

PRACTICING SAFETY

Quality Improvement Innovation Network (QuIIN) Project

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Practicing Safety
Data Analysis Report

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Introduction

The overall aim of the American Academy of Pediatrics' (AAP) Doris Duke Charitable Foundation-funded *Practicing Safety* program was focused on the prevention of child abuse and neglect in children from zero to three years of age. In this improvement project, we proposed to assist practices caring for infants and toddlers to test their use of three (3) bundles (parent, infant, toddler) of tools (*Practicing Safety* toolkit) and to make measurable improvements in care by applying systems-oriented methods that have been shown to accelerate change and improve care for patients. The practices were recruited from the AAP's Quality Improvement Innovation Network (QuIIN), a network of practicing pediatricians and their staff whose mission is to improve care and outcomes for children and families by testing practical tools, measures, and strategies for use in everyday pediatric practice. The qualifying QuIIN participants were expected to test the toolkit in order to improve care for infants, toddlers and their families, in an effort to prevent child abuse and neglect. We used collaborative quality improvement methods to accomplish this by setting specific goals for the improvement of care at the level of the individual patient and the practice and by providing practices with the training, tools, and support to accomplish the changes.

The overall goal of this project was to test the 3 *Practicing Safety* bundles (toolkit) with 9 practicing pediatricians and their staff over 6 months to determine feasibility, as well as make improvements to the bundle set. Guided by the AAP's *Practicing Safety* Project Team, the clinical teams were asked to:

- Test the toolkit to see if it improves assessment/screening and anticipatory guidance by pediatric physicians and staff with parents/caregivers on topics of crying, maternal depression, toilet training, and discipline.
- Test use of the *Practicing Safety* tools for education by pediatric physicians and staff with parents/caregivers on topics of crying, maternal depression, toilet training, and discipline.
- Test the usefulness of the *Practicing Safety* tools and ease of use of the tools; and determine strategies for use of the tools.

Methodology

Practice recruitment

A broad spectrum of nine primary care clinical teams were to be recruited from the membership of the AAP's Quality Improvement Innovation Network (QuIIN) which is

comprised of pediatricians in primary care settings. The goal was to obtain a diverse sample of practices, including practice geographical location, practice setting (urban, rural, suburban), practice size and type of organization. In order to be selected as part of the project, the primary care practice had to see a minimum of 5 newborns per month. Participants were asked to have a willingness and commitment to participate with their practice team and make improvements in the delivery of child abuse and neglect prevention using the *Practicing Safety* bundles. They had to have an interest in sharing lessons learned with other project participants. A broad range of criteria were considered, including previous experience in quality improvement projects. Applicants were expected to have identified a multidisciplinary team of 3 members, comprised of a physician, manager, nurse, and/or administrative or office support staff, and documented in the application the commitment of the lead physician to support this project. All applications received were reviewed by the *Practicing Safety* Project Team and as a result of greater interest in the project a final total of 14, rather than 9, practices were accepted to participate. Once practices were selected to participate in the project, each physician and staff member at the practice was asked to sign a consent form.

Each participating team was expected to:

- Complete Prework activities prior to the Improvement Workshop, including review of the toolkit, completion of a pre-survey (Inventory) and collection of baseline data.
- Collect and submit at baseline and monthly, data through chart reviews and reports.
- Participate in one (1) face-to-face, 1.5 day Improvement Workshop.
- Learn the *Model for Improvement* and implement Plan Do Study Act (PDSA) cycles
- Test innovations in care delivery to prevent child abuse and neglect.
- Share lessons learned and problem-solve with other participating practices through monthly conference calls and e-mail.
- Use e-mail and the Internet on a regular basis for ongoing support, information, and communication among practice teams.
- Complete a post-survey (Inventory) and Tool Evaluation.
- Participate in in-depth telephone interviews at the conclusion of the project
- If owned by a health care institution, seek Institutional Review Board approval for participation

These expectations were clearly communicated to teams prior to enrollment in the project.

Study design

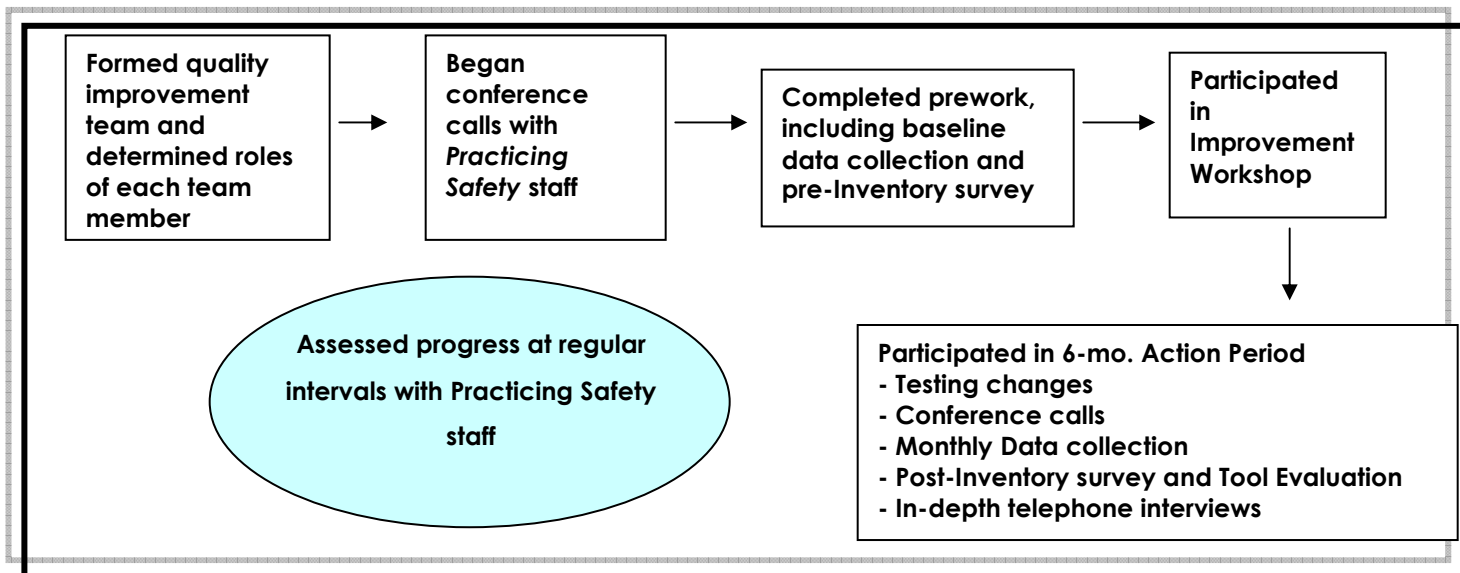
An interrupted time-series design was used. Baseline and repeated measurements of the primary care practices' care processes, using patient chart review, was conducted over six months to track changes in performance of care processes related to assessment/screening, anticipatory guidance and use of resources by pediatric physicians and staff with parents/caregivers on topics of crying, maternal depression, toilet training, and discipline.

Study methods and procedures

During the 7 month project (one pre-work month and six month action/testing period), teams were asked to use a systematic approach to the prevention of child abuse and neglect through the use of improvement science methods, including measurement, a toolkit, consisting of 3 bundles (infant, mother/caregiver and toddler), and a set of suggested strategies. Teams took part in a one and one half day improvement workshop at American Academy of Pediatrics offices in Elk Grove Village, IL and participated in monthly conference calls over the six months to work together with other participants on challenges and successful strategies. Teams also completed a pre- and post-inventory survey and collected monthly, a set of measures through chart reviews and survey tools.

The workshop oriented clinical teams to the *Practicing Safety* toolkit, trained them on data collection methods and project protocol and explained the use of the Model for Improvement for implementing process changes. During the project, measurement of progress and small tests of change with the project’s tools and strategies included in the bundles were required. The sequence of project events for involvement is in the chart below:

Timeline for Participating Practices



After recruitment of practices, the practices were asked to form a team and participate in an orientation conference call facilitated by the project team. Following this initial orientation, baseline data was collected by the clinical teams, to assess their current level of performance with respect to use of anticipatory guidance, assessment/screening and

parental education tools for psychosocial development issues, such as crying, maternal depression, bonding/attachment, discipline and toilet training. They submitted a pre-inventory survey to the *Practicing Safety* project team to assess existing systems and aggregate chart review data.

The *Practicing Safety* project team developed three bundles (infant, mother/caregiver, toddler) of tools (*Practicing Safety* toolkit), measures and data collection instruments and instructions designed to test this toolkit to see if it improved assessment/screening, anticipatory guidance and the use of parental education tools by pediatric physicians and staff with parents/caregivers on the topics of crying, maternal depression, bonding/attachment at the 2-month well-child visit; toilet training, and discipline at the 18-month well-child visit. This toolkit was revised based on the evaluation of pediatric practices involved with the previously conducted *Practicing Safety* feasibility study.

During the project, measurement of progress and small tests of change with various tools and strategies included in the toolkit was required monthly. A Monthly Progress Report was e-mailed to the Quality Improvement (QI) Advisor.

During the six-month testing phase, the clinical teams tested the tools in their settings in a sequential series of *Practicing Safety* team-guided activities designed to help the clinical teams improve care processes regarding their use of anticipatory guidance, assessment/screening and parental education tools for the topics of crying, maternal depression, discipline and toilet training. The *Practicing Safety* team facilitated monthly conference calls with the practice teams. On these calls, clinical teams shared the results of their tests with the project team. Feedback on the tools was captured by the *Practicing Safety* team during the call, as well as obtained through the use of the Monthly Progress Report and a Tool Evaluation which was collected at the endpoint of the six-month testing period. The Project team adapted and revised the toolkit, measures, and data collection instruments based on how useful and effective they were in helping teams achieve measurable improvements in care delivery and the qualitative feedback from the clinical teams.

A simple interrupted time-series design was used to determine the trend over time for clinical care process change among the participating practices. Participating practices were asked to incorporate the use of the Chart Documentation Form into their charting system for infants and toddlers. Monthly chart reviews were conducted by clinical teams for 10 infants at their 2 month visit to the pediatric practice and 10 toddlers at their 18 month visit to the pediatric practice. This data guided the improvement efforts. Only the date of data submission was recorded by each clinical team in order to distinguish pre-improvement care from post-improvement care (e.g., if data was *collected* on July 30, 2009 from charts of patients seen any time during July 2009, then the date of data submission was July 30, 2009). The date of data submission by each clinical team enabled us to know whether the quality of care improved after compared with before improvements.

Data collected through use of the tool described above was reported by fax or e-mailed as scanned files to the QI Advisor, by submitting 20 Chart Documentation Forms monthly, as outlined above. The QI Advisor recorded whether or not the tools related to each bundle were used. Aggregate data about use of anticipatory guidance, assessment/screening and tool usage for each bundle was tallied monthly for each practice by the QI Advisor using the Aggregate Data Collection Tool. The data points for each corresponding measure were then plotted on practice runcharts by the QI Advisor and e-mailed to the AAP team, to be posted on the password protected project website and shared with practice participants and the *Practicing Safety* Team.

As part of the pre-work and again as post-survey, teams were asked to assess existing systems in their practice regarding these psychosocial issues for crying, maternal depression, discipline and toilet training, using a care process Inventory.

At the end of the six month action period, Tool Evaluation surveys were completed by clinical team members and interviews with physicians from each team were also conducted. They were asked to give the project team evaluator additional feedback on the revised toolkit, the usefulness of the tools and ease of use, as well as on the strategies for implementation.

After the completion of the interviews and analysis of data from all of the sources, the project team will make recommendations to revise the toolkit, strategies and measures based on feedback received during the testing and results the clinical teams achieved in improving care processes related to the topics of crying, maternal depression, bonding/attachment, discipline and toilet training.

Results

Practice Profiles

Fourteen practice teams representing 11 states participated in this *Practicing Safety* project. Nine of the teams practiced in an urban setting, three in a rural geographic area and two reported having suburban practices. Of these 14 teams, 10 were single specialty group practices including one academic residency outpatient clinic and one hospital-based clinic; three were defined as multi-specialty group practices, one of which was a hospital-based clinic; and one solo practice had status as a Rural Health Clinic. Practice ownership of this group varied, as well, with seven owned by hospital health systems, four wholly physician owned organizations, two owned by universities and one site publicly (county) sponsored and staffed by medical school faculty. Six of the participating organizations have implemented an electronic health record (EHR) system in their practice, seven are still using paper charts for patient records and one practice reported that they were in the process of transitioning to an EHR.

Regarding the patient populations in these 14 practices, seven reported that they see in the range of 400-999 patients who are ages 0-3 years old on a monthly basis. Two practices reported seeing less than 100 such patients per month, 2 indicated that they see in the range of 100-399 0-3 year olds each month and three practices reported that they see at

least or greater than 1000 patients in that age range on a monthly basis. Twelve these practices reported that 70% or more of their patient population is publicly insured, while two private practices indicated that 67 and 80% of their patients have private insurance. Five participating practices reported that 10% of their patients are uninsured, while one practice reported that 25% of their patients have no insurance. The racial/ethnic make-up of their patient populations also varied, with five of the practices indicating that at least 45% of their patients are Hispanic/Latino, four practices reporting that 45% or more of their population is Black/African American patients, three practices reporting that 45% or more of their patients are White and one practice has a 35% Asian patient population. One practice indicated that 45% of their patients are White and 45% are Black/African American.

Each practice was asked to identify a team of three individuals to serve as their core improvement team for this project. Every team included a lead physician who was also a member of the AAP's Quality Improvement Innovation Network (QuIIN). The remaining two core team members varied by site. Three teams included a second Pediatrician, one core team included a Pediatric Resident, one included their Social Worker and one team was comprised of the lead physician and two medical center administrators. The remaining 8 core improvement teams identified a variety of clinical and/or administrative staff as team members to work with their lead physician.

Of these 14 core improvement teams, four reported as part of the application process that they were "very knowledgeable" about quality improvement methodology and the Model for Improvement, five reported being "knowledgeable" and two rated themselves as "somewhat knowledgeable." Three teams indicated that they were "not knowledgeable" about either quality improvement methods or the model for improvement.

Runchart Analysis

As part of the quality improvement strategy each month practices were asked to use their chart data to determine and measure their implementation of each bundle of tools. Infant, maternal and toddler specific tools and assessments/screenings were measured. Prior to the intervention, practices were also asked to measure their baseline protocols. Below we compare the baseline information collected to the sixth month (final month) of the project to determine whether there were notable differences in assessment, anticipatory guidance and use of the tools in each bundle.

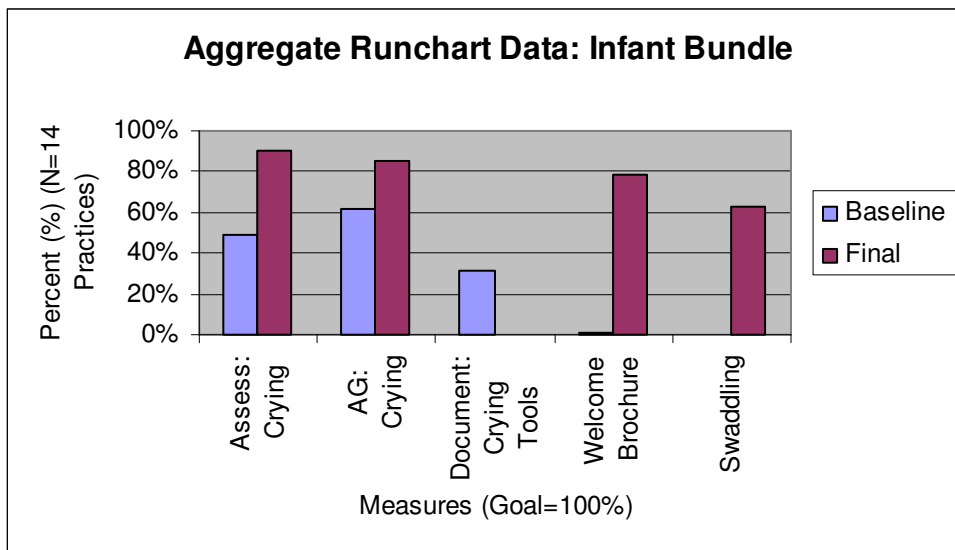
For the baseline we sought to determine if any of the tools that were to be implemented as part of *Practicing Safety* were already being used. Additionally, as a more accurate snapshot of the use of materials we also wanted to know if they were using any other screening/assessment and anticipatory guidance tools (not used by *Practicing Safety*) related to the bundles prior to the onset of the project.

Infant Bundle

Prior to *Practicing Safety* approximately 31% of practices noted that they used and documented tools used that were associated with infant crying. They nearly never used

the brochures about welcoming the newborn or swaddling as suggested by *Practicing Safety*. Among the screening and anticipatory guidance (AG) tools used by these practices were that they assessed crying (49%) and delivered AG about crying (62%). However, at the conclusion of the project, assessment of crying was reported by 90% of practices; this was a 41% increase. AG also increased by 23%; ending with 85% of practices reporting that they were providing more AG on coping with crying. Figure 1 compares the baseline infant bundle to the 6-month follow up for assessment, anticipatory guidance, the use of any tools before the project, and use of two specific brochures of the project.

Figure 1. Aggregate Runchart Data of Infant Bundle tools and screening from baseline compared with project end.

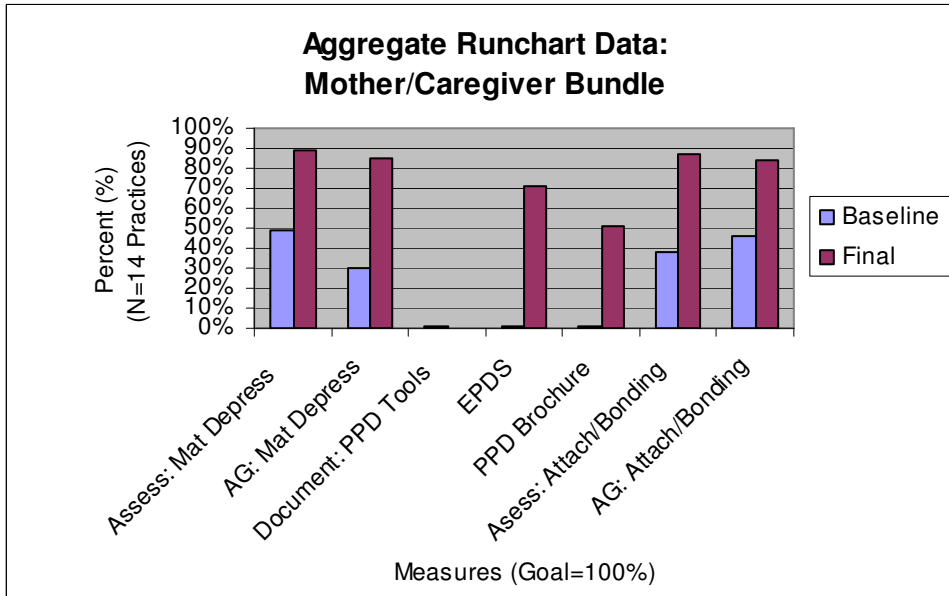


Mother/Caregiver Bundle

Prior to *Practicing Safety* approximately 1% of practices noted that they used any tools and documented the use of these tools that are associated with maternal depression and/or attachment of mother to infant. Approximately half the practices (49%) at baseline reported that they assessed mothers for maternal depression while less than a third (30%) was providing anticipatory guidance to mothers about the risks of maternal depression. Only 1% of practices reported that they used the Edinburgh Postnatal Depression Scale (EPDS) or the maternal depression brochure prior to the *Practicing Safety* project. However, more than a third (38%) of practices reported assessing for attachment or bonding and just under half (46%) provided anticipatory guidance related to attachment or bonding. At the conclusion of the project, assessment for maternal depression was reported by 89% of the practices; this was a 40% increase. Anticipatory guidance (AG) for maternal depression increased by 55%; ending with 85% of practices reporting that they were providing more AG. Additionally, assessment and AG for attachment and bonding increase to 87% and 84% respectively at the conclusion of the project; this is a 49% and 38% increase over baseline reports. Figure 2 compares the baseline mother/caregiver bundle to the final month's data, collected 6 months later, for

assessment, anticipatory guidance, and the use of any tools prior to the project and the two specific brochures.

Figure 2. Aggregate Runchart Data of Mother/Caregiver Bundle of tools and screening from baseline compared with project end.

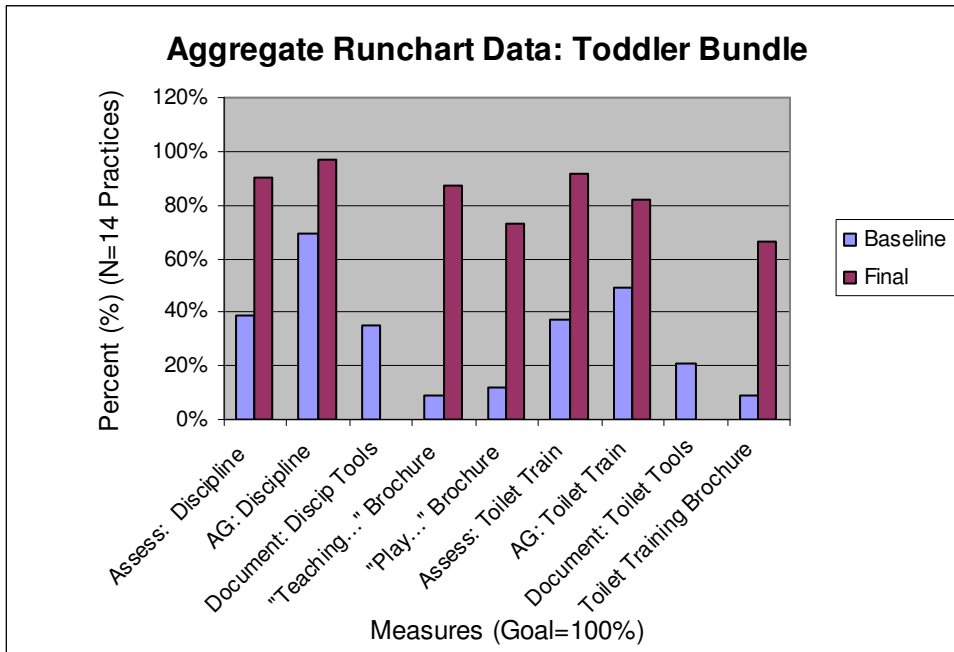


Toddler Bundle

Prior to the implementation of *Practicing Safety* approximately, 35% of the practices noted that they used tools and/or documented the use of these tools associated with toddler issues related to discipline. Approximately, 39% at baseline reported that they assessed mothers for issues related to discipline. And more, 69% were providing anticipatory guidance about discipline. The “Teaching” brochure was reportedly used by 9% of practices at baseline and the “Play” brochure was being used by about 12% of the practices. At the completion of the project over 90% of practices reported assessing and providing anticipatory guidance for discipline (See Figure 3). Practices report high use rates of the discipline focused brochures as well.

Thirty seven percent (37%) of practices reported assessing and 49% providing anticipatory guidance for toilet training prior to implementing *Practicing Safety*. About one fifth (21%) of practices reported that they used or documented the use of any tools related to toilet training prior to the *Practicing Safety* project and 9% report using the Toilet Training Brochure prior to the project. At the completion of the project, toilet training assessment (92%) and anticipatory guidance (82%) increased, as did the use of the Toilet Training Brochure (66%).

Figure 3. Aggregate Runchart Data of Toddler Bundle of tools and screening from baseline compared with project end.



Inventory

The *Practicing Safety* bundles included targeted activities designed to enable the practices to prevent abuse and neglect by implementing the use of PS Practice Guidelines, screening, anticipatory guidance, practice policies and documentation systems to chart these psychosocial activities with children and the families. Below are the results of pre to post intervention comparisons aggregated across the practices.

Table 1 show that the agreement of the clinicians as a group, in each practice, on the use of practice guidelines for assessment increased for all three categories. Practice guideline use for assessment for risk of harm to an infant by noting a parent’s ability or inability to cope with crying increased by 83% post intervention and agreed upon practice guideline use to assess for possible risk to a child by noting parent’s ability or inability to deal with discipline and toilet training increased by 50%. More difficult issues such as assessing parents/caregivers health and well-being by noting risk or signs of depression increased by 30%. However, the practices started out with 77% reporting agreement on practice guideline use for assessment of parents/caregivers and moved to 100% at the end of the project period.

Table 1. Practice guideline use for assessment pre and post intervention.

	Pre-test		Post-test		% Change (Yes resp.)
	% Yes	% No	% Yes	% No	
Practice Guidelines					
Assess risk of harm to infant	46.2	53.9	84.6	15.4	83.3
Assess parent/caregiver health and well-being	76.9	23.1	100.0	0.0	30.0
Assess risk of harm to child	38.5	61.5	92.3	7.7	50.0

Screening/assessment increased for all but one topic, as shown in Table 2. All practices reported screening more than 50% of families prior to the intervention and screening increases ranged from 25 to 57% with the exception of discipline which remained at nearly 70%.

Table 2. Screening of caregivers pre and post intervention.

	Pre-test		Post-test		% Change (Yes resp.)
	% Yes	% No	% Yes	% No	
Screening					
Assessment of caregiver's ability to deal with crying	61.5	38.5	84.6	15.4	37.5
Assessment of caregiver's ability to deal maternal depression	53.9	46.2	84.6	15.4	57.1
Assessment of caregiver's ability to deal with discipline	69.2	30.8	69.2	30.8	0.0
Assessment of caregiver's ability to deal with toilet training	61.5	38.5	76.9	23.1	25.0

Anticipatory guidance increased for each topic area associated with PS bundles. Table 3 shows that anticipatory guidance regarding crying and toilet training were highly performed prior to the intervention (84.6% % for each) yet the effect of the project increased the offering of anticipatory guidance to every family in each of these topic areas by 9%. The largest increase in anticipatory guidance was related to maternal depression where there was a 62% increase.

Table 3. Anticipatory guidance pre and post intervention

	Pre-test		Post-test		% Change (Yes resp.)
	% Yes	% No	% Yes	% No	
Anticipatory Guidance					
Practice offers anticipatory guidance regarding crying	84.6	15.4	92.3	7.7	9.1
Practice offers anticipatory guidance regarding maternal depression	61.5	38.5	100.0	0.0	62.5
Practice offers anticipatory guidance regarding discipline	76.9	23.1	100.0	0.0	30.0
Practice offers anticipatory guidance regarding toilet training	84.6	15.4	92.3	7.7	9.1

Policy development and enactment of the policies, as described in Table 4, showed that this is the area where the most changes occurred from pre to post intervention. Having a policy in place to formally assess coping with crying changed from about one quarter of the time to more than three quarters of the time post intervention. Having a practice policy in place to support screening for maternal depression, along with written and oral information being shared with mothers was also a significant post intervention improvements. Smaller yet significant change was noted in policies to support discussions about crying, discipline and toilet training with parents. While assessment of toilet training was also improved by 25% it was noted that most physicians believe that 18 months is too early for assessment of toilet training and they reported doing it at the 2 year visit.

Table 4. Policies in place in the practices at pre and post intervention

	Pre-test		Post-test		% Change (Yes resp.)
	% Yes	% No	% Yes	% No	
Formally assess crying at/by the 2-month visit	23.1	76.9	76.9	23.1	233.3
Give all parents written information about crying	30.8	69.2	53.9	46.2	75.0
Give all parents oral information about crying	38.5	61.5	46.2	53.9	20.0
Formally screen all mothers for maternal depression	30.8	69.2	69.2	30.8	125.0
Give all mothers written information about	23.1	76.9	53.9	46.2	133.3

maternal depression					
Give all mothers oral information about maternal depression	23.1	76.9	53.9	46.2	133.3
Formally assess discipline at/by the 18-month visit	46.2	53.9	84.6	15.4	83.3
Give all parents written information about discipline	30.8	69.2	69.2	30.8	125.0
Give all parents oral information about discipline	53.9	46.2	69.2	30.8	28.6
Formally assess toilet training at/by the 18-month visit	30.8	69.2	38.5	61.5	25.0
Give all parents written information about toilet training	23.1	76.9	61.5	38.5	166.7
Give all parents oral information about toilet training	53.9	46.2	69.2	30.8	28.6
Documenting plans for addressing identified psychosocial issues	53.9	46.2	84.6	15.4	57.1

Practices were asked to improve their documentation of activities related to the bundles and tools. In Table 5 we see a range of improvements. The most significant change to documentation systems was regarding documenting the presence or absence of parental concerns about crying. Prior to *Practicing Safety* less than 10% of patients were documented as having been assessed for crying. Post intervention we found that nearly 80% of patients were documented as having been assessed. The smallest change noted was in documentation for community resources. Identifying and engaging community-based family support is a difficult issue yet prior to *Practicing Safety* more than 60% of practices documented this effort. Post intervention there was a 12% improvement showing that the use of the bundles was not sufficient to enable practices to learn how to engage community resources.

Table 5. Documentation system improvements from pre to post intervention.

	Pre-test		Post-test		% Change (Yes resp.)
	% Yes	% No	% Yes	% No	
Documentation Systems					
Provide assessment/screening for psychosocial issues	46.2	53.9	84.6	15.4	83.3
Document presence or absence of parental concerns about crying	7.7	92.3	76.9	23.1	900.0
Document mothers at risk or showing signs of depression	61.5	38.5	76.9	23.1	25.0
Document signs of help needed regarding discipline	46.2	53.9	76.9	23.1	66.7

Document signs of help needed regarding toilet training	46.2	53.9	61.5	38.5	33.3
Document possible safety concerns to infant, toddler, or mother/caregiver	69.2	30.8	84.6	15.4	22.2
Make and document referrals to family support and behavioral health services	61.5	38.5	92.3	7.7	50.0
Make and document referrals to Child Protective Services for evaluation and care management	69.2	30.8	92.3	7.7	33.3
Follow up with families who have been referred to other organizations and agencies	61.5	38.5	76.9	23.1	25.0
Post wall signs and brochures in appropriate locations in the practice	53.9	46.2	84.6	15.4	57.1
Participate in a program to encourage family literacy	69.2	30.8	84.6	15.4	22.2
Identify and engage community-based family support and strengthening resources	61.5	38.5	69.2	30.8	12.5

In Table 6, we see very little change in the average number of minutes spent at a 2-month and 18-month well child visit, as reported by 11 of the 14 participating practices who answered these questions in both the pre- and post-inventory questionnaire. Three of the practice teams reported in the post-inventory a decrease in the average number of minutes spent at a 2-month well child, 4 teams reported an increase and 4 practice teams reported that the same average number of minutes spent. Three of these same practice teams reported in the post-inventory a decrease in the average number of minutes spent at an 18-month well child, 2 teams reported an increase and 6 practice teams reported that the same average number of minutes spent.

Table 6. Average Time spent at 2- and 18-month from pre to post intervention

	Pre-test Average (n=11 practices)	Post-test Average (n=11 practices)	Change in minutes (average)
On average, how much time is spent at a 2-month well child visit (in minutes)	19.1 minutes	19.8 minutes	+0.7 minutes
On average, how much time is spent at a 18-month well child visit (in minutes)	21.6 minutes	21.4 minutes	-0.2 minutes

Tool Evaluation Survey

At the conclusion of the project each practice was asked to answer specific questions about the tools in each of the three bundles. The data were collected via Survey Monkey and all 14 practices provided ratings of each specific tool. The responses were coded as Likert indexes and ranged from 1, defined as poor to 5, defined as excellent. Each tool

was assessed for information/content, cultural sensitivity, and usefulness. Within each of those content areas several questions were posed for more precise information.

Table 7 lists the mean ratings of the tools included in the Infant Bundle. The bundle included four tools. The overall mean for each tool showed that practices rated the tools in the bundle between 3.9 (good) and 4.4 (good to excellent) The “Welcome to the World of Parenting” brochure, “Coping with Crying” poster and “Hug, Hold, Comfort, Cuddle” poster were rated 4.3 or 4.4. The lowest rating, still in the above average scoring range, was the “Swaddling 101” guide. The lower scores for that tool show that the literacy level and readability received the lowest rating at 3.5. Additional comments from responders supported this rating by suggesting that the swaddling guide needs to be less wordy, bi/multi-lingual and more graphic, possibly as a poster for demonstration/explanation purposes.

Table 7. Average Respondent Ratings of “Practicing Safety Tool Evaluation: Infant Bundle”

		Swaddling 101	World of Parenting	Coping with Crying	Hug, Hold, Comfort, Cuddle
Information/ Content	Appropriate Information	3.9	4.6	4.3	4.2
	Adequately Comprehensive/ Thorough	4.0	4.4	4.3	4.1
	Aids in Patient Care	3.9	4.5	4.3	4.2
Cultural Sensitivity	Literacy Level is Appropriate	3.5	3.9	4.5	4.4
	Culturally Appropriate	3.8	4.2	4.4	4.4
	Free of Bias	4.5	4.5	4.6	4.6
Usefulness	Readability	3.5	4.1	4.6	4.5
	Relevant Information	3.9	4.2	4.4	4.4
	Purpose is Clear	3.9	4.3	4.4	4.4
	Effective	3.9	4.2	4.3	4.3
	Total (average)	3.9	4.3	4.4	4.3

Key:

1 = Poor

5 = Excellent

Table 8 lists the mean rating of the tools included in the Maternal/Caregiver Bundle. Four diverse tools were included in the bundle from a button that could be worn by physicians and staff in the practice, a poster to display in a waiting or exam room, to maternal depression information and screening tools. The overall mean for each tool showed that practices rated the tools in this bundle between 4.0 and 4.3. Interestingly, the “Have You Read to your Baby Today?” button was rated the lowest in term of information and effectiveness. The post partum brochure was rated the highest overall with an average score of 4.3, although the literacy level was a slight concern, with a lower rating of 3.7. Responders suggested that such a handout should include local resource information and/or the ability to add names and phone numbers of “who to call for help” (i.e., family, friends). The Edinburgh Postnatal Depression Scale (EPDS) tool had an average rating of 4.2 but lower scores regarding literacy level (3.6) and readability (3.9), with responders

commenting that the EPDS was not as well understood by Spanish speaking parents. Additional comments specifically related to tools in this bundle included that the “Read to your Baby...” buttons would only be useful if part of a practice-wide campaign and if available in multiple languages. The Reach Out And Read program was also cited as popular with many of these responders, with long term participation (often >10 yrs).

Table 8. Average Respondent Ratings of “Practicing Safety Tool Evaluation: Mother/Caregiver Bundle”

		Post Partum Depression	Refresh, Renew, Recharge	Edinburgh Postnatal Scale	Read to Baby Button
Information/Content	Appropriate Information	4.5	4.1	4.4	3.4
	Adequately Comprehensive/Thorough	4.3	4.1	4.2	3.4
	Aids in Patient Care	4.5	4.1	4.5	3.4
Cultural Sensitivity	Literacy Level is Appropriate	3.7	4.2	3.6	4.3
	Culturally Appropriate	4.1	4.4	4.1	4.2
	Free of Bias	4.5	4.6	4.3	4.6
Usefulness	Readability	4.1	4.2	3.9	4.1
	Relevant Information	4.2	4.2	4.2	4.2
	Purpose is Clear	4.6	4.2	4.4	4.3
	Effective	4.1	4.1	4.4	3.9
	Total (average)	4.3	4.2	4.2	4.0

Key:
 1 = Poor
 5 = Excellent

Table 9 lists the mean ratings for the tools included in the Toddler Bundle. Three brochures and a “Reading, Routine, Relationships, Rewards” poster all focused on helping parents understand effective discipline and 2 brochures and potty charts with stickers were available to help support toilet training efforts. These seven tools had overall average ratings from 4.2 (Bed Wetting brochure) to 4.7 (Temper Tantrums brochure). There were no ratings within each assessment category of less than a 4.0 (good) for the tools in this bundle. Comments specifically related to the tools in this bundle included that the potty charts were very popular and well-received by parents and that the bedwetting brochure should only be used for older children, especially those with bedwetting problems.

Table 9. Average Respondent Ratings of “Practicing Safety Tool Evaluation: Toddler Bundle”

		Toilet Training	Potty Chart	Bed-Wetting	Teaching Good Behavior	Temper Tantrum	Playing is Learning	Reading, Routine, etc.
Information/Content	Appropriate Information	4.7	4.6	4.2	4.8	4.9	4.7	4.5
	Adequately Comprehensive/Thorough	4.6	4.3	4.2	4.7	4.7	4.6	4.5
	Aids in Patient Care	4.7	4.5	4.1	4.7	4.8	4.5	4.4
Cultural Sensitivity	Literacy Level Appropriate	4.1	4.6	4.3	4.3	4.2	4.4	4.3
	Culturally Appropriate	4.4	4.5	4.4	4.5	4.6	4.6	4.3
	Free of Bias	4.7	4.7	4.6	4.8	4.8	4.7	4.5
Usefulness	Readability	4.5	4.7	4.1	4.6	4.6	4.6	4.5
	Relevant Information	4.7	4.5	4.1	4.7	4.8	4.8	4.4
	Purpose is Clear	4.8	4.8	4.3	4.8	4.8	4.8	4.6
	Effective	4.5	4.6	4.0	4.6	4.7	4.6	4.2
	Total (average)	4.6	4.6	4.2	4.6	4.7	4.6	4.4

Key:

1 = Poor

5 = Excellent

Post In-depth Physician Interview Analysis

At the conclusion of the project in-depth interviews were conducted with lead physicians at each site. Interviews were conducted by phone with an experienced qualitative interviewer and a note taker who was familiar with the project, tools, and processes. Both the interviewer and the note taker took comprehensive notes. Both sets of notes were combined to create one document for review and analysis. Qualitative Analysis was iterative and analyzed by two analysts. We used constant Comparison and Grounded Theory which is widely used and was developed in late 60's by Anselm Strauss. Major and minor themes were detected and the analysts met to compare findings and referee differences in the analyses. We first reviewed individual interview responses. We looked for indicators of categories then named them and coded the themes. We compared codes (from both coders) to find consistencies and differences. Consistencies between codes (similar meanings or pointing to a basic idea) revealed categories. We used copies of interview responses and color coded categories of responses. Eventually category saturation occurred when no new codes related to theme were formed. Certain categories became more of a central focus - axial categories and perhaps even core category (i.e. major and minor themes.) Lastly, a memo on the comparisons and emerging categories or

themes is constructed. These findings were also compared with two other project data sources which included written comments in the Monthly Progress Reports submitted by each team between June and November and comments from participants during monthly conference calls which were captured in notes by project staff. The following is the memo of qualitative findings.

Qualitative themes: In depth post interviews with lead physician

- Consistent use of PS toolkit (screening & AG)
- Systemization of risk
- Changes to chart documentation
- Community resource linkages
- Initiation of meetings
- Improved medical education
- Implementation of QI methodology
- Increased awareness
- Challenges
- Unanticipated positive outcomes

Qualitative major and sub themes were uncovered by the post in-depth interviews with the lead physicians of each practice site. The major themes are as follows. Physicians noted consistent use of PS toolkit (i.e., assessment/screening & anticipatory guidance (AG)). Another major theme was that the practices systemized risk as a result of participation in *Practicing Safety*. Changes to chart documentation occurred at nearly all practices. Community resource linkages were identified and engaged as a result of the project. Physicians also reported an initiation of meetings to discuss PS and to track children identified as having a risk. Another theme that was uncovered was an unanticipated outcome, which was improved medical education. It appeared that the practices implemented the Quality Improvement methodology in their practices. Increased awareness by the majority of physician leaders was articulated in several themes. The interviews also identified challenges and unanticipated positive outcomes

In terms of the consistent use of *Practicing Safety* toolkit (i.e., assessment/screening and anticipatory guidance) a number of examples were provided during the interviews and these indicate sub themes for the major theme. For instance, the practices use of Practice Guides helped to standardize assessments. Another example showed that the PS bundles were easily un-bundled to meet practice needs and they were able to integrate tools within multiple well-child visits beyond the project expectations. Physicians also noted that the toolkit helped to formalize a system for assessments and use of anticipatory guidance. Another example of tailored use of the toolkit was the routine post partum depression screening being done at both the 2 week visit and the 2 month visits. The physicians also noted that PS added a new focus on prevention (i.e. assessment and screening) that they had not had in the practice prior to participation in the project. Lastly, they noted that it added structure and improved organization to their practice.

Physicians identified how *Practicing Safety* helped them to systemize risk levels and several sub themes were identified. Examples included the establishment of a system for defining & identifying risks through the use of the Practice Guide and documentation tools which used a “green-yellow-red light” format. It also helped them to stratify risks. They found that the bundles and tools were appropriate for level of risk and the categories of risk when used with the children and their families. The practice teams reported being familiar with the “traffic light” format of the documentation tools, as they also use it for asthma treatment/action plans that are shared with parents and schools. The monthly report data supported these findings. In June, on a scale of 1-5, where 5 means “strongly agree,” practice teams reported an average score of 4.1 regarding “comfort with differentiating green light from yellow light.” This value increased to an average of 4.4 by November. Likewise, regarding “comfort differentiating yellow light from red light,” practice team averages increased from 3.9 to 4.3 between June and November of their testing period. The average rating related to the “effectiveness of green light, yellow light, red light in helping to care manage the patient” decreased from 3.9 to 3.7 during that same reporting period. Several practices used the stratification as presented but collapsed the “green” and “yellow” assessment and AG for primary prevention for all families with children in the targeted age ranges. Lastly, the academic centers felt that they were “already good at identifying risks...having a full time social worker...” but reported they enhanced care by using *Practicing Safety*.”

The majority of the practices made changes to chart documentation and a few sub themes were identified to further articulate the major theme. This held true for those with either electronic medical records (EMR) or paper charts. Those practices that were unable to make changes to their EMR during the project still identified this as necessary and desirable chart documentation enhancements. Some examples of documentation changes included practices who adapted their EMR templates to test bundles, added *Practicing Safety* issues as prompts in the problem list in their EMR, incorporated the depression screen into their EMR, and/or otherwise formalized a way to document such topics as crying, postpartum depression and bonding assessment at the 2 month visit, with discipline and toilet training topics documented at the toddler well-visits.

All practices enhanced their community resource linkages for *Practicing Safety* issues and a number of sub themes were noted. If the practices had access to social workers they reported an increased connection to that clinic social worker. They reported increased referrals to mental health resources. They found that they needed improved mental health system access to support the assessed mothers who screened at risk for maternal depression previously not identified. They also reported improved use of existing community agencies and organizations as a result of their increased identification and increased outreach to already known but previously little used community resources. Lastly, they noted that the community resource guide was primarily maintained by social worker or a nurse/care coordinator in their organization.

We sought to understand the role of meetings in the project and found that informal meetings was initiated and held regularly to keep track of children identified at the “yellow” or “red” risk levels. *Practicing Safety* was incorporated into meeting agendas

and these physicians reported that they plan to continue to meet at the conclusion of the project. Also, there are practices that have monthly formal meetings or monthly QI meetings to discuss data collection and the test of changes. Interestingly, the physicians generally reported no need to increase time to incorporate PS into their meeting agenda.

The physicians were asked about the implementation of Quality Improvement (QI) methodology with their practice team. They reported the usefulness of the Model for Improvement (MFI) to test change and also reported that the tested changes increased spread beyond the core team to other physicians and staff. Systematic chart reviews are now done monthly. Physicians reported that now PDSA (Plan-Do-Study-Act) cycles are run “organically.” One provider tested changes to his EMR and sought feedback from patients, made changes based on both patient and staff feedback and then expanded testing

Physicians reported that *Practicing Safety* provided an opportunity for enhanced medical and clinician education to physicians, nurses, nursing students and residents. They reported that PS was useful as a professional education toolkit. One example was that PS was implemented in continuity clinics with all residents. It was also noted that PS was used as teaching tool for providers and parents. The posters were prompts for both parents and physicians. And overall it was reported that PS raised awareness of other issues outside PS.

Physicians believe that you can not underestimate the importance of *Practicing Safety* in increasing awareness. They reported raised awareness of postpartum depression, the availability of community resources for referrals, and the need for physician follow-up. It also raised awareness of all roles in the pediatric office. Physicians believe that it also increased nurses’ awareness of the well-being of moms. And importantly they believe it raised awareness of additional needs for “red” or at risk families. Lastly, it was noted that it raised awareness of the recognition of the impact of parents’ mental health on the safety of a child, an issue that was not as clearly understood prior to PS.

Challenges and limitations of *Practicing Safety* were also noted. Specifically, the physicians would like and feel a need for ongoing guidance and support from the lead physician; this they deem as necessary. Issues related to payment codes and reimbursement issues for this expanded care were identified as challenges, too. There is a need for multi-lingual, low literacy, and more graphic materials. Both administrative and clinical competing priorities were noted such as EMR implementation and H1N1. Several physicians noted that practices must have an engaged practice champion. And lastly two other challenges were noted, how to promote the bigger picture to all in the practice and buy-in of physicians.

A number of unanticipated positive outcomes were identified in the physician interview analysis. It is important to note that physicians felt the *Practicing Safety* increased confidence in families and professionals alike. PS made discussions with parents easier and more comfortable for parents to hear. A number of physicians said that this was “a great experience”, “worthwhile learning experience”, “beneficial, and fun to do.” They also noted that it created a bonding of staff toward the project goal. Another unanticipated

outcome is that PS helps establish a medical home. Physicians noted improved communication and relationships between various professions within the practice, with other departments (social work, ob/gin., psychologists, etc.) and parents. Physicians also explained that project facilitation, the learning session, and the monthly calls all supported the work within and among teams. One physician commented at the end of the project, “Its not over, it’s just beginning...”

Discussion

The project’s success began with an overwhelming response to recruitment; we sought to recruit 9 practices and 14 practices enthusiastically asked to participate. Practices were recruited from throughout the country and varied in type, geography and size. The issues raised by *Practicing Safety* were important to these varied practices. The practices had a generalized knowledge of quality improvement that may have helped to prepare them for their success in the project.

In summary, the overall goal of this project was to test the 3 *Practicing Safety* bundles (toolkit) with practicing pediatricians and their staff. The clinical teams participating in this project were asked to test the following three aims, to:

- Test the toolkit to see if it improved assessment/screening and anticipatory guidance by pediatric physicians and staff with parents/caregivers on topics of crying, maternal depression, toilet training, and discipline.
- Test use of the *Practicing Safety* tools for education by pediatric physicians and staff with parents/caregivers on topics of crying, maternal depression, toilet training, and discipline.
- Test the usefulness of the *Practicing Safety* tools and ease of use of the tools; and determine strategies for use of the tools.

Baseline rates of tools, screening and anticipatory guidance showed that practices were attempting to address issues of infant crying, maternal depression and attachment, and toddler issues of toilet training and discipline. But little to no chart documentation of these practices was occurring. At the completion of project significant increases in each of these areas were noted. Additionally, practices used their chart data to determine the rates of tool use, screening and anticipatory guidance. Rates showed that *Practicing Safety* impacted the care provided for these very important psychosocial issues. Additionally, physicians found that they can use their chart data to reflect on their practice. The data then has the potential to provide meaningful feedback to show physicians how their attempts at practice change affects their patients’ care.

As evidenced by the Inventory results, the *Practicing Safety* bundles that targeted the use of practice guidelines, screening/assessment, anticipatory guidance, practice policies and the documentation to chart these psychosocial activities showed great improvement at the

end of the intervention. Activities related to the infant crying and maternal depression showed the most practice change.

The tool evaluation conducted at the conclusion of the project showed that the tools provided excellent to good information and content. Cultural sensitivity was also highly rated as was the usefulness of the tools to the practices. The favorability of these tools is not surprising to the project team. The tools selected for this project were those highly rated from our earlier feasibility study that showed that these specific tools were used more than 75% of the time by pediatricians and their staff in the earlier study. Future applications of these three bundles indicate promising results of physician and staff use of these tools.

The major themes and sub themes detected by the post-indepth physician interviews show that *Practicing Safety* and the quality improvement process were adopted successfully and physicians believed it improved the quality of care. The intent of the study was to test the PS bundles and obtain information about the specific tools and the stratified levels of risk. The qualitative interviews with lead physicians showed that the tools were highly valued and added more value than anticipated. The project, although not specifically designed to create linkages with other departments and agencies and organization outside the practices, did help practices initiate or enhance the referral processes to mental health and parenting organizations. The challenges that were identified were ecological rather than project specific as physicians noted that reimbursement issues remain key to improving prevention. However, the challenges were not primary areas of concern to the physicians interviewed. PS raised awareness, changed practice, created ways for practices to use their chart documentation as feedback data, and opened lines of communication with staff and parents for a united goal.

Conclusions/Lessons Learned

An unanticipated outcome was the greater response to the recruitment “call” because more pediatric practices identified with the clinical need to enhance their ability to address these identified topics as part of well-child care.

These psycho-social issues are a significant concern of parents. Thus, we learned that they are an issue of clinical concern for the practice teams although they did not have the tools and methods to routinely address and document these issues.

This project provided practices with both the tools and strategies that enabled them to address these topics as part of well-child care. Each bundle allowed the practices to tailor the tools as needed to fit their patient population. For instance, practices used tools for more than the project prescribed well-child visit based on age.

We learned that *Practicing Safety* – its tools and strategies can inform more successful implementation of enhanced care such as Bright Futures. Several practices reported, unprompted, that PS is more easily adapted to pediatric primary care than Bright Futures. This we believe is the logical end-point of PS’s philosophy to tailoring practice change

efforts to the unique culture and environment of each practice. The PS project team's implementation strategy is built on the theoretical foundation of Complex Adaptive Systems; this offers a unique perspective to practice change and quality improvement.

This project taught the practice teams to go outside their practice to identify and link with community resources or to increase communication with their Social Worker, if such personnel are part of their organization. Nearly all practices were successful in linking with their community resources. Two of the 14 practices noted that they had difficulty identifying community resources or successfully engaging their community-based organizations. Community resource linkage processes were identified from the qualitative methods and found that practices fell into three distinct patterns of linking with community resources. University and hospital practices included social work services that helped practices with family linkage to community resources. These relationships strengthened during the project and practices reported few barriers to community support services. The second pattern identified was that of independent practices with previous community linkages. These practices noted that PS strengthened and deepened these community connections for referrals related to PS issues. Lastly, practices that were unaware of community resources, and thus more isolated in their practices had less success with identifying resources for patients and families identifies as being at risk. These practices need enhanced support in quality improvement efforts with child maltreatment prevention to enable them to successfully link to referral services.

Little is known from our study as to the practices need to refer families to child protective services. For one our study directed practices to use the tools with 10 patient-families per month and thus may not have encountered children at extreme risk. Secondly, qualitative data showed that children and families at risk were turned over to social workers and the practices may not know the outcome during the short study period. In at least one case a mother was identified by the pediatric practice through maternal depression screening as being extremely depressed and with several young children to care for and the practice was responsible for helping her to enter the hospital for care and obtaining support services.

Diffusion was not a focus of this project. However, an unanticipated outcome was the diffusion of the PS bundles and tools into resident and nursing education as noted by several practices.

At the conclusion of the project, another unanticipated outcome noted was the practices' interest and inquiry as to how best to diffuse the *Practicing Safety* bundles throughout their practices. Since the focus of this project was on testing the tools, diffusion strategies were not included in this initiative. An understanding of the diffusion theory and the use of complex adaptive processes to further support such diffusion are important areas to explore for future research.