concerns, or technical issues. These strategies and tactics were critical to help meet the structure and process measures of this quality improvement initiative. In addition, they contributed to the success of implementing the practice change at this clinic site and helped better identify barriers and facilitators after adopting the tool and its effect on workflow processes.

In preparation for implementation, the CHADIS account manager made the tool electronically available to families through their patient portal as well as give access to the providers to view and analyze safety checklist results through their individual CHADIS provider accounts. These structure measures were essential for implementation to occur and were tracked as a benchmark for when data collection could start. The number of safety checklists electronically delivered, accessed, completed, and submitted by parents prior to well-child appointments was tracked at the clinic and recorded on a weekly basis (Appendix C). This data

was informative in regards to the process of utilizing the new safety tool and its adoption by both the pediatric clinic and the families. Standard HIPAA (Health Insurance Portability and Accountability Act) practices were used for data collection and no patient health information was collected or recorded. All data collected was placed on a secure and password-protected spreadsheet to protect patient and provider confidentiality. The project was submitted to the University of Maryland Institutional Review Board (IRB), and it was determined that the project was exempt from IRB review.

Results

Process measures were analyzed for shifts and trends using one run chart and a table to interpret implementation effectiveness. The run chart displaying the "Safety Checklists Assigned Prior to Well-Child Visits," (Figure 3) demonstrates that 23% (n=95) of eligible patients were registered with CHADIS and received the safety checklist, 84% (n=80) of these patients who received the tool had parents who accessed it, and 17% (n=14) of those who accessed the tool, completed and submitted the safety checklist. The numerical data consistently remained the same each week, indicating no trends, runs, or shifts to report. The total number of assigned checklists on a weekly basis was low and averaged approximately six checklists per week, indicating that only 95 of our 418 eligible families within the practice were registered with CHADIS, which was a notable barrier to the number of eligible patients receiving the safety tool.

Of the eligible patients who received the safety tool, 84% (n=80) accessed the safety checklist through their CHADIS patient portal. This indicates that the majority of registered patients were able to access and look at the safety checklist, even if they did not finish or submit the safety tool. Of the 80 eligible families that accessed the safety tool, 17% (n=14) of the families completed the safety tool and submitted it for results and safety guidance review. The

table titled, “Submitted & Reviewed Safety Checklists,” (Figure 4) displays data showing that the providers reviewed 100% of the Safety Checklist results that were submitted throughout implementation. Despite the number of submitted safety checklists (n=14) being low, the providers routinely checked for completed screening results prior to well visits and reviewed them. A focused discussion was provided to caregivers on the screens that were submitted during their appointment. The outcome goal of the providers to review and discuss all results during well-child visits was successfully achieved and has been incorporated into the standard processes of the clinic’s workflow.

Discussion

Implementation of the Safety Checklist and Safety Guidance Tool was well received by the clinic providers and participating families. The providers expressed perceived improvement in workflow processes when the safety tool was properly utilized by caretakers and completed in preparation for well visits. It is important to note that implementation of this safety tool could not have occurred without the assistance of the CHADIS practice account manager, who made the tool electronically available to access through the CHADIS patient and provider account portals. This allowed access for caretakers to complete the tool once it was assigned to them and the providers the ability to view and analyze safety checklist results. While completion of the safety checklist by caretakers was not always achieved prior to the visit, the providers were able to routinely check for results 100% of the time given their current process already involved checking for other CHADIS questionnaire results before visits. Providers did feel that the content of the safety checklist and guidance being offered was comprehensive and educational. Evidence shows that electronic safety screening tools offer thorough injury risk assessment, standardization in safety assessment and guidance, workflow efficiency, improvement of

caretaker knowledge and behaviors towards safety, and provide evidenced-based updates on pediatric safety for clinicians and families [(Brixey et al. (2014); Omaki et al. (2016); Van Beelan et al. (2014); Weaver et al. (2011); Weaver et al. (2019)].

While the benefits of electronic safety screening tools were appreciated during the implementation period, the major barrier not anticipated or accounted for was the pre-existing lack of patient registration with CHADIS at the start of implementation and the challenge of encouraging families to register during the 15-week trial period. To address this barrier, a registration QR code (Appendix B2) and the "quick-enroll" option for in-person registration at the clinic was obtained from the CHADIS account manager, reviewed with the staff, and utilized in the clinic. These additional options were intended to enhance and facilitate CHADIS registration so more families could receive the safety tool. It was too soon to assess the effects of this strategy during and following the implementation period yet the providers felt that these registration methods were helpful in getting patients registered with CHADIS who were less likely to register on their own, independent from the office visit. These registration options continue to remain available for the practice to utilize.

Several limitations affected usage of the tool as it was implemented during the COVID-19 pandemic. Due to precautions of the pandemic, there were changes with scheduling that often limited the number of well-child visits in a day to reduce crowds in waiting rooms and contact exposures. In addition, many families were unwilling to go into medical facilities for routine visits during the pandemic unless it was emergent, impacting the number of eligible patients that could participate. Staffing shortages due to turnover and illnesses occurred during the implementation period as well, which shifted workloads and increased responsibilities onto other staff members. This resulted in the safety tool not being a priority to the staff members during

these challenging times. This quality improvement initiative, as with all quality improvement initiatives, is context specific and the results are not generalizable. These results can inform future implementation efforts.

Conclusion

Implementing the electronic CHADIS safety tool can offer thorough injury risk screening and focused guidance to families without interrupting workflow processes during well-child visits. Electronic screening methods can facilitate workflow processes by decreasing the time spent on in-person injury risk assessment and providing focused anticipatory guidance during well visits. The option to access the safety tool electronically (via computers, tablets, and smart phones) allowed for flexibility and convenience for caretakers and staff, which assisted in their adjustment with the change in workflow processes and their support to sustain it. This makes it a valued tool for families and providers, making it highly likely to be sustained at pediatric practices that utilize CHADIS as a platform for online screening forms and tools.

Future quality improvement projects may include a longer implementation trial period for the safety tool, as a 15-week period was not felt to be enough time to observe any notable runs, trends, or shifts in the usage of the safety tool. Additionally, it would be recommended to analyze the success of this safety tool and its adoption if implemented at a pediatric practice with a larger patient population with more providers and when the COVID-19 pandemic is less of a public health concern. Lastly, understanding the barriers related towards CHADIS registration and how clinics can encourage or families to register with CHADIS would be very important to learn. This information would help improve usage of the safety tool, overall success and adoption of the safety tool, as well as the long-term impact the tool has on educating providers and families on safety practices.

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Weaver, N.L., Nansel, T.R., Williams, J., Tse, J., Botello-Harbaum, M., Willson, K. (2011). Reach of a kiosk-based pediatric injury prevention program. *TMB*, *1*, 515-522. DOI: 10.1007/s13142-001-0066-7

Weaver,N.L., Weaver, T.L., Loux, T., Jupka, K.A., Lew, D., Sallee, H. (2019). The impact of RISE Up! in promoting positive parenting and safety behaviors of parents with young children. *Children and Youth Services Review, 105*. http://doi.org/10.1016/j.childyouth.2019.104422

Table 1

Evidence Review Table

Citation: Omaki, E., Rizzutti, N., Shields, W., Zhu, J., McDonald, E., Stevens, M.W., Gielen, A. (2016). A systematic review of technology-based interventions for unintentional injury prevention education and behavior change. *Injury Prevention*, 0, 1-9. doi:10.1136/injuryprev-2015-041740					Level (JHNEBP): I Systematic Review
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
"To address whether technology-based interventions (computer and mobile devices) are effective in improving knowledge and behavior for the prevention of unintentional injuries."	Systematic review (SR) conducted by a panel of researchers who specialize in injury research, injury policy, and/or mobile health technology	Sampling Technique: A search was conducted using six databases between February 2014 to March 2015 # Eligible: 99 studies # Accepted: 44 studies # Excluded: 55 studies PRISMA: Chart included with detailed criteria for inclusion and exclusion of studies from the SR. Power Analysis: Not applicable to SR critique.	Control: No intervention or alternative intervention provided. Controls varied between the studies included in the SR Intervention: Interventions were designed for pediatric injury prevention: 14 programs designed for children, 7 programs targeting parents, 2 programs targeting pediatricians, and 1 program designed for preschool staff. The four kiosk programs targeted parents of young children in clinical settings and covered many injury topics. Intervention fidelity: Not applicable to SR critique	DV: "Changes in injury prevention practices" followed by observed behavior, and self-reported behaviors or intentions. Measurement tool (reliability), time, procedure: Researchers used narrative analysis and descriptive statistics where meta-analysis was not possible in the reviewed studies. Researchers pulled data from all selected articles.	Statistical Procedures(s) and Results: Computer and mobile technology-based interventions showed promise at increasing knowledge and promoting behavior changes towards unintentional injury prevention. The number and breadth of technology-based injury prevention programs is also promising

Citation: van Beelen, M.E., Beirens, T.M., den Hertog, P., van Beeck, E.F., Raat, H. (2014). Effectiveness of web-based tailored advice on parents' child safety behaviors: randomized controlled trial. *Journal of Medical Internet Research, 16*(1), e17-e36. doi:10.2196/jmir.2521					Level (JHNEBP): II Randomized Controlled Trial
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
Purpose: "To evaluate the effect of *E-Health4Uth*, a web-based, tailored, safety information program, combined with personal counseling on parents' child safety behaviors for the prevention of falls, poisoning, drowning, and burns." Hypothesis: "Parents in the *E-Health4Uth* home safety intervention group will show less unsafe behavior with a lower total risk score 6 months post intervention compared to those parents in the control group."	Randomized controlled trial (RCT)	Sampling Technique: Opportunity and convenience sampling of 26 youth health organizations in the mixed urban-rural provinces in the Netherlands Eligible: Parents of infants between 5 to 8 months of age needing routine 11-month well-baby visits between June 2009 to December 2010 were invited to participate (n=3147). Excluded: Families who did not wish to participate despite eligibility. Accepted: Parents who provided informed consent were accepted (n=1409) Control: 687 parents Intervention: 696 parents	Control: Provider discussed safety and provided them with a generic safety information leaflet at the 11-month well-child visit (care as usual). Follow-up self-report questionnaire given 6 months after the visit. Intervention group: (a) *E-Health4Uth* home safety module aimed at four safety topics was provided one month prior to routine well-child visit, (b) Discussion with pediatric provider of the tailored safety advice at the well-child visit (c) Email reminder of tailored safety advice and implementation-intention plan to strengthen the message four weeks after visit, (d) Follow-up self-report questionnaire given 6 months after the visit	Dependent Variable(s): Parent's child safety behaviors for the prevention of: (1) falls, (2) poisoning, (3) drowning, and (4) burns were accessed. (5) *Effectiveness of the E-Health4Uth home safety module* Measure(s): 1. Total risk score was calculated for each parent. A maximum of 32 points could be obtained, with a higher score indicating more risky or unsafe behaviors. 2. Evaluation of the *E-Health4Uth* module was assessed using a web-based evaluation form consisting of a 5-point Likert scale. Objective measure of parent's exposure was obtained from log-in data and usage of the program.	Statistical Analysis: 1) Intention to treat analysis and descriptive statistics were used to describe the characteristics in the two study conditions. Differences between the intervention and control groups were tested with *t*-test or the Mann- *U* test and chi-square test. 2) Logistic regression analyses were performed for all specific safety behaviors and total risk scores. Results: Intervention group showed significantly less unsafe behavior compared to parents in the control group.

Citation: Brixey, S.N., Weaver, N.L., Guse, C.E., Zimmermann, H., Williams, J., Corden, T.E., Gorelick, M.H. (2014). The impact of behavioral risk assessments and tailored health information on pediatric injury. *Clinical Pediatrics*, *53*(14), 1383-1389. DOI: 10.1177/0009922814549544					Level (JHNEBP): IV Prospective Cohort Study
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
"To describe a 7-month pilot using technology (kiosk) to facilitate injury prevention risk assessment and education integration."	Prospective cohort study conducted at the Downtown Health Center (DHC)	Sampling Technique: Systematic and convenience sampling Eligible: All English speaking caregivers of eligible patients 0 to 4 years old who sought preventive primary care services between July 1, 2011- Jan 31, 2012. (n=2091) Excluded: Patients who were called back to the examination room prior to completing the survey and receiving printed materials. Non-English speaking families/caregivers. Accepted: Participants who assessed the kiosk (n=1368) Control: Participants who did not complete the SNS assessment (n=525) Intervention: Participants who completed the SNS assessment (n=843)	Control: Incomplete or no SNS risk assessment performed at well-child care visits. Intervention: Completion of the SNS risk assessment at well-child care visits. Participants were given a "Prescription for Safety" with a unique bar-coded visit number. When inserted into the kiosk, the *Safe N' Sound* assessment is taken and identifies the two highest priority injury prevention measures based on selected answers and generates tailored safety assessment for the caregiver.	Dependent variable(s): (1) *The completion rate of SNS over the implementation period* and (2) *the top two priority injury types by age group*, (3) *The occurrence of an injury-related visit* Measures: Data was tracked and collected from the kiosk, downloaded from the database and reviewed monthly to generate clinic reports and assess data quality. Unintentional injuries were assessed using E-codes, which were then categorized to reflect injury topics addressed by the DHC SNS kiosk	Statistical Analysis: Fishers exact test was used to conduct comparisons of the distribution of injury types between the DHC and the CHW children, by age group. Statistical Results: Detailed results for the statistical analysis reported above were not reported in this article. Conclusions: Use of electronic devices in pediatric settings was successful in screening and providing needed safety information that may impact injury outcomes and improve patient flow. This approach is encouraged as a communication strategy to support families in making changes to injury prevention to improve child safety.

Citation: Weaver, N.L., Nansel, T.R., Williams, J., Tse, J., Botello-Harbaum, M., Willson, K. (2011). Reach of a kiosk-based pediatric injury prevention program. *TMB, 1*, 515-522. DOI: 10.1007/s13142-001-0066-7					Level (JHNEBP): IV Case-Control Study
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
"To evaluate the implementation of injury prevention *Safe-N-Sound* (SNS) program in routine clinical practice and examine program use and completion rates."	Case control study 3-6 month pilot study	Convenience sampling within a local network that were randomly selected based on eligibility Eligible: 23 clinics (n=11,884) Excluded: 11 clinics Included: 5 clinics	Control: Incomplete or no SNS self-assessment performed at well-child visit Intervention: Eligible parents completing the SNS program, a self-assessment of childhood injury risk factors during well-child visits	Measures: (1) *Kiosk use*- entering any information into the kiosk, (2) *kiosk completion*- eligible potential users who completed the kiosk assessment, (3) *physician role*- the number of patient charts that included the physician SNS feedback relative to the number of eligible users.	Analysis: Conducted using SPSS 17 (statistical software). Usage rates for each clinic site were compared using Marascuilo procedure for comparison of multiple proportions, and descriptive statistics for the user characteristics were generated Conclusion: An average of 10.2% of parents used the program to some degree, 7.6% completed the program, and total use across the study period at the five clinics varied from 6.5%- 9.7%. Program completion across the study period ranged from 5.4% to 7.3%. No statistical differences between clinics in the total percent of either users or completers. Changes in program use and completion to continuation varied between clinics.

Citation: Weaver,N.L., Weaver, T.L., Loux, T., Jupka, K.A., Lew, D., Sallee, H. (2019). The impact of RISE Up! in promoting positive parenting and safety behaviors of parents with young children. *Children and Youth Services Review, 105*. http://doi.org/10.1016/j.childyouth.2019.104422					Level (JHNEBP): IV Prospective Cohort Study
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
"To examine the extent to which a brief tailored parenting program (RISE Up!) administered in a pediatric clinic can change high-risk parenting behaviors."	Prospective cohort study Within-group, pre-post test with self-reported outcome measures Trial ran from July 2013- May 2014	Convenience sampling of a pediatric clinic in a large Midwestern children's hospital Eligible: Parents of a child 5 years old or younger Included: n=125 parents	Control: Parents who did not complete the RISE Up! assessment Intervention: Parents who completed RISE Up! assessment on a tablet computer and then received a tailored, printed report that provided recommendations to address the personal high-risk parenting practices identified by the assessment.	Dependent Variable(s) & Measures: (1) Safety behaviors related to unintentional injury were measured by questions assessing injury risk (2) Caregiver adoption of safety behaviors- measured by questions directly asking if caregiver tried any of the recommendations provided (3) Self-report of behavior change by using communication mediators at follow-up	Analysis: Chi-squared tests compared demographic variables and communication mediators. Binary logistic regressions identified demographic predictors of improved parenting stress and decreased injury risk. Results: 75% of parents tried one of the recommendations in their safety report, with 53% having different parenting risks areas, and 33% of parenting risk scores decreasing after using RISE Up! Race, education, and communication mediators were significantly associated with program effects Conclusion: RISE Up! shows promise for universal prevention to promote the adoption of parenting practices to reduce injury risk and promote positive parenting behaviors

Table 2

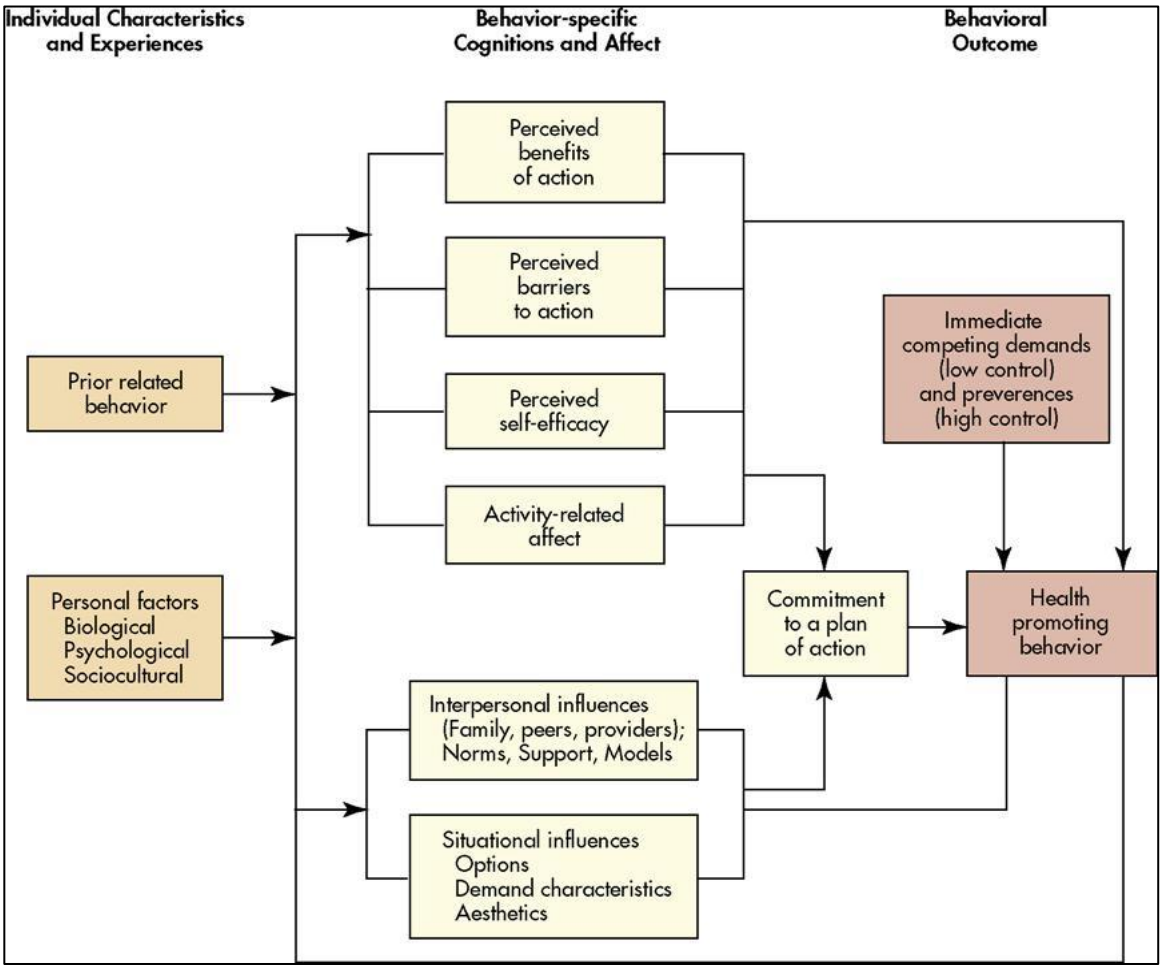
Evidence Synthesis Table

Evidence Based Practice Question (PICO): Can technology-based safety screening tools be successfully integrated into pediatric clinics to effectively screen families for risky safety behaviors and enhance provider counseling on injury prevention guidance compared to the standard counseling offered at well-child visits?			
Level of Evidence	# of Studies	Summary of Findings	Overall Quality
I	1	Omaki et al. (2016) systematic review found that computer-and-mobile technology-based programs used at increasing knowledge and behavior for unintentional injury prevention showed great promise. This review summarized 44 studies with strong evidence that support computer-based programs being effective in conveying safety information and influencing how participants think about injury prevention and adoption of safety behaviors.	(A) This systematic review had reproducible search strategies with a comprehensive and thorough search and review strategy. The articles included were well-defined studies where aims, measures, interventions and outcomes were clearly reported. Many of them were strong randomized, controlled designs, which strengthened reliability and validity, although many were not adequately powered and only a few attempted to blind participants. The measures and results were consistent across the studies.
II	1	van Beelen et al. (2014) concluded that compared to generic written materials for safety counseling, the E-Health4Uth safety module combined with counseling during well-baby visits promotes safe behavior towards child injury prevention for safe staircases, storage of products, drowning, and burns. There was positive feedback by both parents and child health care professionals about the E-Health4Uth safety module and this study supports the application of web-based tailored, safety advice for the prevention of pediatric unintentional injury in the primary care setting.	(A) This study was well powered and the randomized controlled design strengthened internal validity. The sample size was large and the computer-generated randomization optimized blinding. The generalizability of the results was considered adequate, although it may have been slightly affected due to the dropout rate (although low) being higher among parents of lower socioeconomic status. Bias, due to concern of inaccurate responses or socially desirable answers, was addressed by ensuring confidentiality. The outcomes were appropriately measured with definitive conclusions supported by statistical data. Recommendations were consistent with reviewed and current literature. Future studies are recommended with an even larger sample size to ensure generalizability of results as well as consider the use of mobile applications (phones & tablets) for this intervention.
IV	3	Brixey et al. (2014) conclude that the kiosk-based injury-screening tool (*Safe N' Sound*) can be successfully incorporated as best practice standard of care for a clinic. Results also support the notion that post intervention injury rates are decreased for children who received this screening and education compared to those who do not. These authors support the adoption of electronic communication strategies to support clinicians and families in making behavior changes to improve child safety with minimal impact on patient flow in the clinic.	(B) This prospective cohort study had an adequate sample size and took place over a time period of 7-months yet there was not enough power in the number of patients screened and injured to establish statistical significance. Concerns for bias were in relation to self-reported data where safety behaviors may have been overestimated. The majority of participants were reported to be minorities of lower socioeconomic status which threatens generalizability yet arguably supports the notion that this intervention may be successful at reaching this population and maintaining compliance in a demographic of higher need for it. The statistical analysis was described but the data results were not clearly reported. The recommendations were consistent and clear.

		Weaver et al. (2011) concluded that technology based injury prevention programs (*Safe-N-Sound*) are effective and useful to change parental behaviors towards preventing injuries in community settings. Findings also indicate that these methods for dissemination of evidence-based public health programs, particularly in practice-based clinical settings are useful and that computer-tailored approaches have shown an advantage over generic strategies, have been well-received by users, and may be cost-effective.	(B) This case study had an adequate sample size and took place over a two-year period at a large medical institution. The findings were not fully consistent with expectations due to minimal project support during the maintenance phase. Implementation phase was only nine months, indicating that it was not a long enough period for a new process to become routinized in a clinic environment. Staffing and wireless technological constraints also limited its sustainability as well as caused unique barriers to plan. Future work applying translational research is recommended to sustain long term change about factors that influence application of technology into organizations and plan for sustainability.
		Weaver et al. (2019) concluded that the technology based injury prevention program (RISE Up!) is effective and shows promise for universal prevention to promote adoption of parenting practices to reduce injury risk and increase positive parenting behaviors and reduce the risk of child abuse and neglect.	(C) This prospective trial conducted over a 3 to 6 month period had a small sample size. The evaluation design had some limitations that did not allow for follow up with every high-risk parenting area identified, as screening assessments were minimal in length. Social desirability bias may have influenced these results as well based on demographics. The high attrition rate may weaken the generalizability of the results of the study.

Figure 1

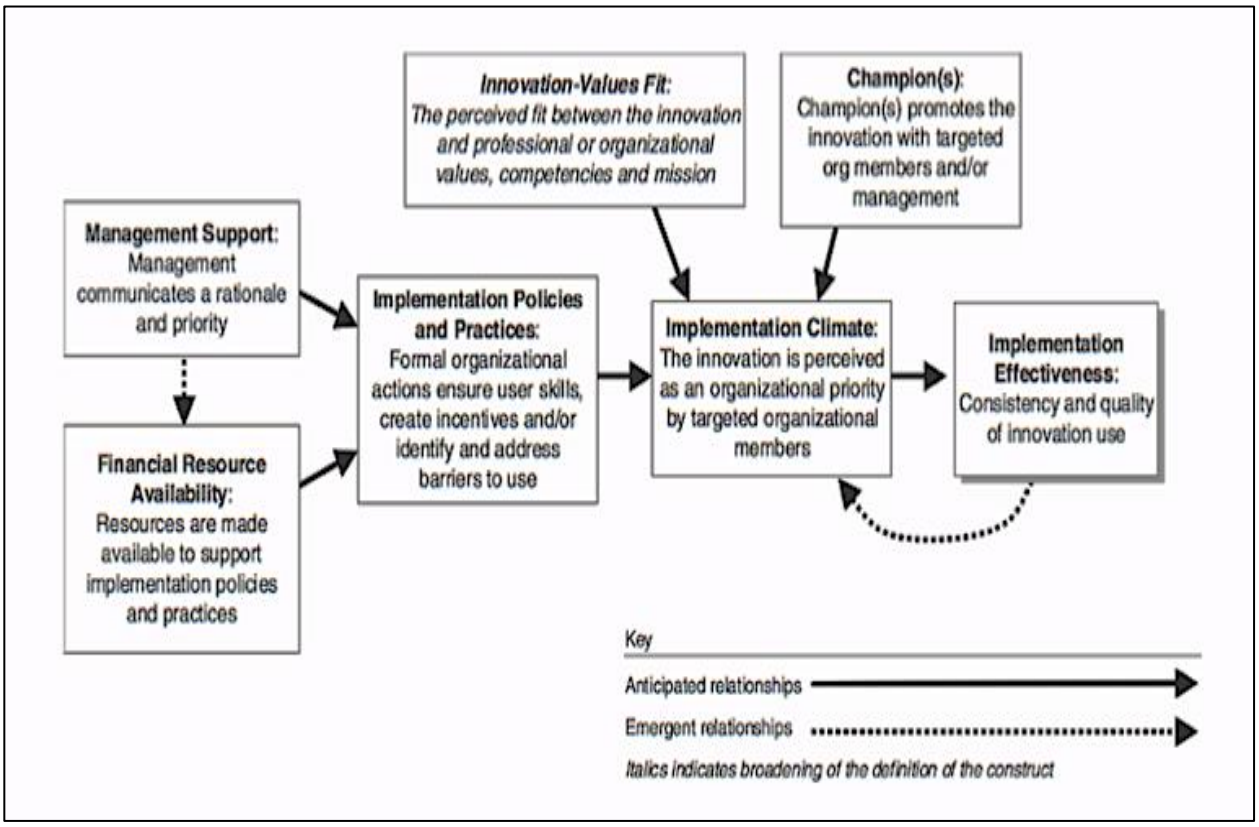
Health Promotion Model



Note. Pender et al, (2011)

Figure 2

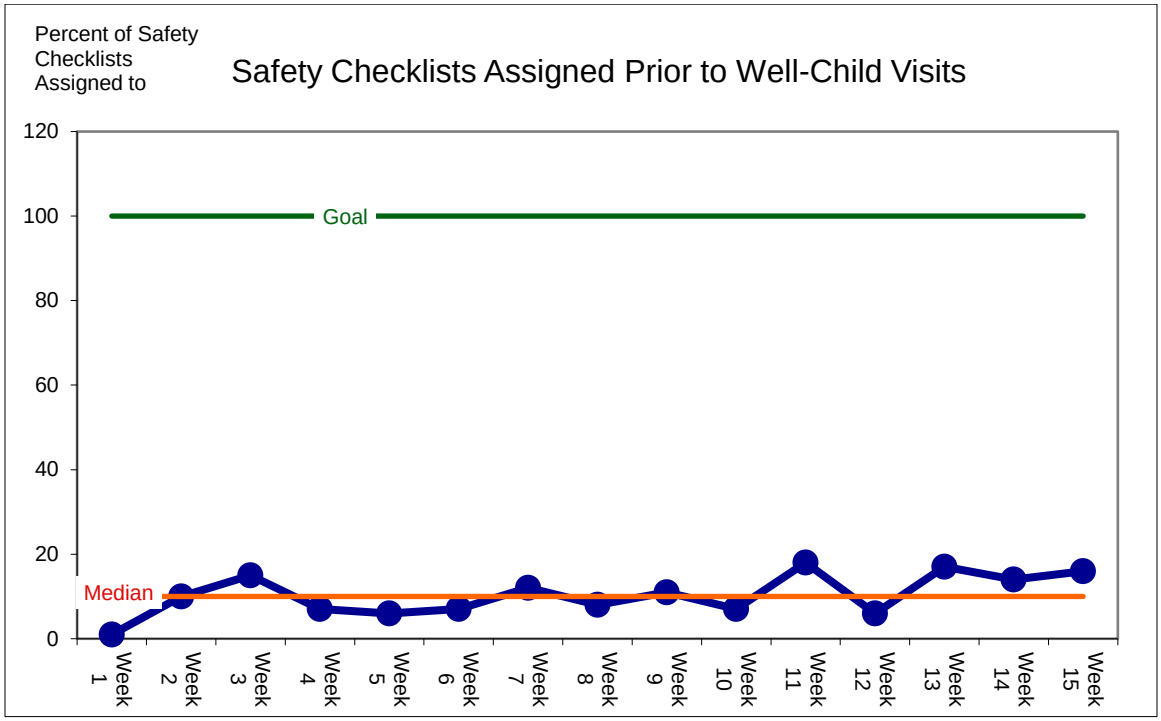
Conceptual Framework for Complex Innovation Implementation



Note. Helfrich, et al.'s (2007) modification to the Klein and Sorra Framework

Figure 3

Safety Checklists Assigned Prior to Well-Child Visits



Note. Percentage of assigned safety checklists to eligible patients

Figure 4

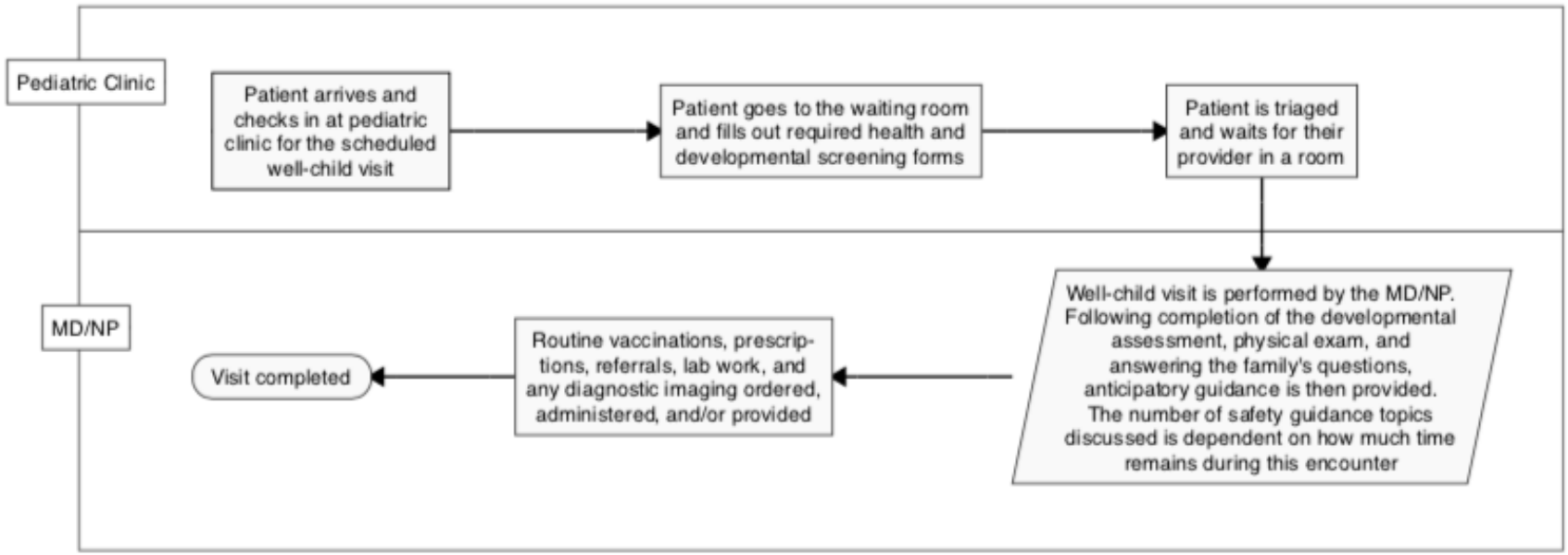
Submitted and Reviewed Safety Checklists

Submitted & Reviewed Safety Checklists		
Week(s)	**# of Checklists Submitted**	**# of Checklists Reviewed**
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	2	2
8	0	0
9	1	1
10	0	0
11	1	1
12	0	0
13	1	1
14	2	2
15	1	1
Total	**14**	**14**

Note: Submitted and reviewed safety checklists during a 15-week implementation period

Figure 5a

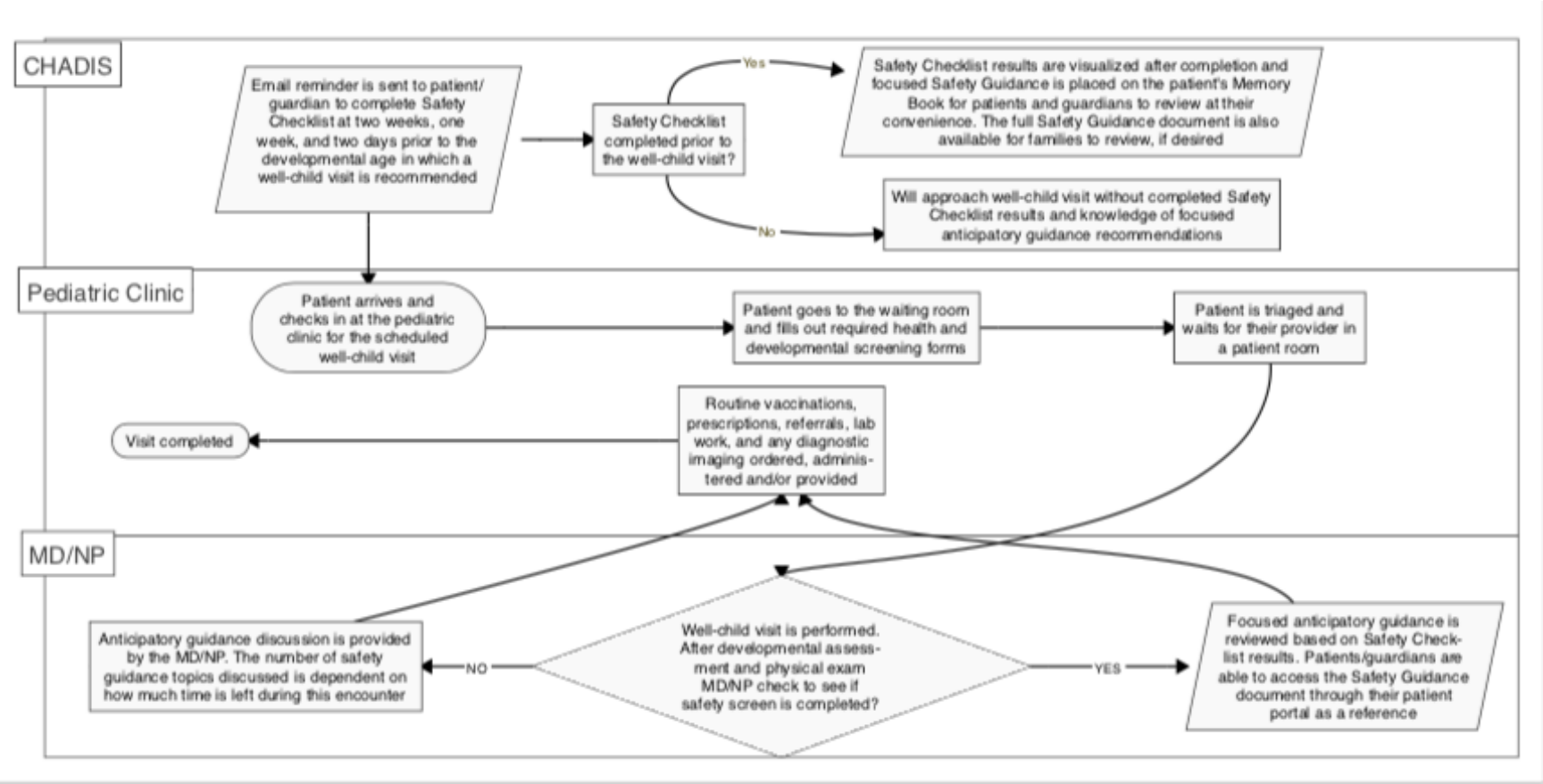
Flowchart of the Current Process for Safety Screening and Delivery of Guidance During the Routine Well-Child Visit in the Pediatric Clinic



Note: Workflow process prior to implementation of the CHADIS Safety Checklist and Safety Guidance Tool

Figure 5b

Flowchart of the Desired Process for Safety Screening and Delivery of Guidance During the Routine Well-Child Visit in the Pediatric Clinic



Note: Workflow process following implementation of the CHADIS Safety Checklist and Safety Guidance Tool

Appendix A

Data Collection Tools

Date of Training Completed with Providers	Completed CHADIS Demonstration with the Account Manager and Quality Improvement Project Lead (Y=1/ N=0)

Date	Safety Tool made available to all patients by Account Manager (Yes = 1, No= 0)	Results Made Accessible for Providers (Yes = 1, No = 0)

Figure 1. Provider Training on CHADIS Safety Checklist and Guidance Tool (Structure Measures)

Appendix B

Implementation Tools

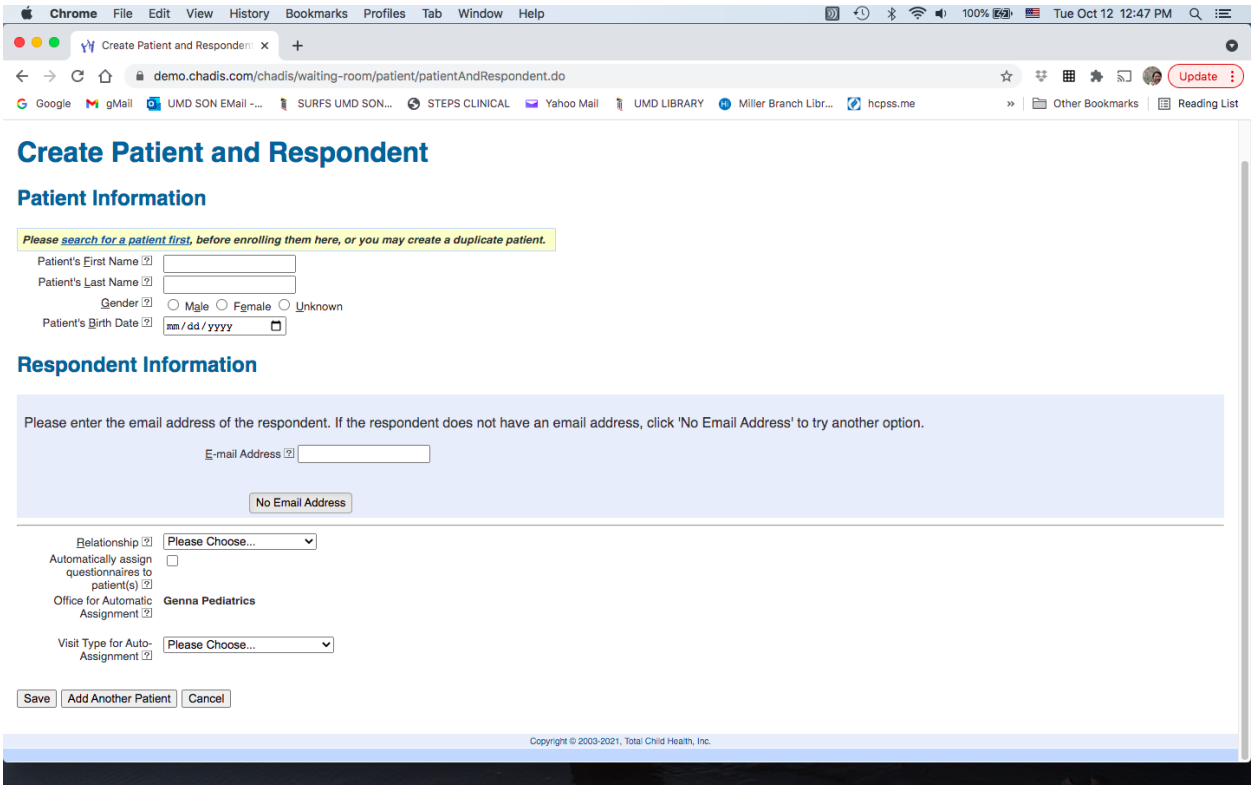


Figure B1. CHADIS Quick-Enroll Patient/Respondent Registration

Figure B2. QR Code Access for Quick Enroll CHADIS Registration

Appendix C

Data Collection Tools

Questionnaire ID	Total Checklists Assigned	Total Checklists Accessed	Total Checklists Submitted	Total Checklist Assigned but not Submitted	Total Checklists Not Complete by Expiration Date

Total Checklists Cancelled by the Provider or Patient	Total Reports Reviewed by the Provider

Figure 1. Completed Safety Checklists and Reviewed Results (Process Measures)