



Implementing a Developmental Screening Tool in Pediatric Primary Care Practice

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IMPLEMENTING A DEVELOPMENTAL SCREENING TOOL IN PEDIATRIC
PRIMARY CARE PRACTICE

by

Mina Kay Petrosino

A DNP Project Submitted to the Faculty of the

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As members of the DNP Project Committee, we certify that we have read the DNP Project prepared by Mina Kay Petrosino entitled “Implementing a Developmental Screening Tool in Pediatric Primary Care Practice” and recommend that it be accepted as fulfilling the DNP Project requirement for the Degree of Doctor of Nursing Practice.

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Final approval and acceptance of this DNP Project is contingent upon the candidate’s submission of the final copies of the DNP Project to the Graduate College.

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STATEMENT BY AUTHOR

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SIGNED: Mina Kay Petrosino

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DEDICATION

To my husband Tony, who has always been my strongest supporter and loudest cheerleader in my doctoral path. Even at the hardest times, when I was sure I should quit, you always found a way to motivate me to keep moving.

To my beautiful, intelligent, and witty daughter Stella, you are part of the reason I started this journey and the reason I strive to be better and do better.

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ABSTRACT

The American Academy of Pediatrics (AAP) released a statement recommending that primary care providers perform developmental screening with a standardized instrument for all 9-, 18-, 24-, or 30-month well-child visits. Despite evidence-based recommendations by the AAP, numerous pediatric practices do not currently use a standardized instrument for well-child visits.

This quality improvement project aimed to determine the feasibility of implementing the Ages and Stages Questionnaire (ASQ), a validated developmental screening tool, at a pediatric primary care practice. In order to accurately assess implementation barriers and benefits, this feasibility study would have determined if the ASQ was the right fit for this pediatric practice. The first phase of implementation would have begun with the 9-month well-child visits and using the same process, later expanded to include the 18- and 24-month visits. The Plan-Do-Study-Act (PDSA) method would have provided the implementation framework for this project and the project would have been written utilizing the SQUIRE (Standards for Quality Improvement Reporting Excellence) guidelines. However, due to unforeseen complications, this project was unable to be completed as planned. Instead, this project discusses outcomes of the DNP project without data, and provides guidance and points of consideration for future implementation in pediatric primary care settings.

CHAPTER 1: INTRODUCTION

Background Knowledge

In the United States about one in six, or about 15%, of children have one or more developmental disabilities (Centers for Disease Control and Prevention [CDC], 2013). Nearly half of these children will not be identified before they enter kindergarten (Mackrides & Ryherd, 2011). Over the last 12 years, the prevalence of developmental disabilities has increased 17.1%; which translates to about 1.8 million more children with developmental disabilities now as compared to a decade ago (Boyle et al., 2011). The Centers for Disease Control and Prevention (CDC, 2013) define developmental disabilities as “a group of conditions due to impairment in physical, learning, language, or behavior areas” (para. 1). These conditions often begin in childhood, impact day-to-day functioning, and typically last throughout a person’s lifetime (CDC, 2013). Developmental disability may be solely physical, such as visual impairment, or may involve physical and intellectual disability. It is believed to be caused by a complex mix of factors including genetics, parental behaviors (such as smoking and drinking during pregnancy), complications during birth, infections during pregnancy or early life, and exposure to environmental toxins, such as lead (CDC, 2013). Table 1 lists examples of specific developmental disabilities.

Children with developmental disabilities have special health care needs, and their care requires management similar to children with other chronic conditions (Centers for Disease Control and Prevention [CDC], 2011). Accurate identification of a developmental disability and understanding its causes is essential for treatment planning, from medical treatment and intervention services for the child to genetic counseling for the parents. Furthermore, early detection and intervention provide lifelong benefit and improve long-term academic and

behavioral outcomes (Sices, Stancin, Kirchner, & Bauchner, 2009). Children who receive early intervention are more likely to complete secondary education, maintain a job, live independently, and avoid teen pregnancy and criminality (Glascoe, 2000; Limbos & Joyce, 2011). Additionally, these children are less likely to incur higher future costs related to development-related treatment as well as health problems, and use of the welfare system (Limbos & Joyce, 2011). These positive outcomes of early intervention depend heavily on early detection of children with disabilities.

TABLE 1. *Examples of Developmental Disabilities*

• Attention-Deficit/Hyperactivity Disorder	• Hearing Loss
• Autism Spectrum Disorders	• Intellectual Disability
• Cerebral Palsy	• Kernicterus
• Down Syndrome	• Muscular Dystrophy
• Fetal Alcohol Spectrum Disorders	• Tourette Syndrome
• Fragile X Syndrome	• Vision Impairment

Note. Examples derived from Centers for Disease Control and Prevention (2013).

In the U.S. almost 95% of children between birth and three years of age report a regular source of healthcare (Sand et al., 2005). Most families with preschool age children routinely access primary care clinicians for well-child care as well as common health services such as vaccinations and yearly examinations (Limbos & Joyce, 2011). Since primary care pediatric clinicians, including Nurse Practitioners, have frequent contact with infants and young children during critical times in their early development, they are well suited for the detection of developmental disabilities in children. This frequent longitudinal contact, unique to primary care, provides clinicians with important opportunities to conduct screening to detect developmental disabilities and initiate early intervention.

Developmental surveillance and developmental screening are terms often utilized in discussion of developmental disabilities. Developmental surveillance is a process of recognizing children at risk for developmental delay (CDC, 2011). Developmental delay is slowed or impaired development in a child who is under five years of age and is at risk of having a developmental disability (Developmental Disabilities Resource Center, 2014). If a child is judged to be at risk for developmental delay, they should be referred for comprehensive developmental and medical evaluations, and possible early-intervention services (King et al., 2010). Developmental surveillance emphasizes monitoring development over time within the context of a child's overall well-being, not just viewing development during isolated testing sessions or visits (Berry, Garzon & Deloian, 2013).

Developmental screening is defined as the “use of standardized tools to identify and refine the risk of developmental delay” (Guevara et al., 2013, p. 31) and helps to identify potential and actual developmental concerns in an individual (Berry et al., 2013). Developmental screening tools identify a child's area of development that falls outside the normal limits, thus requiring a referral for more in-depth developmental assessment (Berry et al., 2013).

In 2006, the American Academy of Pediatrics (AAP) released a policy statement on developmental surveillance and screening for children from birth to three years of age (King et al., 2010). This statement recommended primary care providers perform both developmental surveillance at all well-child visits, and developmental screening with a standardized instrument at 9-, 18-, 24-, or 30- month well visits (King et al., 2010; Radecki, Sand-Loud, O'Connor, Sharp, & Olson, 2011). Additionally, the Children's Health Insurance Program Reauthorization Act (CHIPRA) published an initial core set of children's health care quality measures for Medicaid and the Children's Health Insurance Program (CHIP). These quality measures

recommended developmental screening in the first three years of life using a standardized screening tool (Radecki et al., 2011).

Despite these recommendations regarding developmental screening, there continues to be a disparity between guidelines and actual practice. A majority of clinicians do not perform routine screening using a standardized tool, resulting in children with developmental disability not being identified until they reach school age, thus resulting in delayed critical early treatment (Limbos & Joyce, 2011). There are numerous contributing factors to the lack of screening by clinicians including inadequate time for screening, conflicting accuracy reports on available screening tools, and lack of research on these tools in primary care settings (Limbos & Joyce, 2011). In a 2004 national survey of primary care practitioners, barriers cited included lack of staff to perform screening, inadequate reimbursement, and lack of confidence in their ability to screen (Radecki et al., 2011).

Additionally, stakeholders play a role between developmental screening tool guidelines and implementation in practice. Stakeholders are defined as individuals and organizations that participate in a specific activity because they produce, consume, manage, regulate or evaluate the activity (Hyder et al., 2010). Support from stakeholders is a key to implementing a standardized developmental screening tool if one is not already being used. Stakeholders influence adoption of a proposed innovation and their support is necessary for successful implementation (Titler, 2010). In healthcare, key stakeholders include: physicians and other care givers, patients, organizations, innovator companies, and regulatory agencies (Omachonu & Einspurch, 2010). To ensure success, a proposed innovation, such as implementing a developmental screening tool, should account for each stakeholder's unique set of needs, wants, and expectations (Omachonu

& Einspurch, 2010). Table 2 lists examples of needs, wants, and expectations of each stakeholder in healthcare.

TABLE 2. *Stakeholder Needs, Wants, and Expectations*

Stakeholder	Needs, Wants & Expectations
Physicians & Other Caregivers	Improved clinical outcomes, diagnosis, and treatment
Patients	Improved patient experience & physiological well-being, reduced wait time and delay
Organizations	Enhanced efficiency, cost containment, increased/improved productivity, quality and outcomes
Innovator Companies	Improved outcomes, profitability
Regulatory Agencies	Improved patient safety, reduced risk

Note: Derived from Omachonu & Einspurch, 2010.

Understanding perspectives of various stakeholders can provide numerous advantages. First, understanding views of key decision makers can provide insight into the likelihood policy changes needed for the intervention will occur (Hyder et al., 2010). Second, consumer ideas, expectations, and concerns regarding the intervention can help predict the likelihood of successful implementation (Hyder et al., 2010). Additionally, with multiple stakeholder perspectives refinement of an intervention by incorporating innovative ideas can occur (Hyder et al., 2010). Lastly, allowing the sharing of stakeholder perspectives can build solidarity and garner support for a particular intervention (Hyder et al., 2010).

A significant increase in the number of standardized screening tools have been made available as well as the adoption of these tools by pediatricians in the last decade. From 2002 to 2009, the percentage of clinicians using ≥ 1 -standardized tool has doubled from 23% to 47.7% (Radecki et al., 2011). A large number of developmental screening tools are available and differ

in respect to their purpose and method of administration. Tools may be for general screening or screening for specific problems (i.e., autism spectrum disorder). The administration method for screening tools can vary from parent-report to practitioner-administered, or a combination of both.

The use of specific instruments has increased over the past decade, with significantly more pediatricians using the Ages and Stages Questionnaire (ASQ) and the Parents' Evaluation of Developmental Status (PEDS) in 2009 than 2002 (Radecki et al., 2011). In 2002, only 7.3% of pediatricians reported always or almost always using the ASQ for developmental screening. This percentage increased to 22.4% in 2009. Similarly there was an increase in PEDS usage from 2.4% to 15.9% in 2002 and 2009, respectively. These tools represented the biggest increase in usage from 2002 to 2009 versus other developmental screening tools such as Bayley Infant Neurodevelopmental Screener (BINS) or Denver Developmental Screening Test II (DDST-II; Radecki et al., 2011).

Both the ASQ and PEDS are parent report measures for screening for general developmental delay (Drotar, Stancin, Dworkin, Sices, & Wood, 2008). Popularity of these tools is due to several favorable qualities including being parent-completed, the ease of administration and interpretation, and low cost, making it affordable for frequent use (Limbos & Joyce, 2011). Parents are reliable sources for information regarding a child's development (CDC, 2011), and utilizing evidence-based screening tools that incorporate parent reports can help identify those at risk of developmental disability. Additionally, these parental report instruments mean clinicians do not need to administer the instrument during the patient visit, potentially saving time, which is an often-reported barrier to using such instruments.

The ASQ and PEDS are both recommended for use in the general primary care population, however the ASQ is also recommended in broad high-risk prematurity (Drotar et al., 2008). Both instruments have published validation studies and have been validated in large, diverse standardization samples (Drotar et al., 2008). However, the ASQ has superior sensitivity and specificity in comparison to the PEDS. The PEDS had moderate sensitivity (74%) but low specificity (64%), while the ASQ had moderate sensitivity and specificity (78% and 75%, respectively) (Limbos & Joyce, 2011). The ASQ is also reported as the most frequently used formal screening tool by pediatricians (Radecki et al., 2011).

Local Problem

During my pediatric nurse practitioner student rotation, I identified a pediatric practice that did not follow the AAP's recommendations regarding use of a developmental screening tool. Despite evidenced based recommendations by the AAP, a well-validated developmental screening tool was not being utilized for the 9-, 18-, or 24-month well-child visits. Although developmental surveillance was performed at every well-child visit, and documented in the patients' electronic health record (EHR), the process of this assessment was informal without a standardized tool and process, as recommended by the AAP. The developmental surveillance questions were an informal checklist embedded within the EHR for providers to document against, assessing areas including fine motor, gross motor, personal-social, and language skills. Table 3 lists the definitions of each of the development areas that should be assessed during well child visits whether through provider assessments or using standardized tools.

TABLE 3 *Developmental Areas Defined*

Development Area	Definition
Communication	Babbling, vocalizing, listening, and understanding.
Gross Motor	Movement involving balance, coordination, and large muscle activity. Arm, body, and leg movements.
Fine Motor	Use of small muscle groups for controlled movements. Hand and finger movements.
Problem Solving	Learning and playing with toys.
Personal-Social	Solitary social play, play with toys, and interaction with other children

Note. Definitions derived from Developmental Disabilities Resource Center (2014) and Squires et al. (2009).

In this practice, non-standardized informal questions derived from the DDST-II were used to assess these developmental areas. However, responses were not scored using a standardized process, risking a gap in practice in identification of children at risk for developmental delay. Lack of standardization may result in errors with some areas of development being missed or misdiagnosed. Furthermore, specificity of the DDST-II ranges from 43 - 80% and sensitivity from 56 - 83% based on scoring method, neither method producing acceptable levels of accuracy (Glascoe et al., 1992). Thus, the providers at this practice are not using the most reliable and valid instrument for assessing developmental disabilities.

During discussions with the Clinical Chief of Pediatrics (major stakeholder), who also identified this gap in quality, we discussed the risks and benefits of implementing a screening tool. I identified one strength of a DNP education was that I could conduct a quality improvement project to determine feasibility of screening using a reliable and valid tool to improve practice and health outcomes for patients. Concerns by the Clinical Chief were that

implementing such a tool would be too time consuming and interrupt clinic workflow. In order to accurately assess implementation barriers and benefits, I proposed a feasibility study to determine if the ASQ was the right fit for this pediatric practice.

Setting

The practice I selected to conduct my quality improvement project was a community pediatric physicians group. This particular pediatric group employed 10 physicians, each with their own administrative assistant and registered nurse. There was also one physician assistant who provided lactation consults. There are plans to expand providers to include Nurse Practitioners. Since the NP role at this practice would include well-child visits, it would be best practice to have a validated tool in place to screen for developmental disabilities.

Intended Improvement: Purpose

The primary aim of this quality improvement project was to determine if it is feasible to implement the ASQ for all 9-, 18-, and 24-month well-child visits at a pediatric physician practice. As originally proposed, the first phase of implementation was to begin with the 9-month well-child visits and using the same process, to later expand to include the 18- and 24-month visits. The overall objective of implementation was to use a standardized assessment to provide early detection and intervention for children with developmental disability, thus initiating treatment early to improve pediatric patients' long-term academic and behavioral outcomes.

Study Questions

The project was designed to answer the following questions:

1. Is it feasible to implement the ASQ at this pediatric practice?
2. Do parents believe the ASQ is beneficial in identifying developmental disability?

3. How do the provider, administrative assistant, and nurse involved in implementation believe or perceive that the ASQ affected workflow?
4. What do the provider, administrative assistant, and nurse involved in implementation believe are the strengths and limitations of using the ASQ?

CHAPTER 2: METHODS

Framework

PDSA

Implementing change into an established healthcare practice is challenging. The Plan-Do-Study-Act (PDSA) method provided the implementation framework for this quality improvement project. See Figure 1 for the PDSA model. PDSA has been documented and successfully used in quality improvement projects internationally (Kong & Kong, 2013). The PDSA method guides the test of a change by utilizing ongoing cycles of small changes and continual reassessment (Institute for Healthcare Improvement [IHI], 2014a). It was designed to test and implement change in real work settings (Marcellus, Harrison, & MacKinnon, 2012) and determine if the intended change leads to improvement (IHI, 2014a). This framework also allows for testing of an idea on a small scale before implementing change on a larger scale (Kong & Kong, 2013). The philosophy behind the PDSA model is that the most effective way to change health care processes and outcomes is to test change on a small scale, learn from it, and make further changes, creating a cumulative effect of change and improvement (Marcellus et al., 2012).

The PDSA cycle consists of four steps: *plan*, *do*, *study*, *act*. For this project, one cycle of the PDSA will be conducted. The *plan* step includes stating the objective of the test and developing a plan to test the change (IHI, 2014b). Every objective or goal will require many smaller tests of change. The next step, *do*, involves implementing the small-scale test and collecting data on the question identified (IHI, 2014b). The *study* step is where data is analyzed and compared to predictions (IHI, 2014b). In the final step, *act*, modifications are made based on what was learned from the test and a plan for the next cycle is prepared.



FIGURE 1. PDSA Model

SQUIRE

This quality improvement project was written utilizing the SQUIRE (Standards for Quality Improvement Reporting Excellence) guidelines. SQUIRE is a set of guidelines aimed to help authors write articles about quality improvement in healthcare. The guidelines provide a framework to share knowledge gained from a quality improvement project, examining the intervention closely and in detail (Ogrinc et al., 2008). SQUIRE can and should be applied to reports of interventions that are designed to “improve clinical outcomes by delivering clinically proven care measures more appropriately, effectively, and efficiently” (Davidoff, Batalden, Stevens, Ogrinc & Mooney, 2008, p. 673).

Nursing journals (e.g., American Journal of Nursing, Journal of Nursing Care Quality, and Pediatrics-American Academy of Pediatrics) support the use of SQUIRE guidelines for

quality reporting (SQUIRE, n.d.). Quality improvement work has unique properties and its design, types of interventions; data collection and analysis often do not fit under existing publication guidelines (Ogrinc et al., 2008). SQUIRE guidelines provide a clear and accurate reporting method for quality improvement work (Ogrinc et al., 2008). Here, I use the 19-item SQUIRE checklist to guide the creation of the project document. Many of the items are similar to other scientific reporting methods, but nearly all of them have been modified to reflect the uniqueness of medical improvement work (Ogrinc et al., 2008).

The following paragraphs outline the process that should be followed when using the PDSA cycle, a method of quality improvement. Although the project was not completed as planned, this section outlines the process that was later approved by the Institutional Review Board.

Planning the Intervention

To test the feasibility of using the ASQ at a pediatric physicians practice, during the initial PDSA cycle approximately 10 patients and one physician provider were to have been recruited. Figure 2 shows the sequence of data collection.

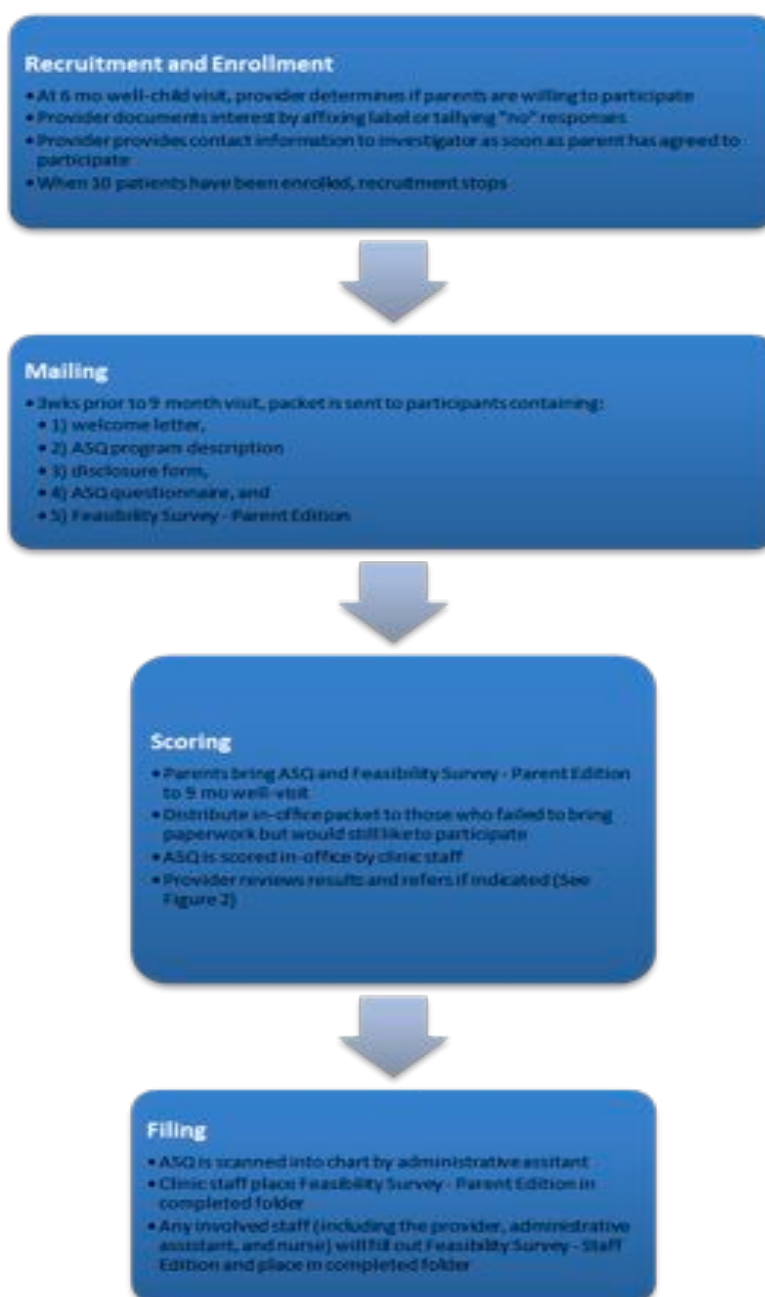


FIGURE 2. Data Collection Sequence to Determine Feasibility of Implementing the ASQ.

The patient sample was to have consisted of parents/guardians of infants (minimum of 10) seen for 9-month well-child visits. The number of patients was selected after consultation with the Chief of Pediatrics. In addition, because only one cycle of the PDSA was going to be implemented for this project, 10 parents/guardians were considered sufficient to obtain initial

feasibility data. Other inclusion criteria included: parent/guardian must be English speaking; child must be a current patient of the practice and have no diagnosed developmental disability. As part of the plan phase of any quality improvement project, how recruitment would occur was discussed with the provider at the clinic. Based on discussions with the provider, the recruitment of the sample population should begin at the 6 month well-child visit with the provider asking the parent if he/she would be willing to participate in the quality improvement project during the 9-month well-child visit. The provider would distribute a brief introductory letter to the parents (Appendix A) and a description of the ASQ program (Appendix D) to determine their willingness to participate.

If a parent/guardian stated they were willing to participate, a patient label with contact information would be affixed to the form (Appendix B). Later, the patient label would be randomly assigned to a new identification number consistent with an alphanumeric code process that would protect the patient's privacy and served as the patient's identifier on all study related materials, except the 9-month ASQ questionnaire. Since the answers to the ASQ questionnaire were not being used in data analysis, and the ASQ was to have been scanned into the patient's medical record, a random patient identifier was not used. The provider was to have kept count of parents or caregivers that did not wish to participate. This would have provided data on the number of parents/guardian unwilling to participate versus how many were willing to participate as an indication of feasibility.

Three weeks prior to the child's scheduled 9-month well-visit, participants would have been sent via regular mail: 1) a welcome letter; 2) a description of the ASQ program; 3) a disclosure form; 4) a 9-month ASQ questionnaire; and, 5) a Feasibility Survey – Parent Edition. Each of the items in the mailing, except the ASQ questionnaire, would have been labeled with

the random patient identifier that was previously assigned to that patient. The University of Arizona Institutional Review Board (IRB) and pediatric clinic group approved all materials (Appendices A-I).

- 1) The welcome letter provided a description of the study including estimated time for completion, risks and benefits (Appendix C). It also discussed patient confidentiality and described the amount of participation expected from the parent.
- 2) The program description handout (Appendix D) provided parents with an expanded written description of the program and resources for questions.
- 3) An IRB disclosure form (Appendix E) was used to provide relevant information regarding the study and survey participation.
- 4) The 9-month ASQ questionnaire (Appendix F) for parent/guardian completion is part of a developmental screening tool that assesses development from 2 to 60 months of age. This brief, 30-item parent self-report measure includes five domains: communication, gross motor, fine motor, problem-solving, and personal/social. The questionnaire requires a fourth-to-sixth grade reading level, and has clear drawings and simple directions.

The ASQ is available in English or Spanish, and has test-retest reliability measured by Intra-class Correlation Coefficient (ICC) ranging from 0.75 to 0.82, indicating strong test-retest reliability for the five different domains (Squires, Twombly, Bricker, & Potter, 2009). The questionnaire takes approximately 10-20 minutes to complete and two to three minutes for the clinician to score (Ringwalt, 2008).

Each domain has six questions for parents to rate based on the presence of each skill. Answer options include: “Yes,” “Sometimes,” “Not Yet,” with point values of 10, 5, or 0,

respectively. Each domain is scored independently and the total score for each domain is transferred onto the ASQ Information Summary. The total score for each domain helps the clinician decide if the child's development appears to be on schedule, if the child should receive learning activities and monitoring, or if further assessment with a professional may be warranted (Squires et al., 2009). A cutoff score is displayed next to each domain on the ASQ Information Summary. The total domain score may be above cutoff, close to cutoff (in the monitoring zone), or below cutoff. When a child's score is two standard deviations below the mean cutoff for age in any of the five developmental domains, it is considered a positive screen (Guevara et al., 2013). This is indicated by the dark shading on the ASQ Information Summary. The lightly shaded area, or monitoring zone, is for children who fall close to the cutoff score.

- 5) A Feasibility Survey – Parent Edition (Appendix G) that was developed by the investigator had a combination of multiple choice answers, free text responses, and Likert scale questions. The Likert scale questions require response on a 5-point scale and gauge parental attitude toward the ASQ and potential future involvement, if fully implemented at this practice. Respondents indicate the degree to which they agree or disagree with the opinion in the statement (Polit & Beck, 2008). The odd number of responses allowed a midpoint or neutral response for those who were ambivalent. There is also space at the end of the survey for additional comments or suggestions.

The goal of studying the responses from this small sample population would allow me to generalize to the larger patient population in this practice. Accurate generalization relies on applying a set of procedures specifying what information will be obtained, how it will be obtained, from whom it will be collected, and how it will be analyzed (Rea & Parker, 2012). Parents completed the survey and submitted their survey to clinic staff. Issues or concerns that

are perceived as barriers to implementing the screening tool may be discovered to provide improved implementation during the next cycle.

Parent/guardians were instructed to bring the completed ASQ questionnaire and Feasibility Survey-Parent Edition to the 9-month well-child visit. Figure 3 shows how the developmental screening protocol flows in practice.

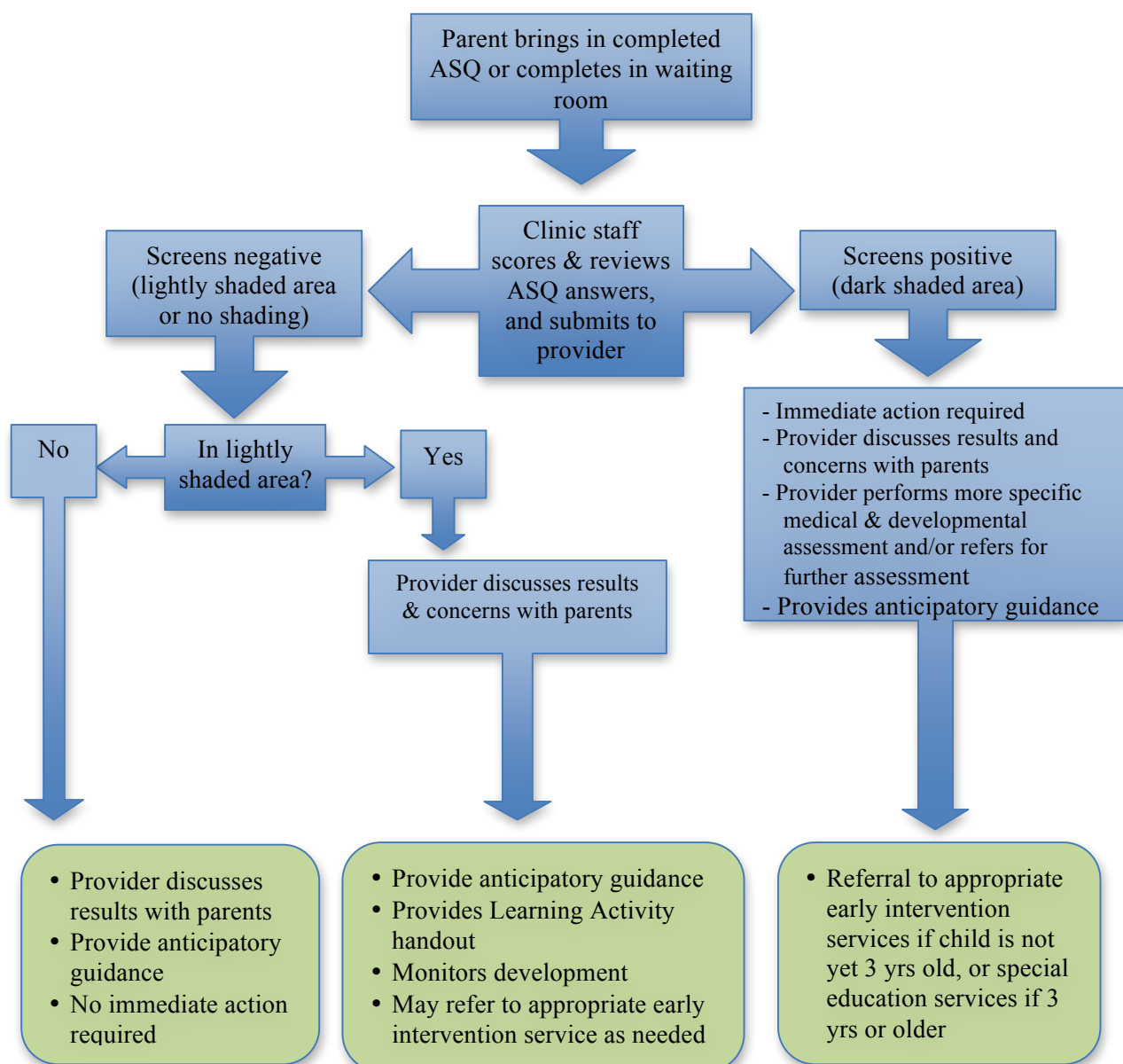


FIGURE 3. In-office Developmental Screening Protocol.

Parents/guardians who had forgotten/failed to bring the completed ASQ questionnaire or follow-up survey to the visit, were to be provided additional documents upon check-in to the office. The parent/guardian then completes the questionnaire in the waiting room prior to seeing the provider. All completed ASQ's were to be scored by clinic staff in-office, and clinicians were to review results with the parent/guardian. If the ASQ Information Summary displays the child in a dark shaded area, then immediate action and further assessment is required. Referral to either early intervention services or special education services is needed. If a child is in a lightly shaded area, or monitoring zone, appropriate learning activities were to be distributed and further assessment and/or monitoring would be provided as indicated.

The learning activity handout (Appendix I) are photocopied from the ASQ-3 User Guide and developed for use with the ASQ program. A photocopying release is included for purchasers of the ASQ-3 program, granting permission to photocopy all supplemental materials provided with the ASQ questionnaires. The intervention activity handout includes games and fun activities for parents and caregivers to perform with their children and use materials that most families have at home. The handouts target developmental domains and are broken into age intervals: 1-4 months old, 4-8 months old, 8-12 months old, 12-16 months old, 16-20 months old, 20-24 months old, 24-30 months old, 30-36 months old, 36-48 months old, 48-60 months old, and 60-66 months old. Children within the monitoring zone may benefit by practicing skills targeted in these activities (Squires et al., 2009). Once a participant's well-child visit is complete, all study materials were to be placed in an envelope behind the reception desk.

Prior to the implementation of the quality improvement project a brief in-service was to be presented to the provider, nurse, and administrative assistant involved in the implementation. They were to be introduced to the 9-month ASQ, provided directions to give parents on filling

out the ASQ, instructions on scoring the ASQ, and given sample ASQs to practice scoring. Location of extra program description handouts, disclosure forms, and ASQ questionnaires were to be identified and clearly labeled in the office. They would also receive information on score interpretation and recommendations for follow-up. Intervention activity handouts would be distributed to the provider and made available at the practice, for those children who score in the monitoring area. The sequence of data collection and workflow expectation of staff members, as described in Figures 1 and 2, would have also been reviewed. Upon completion of this project, a follow-up survey called the Feasibility Survey-Staff Edition (Appendix H), was to be given to staff to assess their attitudes toward the ASQ, its effect on workflow, strengths and limitations of the ASQ, and suggestions for improvement. Similar to the Feasibility Survey-Parent Edition, this investigator-designed survey incorporates five demographic questions, 5-point Likert scale questions, and questions requiring free text responses

Another important component to the PDSA plan step is making predictions about what will happen when the test is carried out. When implemented initial plan predictions would be

- at least 10 parents/guardians will agree to fill out the 9-month ASQ;
- at least 8 parents/guardians will complete the ASQ;
- at least half of participating parents/guardians and staff will believe the ASQ was beneficial in identifying developmental disability.

Ethical Issues

Since the purpose of this improvement project was to determine the feasibility of implementing the ASQ and determine if it is effective in identifying developmental disability, participants with diagnosed developmental disability were excluded. In these types of studies, informed consent and IRB approval must be obtained prior to initiating data collection.

University of Arizona IRB approval was obtained on October 10, 2014 and was accepted by this practice site. In all projects, human subject review from the practice site must be completed and each practice site might have different IRB requirements. Explanation of the study and pertinent information regarding participation in the survey was to be explained in a disclosure form and included in the paperwork given to the parent/guardian. All data collected was to be de-identified; every consenting participant was to be assigned a unique identifier to protect his or her identity. This unique identifier was to be placed on materials that will be mailed to the participant's home address. Parents can fill out the questionnaire in their home at their convenience, protecting the confidentiality of the individuals involved. The form identifying the patient to the unique identifier was to be placed in a secure location for the entirety of the project, and separate from all other study materials.

Planning the Study of the Intervention

The specific aim of this project is to determine the feasibility of implementing the ASQ-3 for all 9-, 18-, and 24-month well-child visits at a pediatric physicians practice, using a descriptive study. The first phase of implementation was to begin with only 9-month visits, with intentions to utilize the same process to expand to 18- and 24-month visits. When implemented, the SQUIRE guidelines for quality improvement reporting would be used to frame the report. The Feasibility Survey-Parent Edition would be given to the parent/guardian to gauge their attitudes toward the ASQ and the likelihood they would use the ASQ if offered in the future. The Feasibility Survey-Staff Edition would also assess the provider, administrative assistant, and nurse's attitude toward the ASQ, effect on workflow, strengths and limitations of the ASQ, and suggestions or changes for improvement. To understand any potential complications that may occur during implementation, a weekly correspondence was to be completed with the provider

via email. Potential complications could include participants withdrawing from the study, or any issues that arise making data collection limited or not feasible.

Methods of Evaluation

After data is collected, evaluation of the program should take place. The ASQ has been validated in the healthcare literature with high sensitivity and specificity (Limbos & Joyce, 2011); therefore, no evaluation of the tool itself was necessary prior to implementing this project. To ensure successful implementation of the ASQ for all 9-, 18-, and 24-month well-child visits at the practice, it is important to evaluate the attitude of parents and assess potential parental participation using the 9-month well visit as the exemplar. Similarly, assessment of staff perceptions on the ASQ and how the developmental screening tool affects workflow is necessary. Without staff cooperation and parental participation in completing the ASQ, the program will not be successful.

Analysis

To study the response once data collection is complete, quantitative data from the parent and staff ASQ Feasibility surveys and measures of central tendency and frequency distributions would have been used. On the parent/guardian survey, the first question asks about the amount of time (in minutes) required to complete the ASQ. The mean needs to be calculated to determine the average number of minutes it took a parent/guardian to complete the ASQ. This average number is important because if the ASQ is too time-consuming, parents may fail to fill it out. For questions 2 through 4, a frequency distribution should be constructed to determine what the highest, lowest and most common responses were. The mode and median values should also be calculated for questions 2 and 3, to determine if there was a pattern to the parental responses. Similarly, a frequency distribution, mode, and median need to be determined for questions 1 and

2 on the staff survey. The mean calculated for question 3 is to determine the average number of minutes the ASQ increased or decreased visit time. A frequency distribution should also be constructed for question 4 on the staff survey.

To study the qualitative portions of the survey, a conventional content analysis would be performed. Qualitative content analysis is a research method that analyzes text data, organizing large quantities of text into smaller content categories describing a phenomenon (Elo & Kyngas, 2008). Content analysis goes beyond counting words or intensely examining language; it systematically classifies text data through a process of coding and identifying patterns and themes (Hsieh & Shannon, 2005). Conventional content analysis is appropriate when limited research literature or theories exist regarding a phenomenon (Hsieh & Shannon, 2005). Rather than using preconceived categories, the conventional approach allows categories and names for categories to flow from the data, also known as inductive category development (Hsieh & Shannon, 2005).

Qualitative data analysis will begin with “reading all the data repeatedly to achieve immersion and obtain a sense of the whole as one would read a novel” (Hsieh & Shannon, 2005, p. 1279). Then, data is reread word by word highlighting exact words from the text that capture key concepts or thoughts. This process also includes the open coding method. Open coding occurs when notes and headings are written in the margins to describe the content while reading it (Elo & Kyngas, 2008). As many headings as necessary are created to describe all aspects of the data or content.

After open coding, the categories are further grouped into higher order headings by combining those that are similar or dissimilar into broader categories (Elo & Kyngas, 2008). The headings and notes are collected, placed on coding sheets, and categories are generated. This

process is called abstraction. Creating codes, categories and themes are examples of abstraction (Graneheim & Lundman, 2003). Abstraction, or the combination of broader categories, is not simply about reducing the number of categories, its purpose is to describe and better understand the phenomenon, and generate knowledge (Elo & Kyngas, 2008).

CHAPTER 3: RESULTS

This chapter discusses the outcomes of the DNP Project including results to the study questions. Due to implementation issues, outcomes are described without the data being collected.

Outcomes

The project was designed to answer the following questions:

1. Is it feasible to implement the ASQ at an urban southeast pediatric practice?
2. Do parents believe the ASQ is beneficial in identifying developmental disability?
3. How do the provider, administrative assistant, and nurse involved in implementation believe or perceive that the ASQ affected workflow?
4. What do the provider, administrative assistant, and nurse involved in implementation believe are the strengths and limitations of using the ASQ?

The answer to question 1 is 'no,' as it is not feasible to implement the ASQ at an urban southeast pediatric practice. Implementation was not feasible due to one stakeholder's disapproval of the change at this practice. Additionally, questions 2, 3, and 4 and the predictions related to questions 2, 3, and 4 cannot be answered with this project since the change was not implemented. However, the PDSA model was followed in that the project began with several meetings with the Clinical Chief of Pediatrics (considered a major stakeholder) to identify the problem and suggest potential solutions. These preparation meetings were viewed as successful and necessary prior to determining if a practice change could be implemented in this practice. This step in the *plan* phase of the PDSA model also established the aim of the project. It was during these initial meetings that the Clinical Chief identified the problem, the lack of standardized screening for developmental delays. These early meetings also allowed the Clinical

Chief to vocalize her hopes and goals from implementation of standardized screening, as well as create an environment to discuss potential concerns, complications and any solutions to issues that may arise during initial implementation.

During the *plan* phase, development of the right team is critical to success in improvement efforts (IHI, 2014a). Since the Clinical Chief was a provider at this practice, she was a key stakeholder and important member of the team in this project. Her expertise and opinions were important and her input influenced how the project would be implemented. For example, the Clinical Chief recommended that the provider initially screen the participants and tell parents about the study. As a result, the recruitment strategy was modified to include this method of recruitment. As a stakeholder and team member, open lines of communication were necessary for the Clinical Chief's continued support in the project. Her strong vocal support of ASQ implementation in practice successfully garnered support from other providers and staff at the practice for the implementation.

During planning meetings with the Clinical Chief, there was discussion of other important stakeholders and team members to include in this project. The project team should include members familiar with different parts of the process as well as those who work in the process (IHI, 2014a). Discussions with the Clinical Chief resulted in including the clinic manager, the nurse, and administrative assistant on our project team. Subsequent meetings and communications during the *plan* phase often included these team members.

Once the team members' input was incorporated into the proposal, then the proposal was taken to committee and then to IRB for approval. A letter of support was obtained from the clinical practice to accompany the IRB forms. IRB approval was obtained on October 10, 2014 and this IRB approval was accepted at the practice site.

Once IRB approval was obtained, another meeting was held to begin the process of implementation or the *do* phase of the PDSA model. During that meeting, another stakeholder (the clinic manager) indicated that corporate permission had to be obtained prior to implementation. Thus, the study was placed on hold until the corporate research rules could be met. During a meeting that was held with the pediatric practice's corporate research office to review plans for implementation, it became clear that a stakeholder in the corporate research office did not want the project implemented. Although this stakeholder at the corporate research office stated that this project did not pose a human subjects concern and was given the IRB approval, she refused to allow continuation of the project. Due to this unforeseen complication, the project was unable to be completed as planned.

Despite enthusiastic support from the organization's Clinical Chief of Pediatrics and staff at the selected office, the corporate research office stated that the organization needed more justification for why this practice should change their method of developmental screening. Evidence presented included the AAP's recommendations for developmental screening, evidence that the organization was not meeting these recommendations, and evidence of the support from the Clinical Chief of Pediatrics who believed the developmental screening process needed improvement. Her letter of support for the project was also provided.

Despite this evidence, a stakeholder in the corporate research office concluded this change in process was not something they were not willing to take on at this time, and thus felt a feasibility study wasn't necessary. She also vocalized concern over the cost of implementing the ASQ into practice, stating it was not an expense the organization could take on at this time. Other meetings to propose solutions to the financial challenge as well as to change the corporate stakeholder's view were unsuccessful.

One stakeholder in the corporate research office prevented implementation of this project. Although stakeholders were discussed in the *plan* phase meetings with the Clinical Chief, a formal in-depth analysis of potential stakeholders was not performed. Stakeholder mapping is a process to determine key stakeholders, where they come from, and what they are looking for (Business for Social Responsibility [BSR], 2011). The process of stakeholder mapping would have been helpful in the initial *plan* phase of this project, since the stakeholder in the corporate research office had not been considered in the discussions with the Clinical Chief. The process would have identified the corporate research office stakeholder early in the *plan* phase, allowing communication and input from this stakeholder regarding the project. This potentially could have changed the outcome of this project and eliminated this barrier to implementation.

CHAPTER 4: DISCUSSION

Summary

Although this project was unable to be completed as planned, it provided some unpredicted benefits for the pediatric practice. Several staff members and providers (practice stakeholders) that initially seemed unsupportive of the implementation changed their opinion before the conclusion of this project. Informal conversations occurred with the providers and staff at the practice, discussing the ASQ, its benefits, and how implementation would proceed. These discussions allowed questions, comments, and suggestions from staff. When the practice was told that the project would not be implemented, multiple staff members vocalized disappointment. This project also raised staff awareness of the weaknesses in the practice's current developmental assessment. Thus, by attempting this project stakeholders within the practice are now re-evaluating how developmental screening is being performed, creating an interest in practice change. As a result, future implementation of a developmental screening tool at this practice may be easier with increased stakeholder support within the practice.

The project also provided lessons about the difficulties or challenges in changing practice. It allowed me, as a future DNP leader, to learn the process of implementing practice change along with learning the barriers and challenges that can occur with this process. In future practice change projects I will strive to more thoroughly consider all potential stakeholders and their influence on project implementation. When implementing practice change stakeholders directly responsible for implementing the change are often considered. However, when implementing change under a large organization it is also important to consider the stakeholders in the organization's corporate office. In future projects I would perform stakeholder mapping to determine the key stakeholders and seek approval from the organization's corporate research

office early, during the initial planning phase when the problem or idea for change is identified. I now realize that support from stakeholders at all levels is required, as just one stakeholder can halt practice change.

Limitations

This project focused on implementation of a developmental screening tool for one specific pediatric practice within a large organization. This approach tailored implementation to the workflow, needs, and barriers specific to this practice. Since each pediatric practice has its own workflow and set of needs, the approach to implementation, although helpful for this practice, may not be generalizable to other practices. The steps set forth in this project do not provide step-by-step instruction on implementation, but rather provide guidance and points of consideration for implementation in other practice settings.

Despite support from other stakeholders including the Clinical Chief and providers, the project was not implemented. These circumstances created an increased appreciation for the role of all stakeholders within an organization. Organizations are key stakeholders to an intervention and this project spotlights how one stakeholder, who may not agree with an intervention, can dictate the outcome. Thus, prior to implementation all stakeholders' views and expectations need to be discussed and understood.

If this project had been completed as planned, it would provide valuable information on the feasibility of incorporating the ASQ into this practice. Additionally, it would also provide insight into how the ASQ would incorporate into the workflow of providers and staff. However, with only one provider participating in implementation of the ASQ, provider assessment of the ASQ post implementation would have been limited. Incorporating additional providers affords

more opinions on implementation, allowing modifications to the project and increasing chances of implementation success.

Conclusions

Due to their frequent contact with infants and young children, primary care pediatric clinicians are well suited to screen and detect developmental disability, and initiate early intervention for these children. Despite recommendations put forth by reputable associations such as the AAP, developmental screening using a standardized instrument does not occur in many primary care pediatric practices. Barriers to adoption of a developmental screening tool have often focused on clinicians, who report lack of time, confidence, or reimbursement in implementing such tools. However, this project highlights the importance of considering other obstacles, including stakeholders, and their influence on successful developmental screening tool implementation.

It is known that early detection and intervention of developmental disability is necessary to improve long-term academic and behavioral outcomes (Sices et al., 2009). Developmental screening tools such as the ASQ can increase early detection of these disabilities. Therefore, future effort should be placed on discovering barriers or obstacles to implementation and finding solutions to overcome them, thus allowing successful implementation of developmental screening tools into practice.

APPENDIX A:
INTRODUCTORY LETTER

Dear Parent/Caregiver:

My name is Mina Petrosino and I am a graduate student at the University of Arizona's Doctorate of Nursing Practice (DNP) Program. I am conducting this quality improvement project as part of my requirements for my DNP. I am interested in studying the effects of implementing a child screening/monitoring program at Sentara Pediatric Physicians. This program, entitled Ages and Stages Questionnaires[®], Third Edition (ASQ-3[™]), is a screening tool that will provide a quick-check of your child's development.

I am inviting you to participate in this study for your child's 9 month well-baby visit. If you are interested in participating, a packet containing a consent form and ASQ-3 questionnaire will be mailed to your home address prior to your child's 9 month visit. I ask that you fill out the questionnaire the week prior to your child's 9 month well-baby visit, and bring the questionnaire to that visit for scoring. I am also asking that you fill out a brief survey regarding your thoughts about using the ASQ

Thank you for taking the time to consider this opportunity. I look forward to your participation in the program.

Sincerely,

Mina Petrosino

What do I need to do to participate?

- Let your provider know you are interested in participating
- Fill out the 9 month ASQ questionnaire (takes approx. 10-15 mins)
- Fill out a brief follow-up survey, called Feasibility Survey, that takes less than 5 mins
- Bring the ASQ, and Feasibility survey to your 9 month well visit

What kind of questions will the ASQ ask?

You will be asked about things that your child may or may not be able to do (e.g.: does your baby say 3 words?). The questions are interested in your child's communication, gross motor, fine motor, problem solving, and personal-social skills.

Do I have to participate?

No, participation is voluntary and you may refuse to participate at any time.

Will my child's name and results be published?

Information gathered during this study will remain confidential in secure premises during this project. Names and other identifying details will never be published in the results of the study.

APPENDIX B:
PARTICIPANT FORM

PROJECT ID NUMBER	PATIENT LABEL
001	
002	
003	
004	
005	
006	
007	
008	
009	
010	

Tally of “**NO**” responses:

APPENDIX C:
WELCOME LETTER

Dear Parent/Caregiver:

Thank you for your willingness to participate in this study that I am conducting as part of my Doctorate of Nursing Practice program. I am interested in studying the effects of implementing the Ages and Stages Questionnaires (ASQ) at Sentara Pediatric Physicians. The enclosed ASQ screening tool will provide a quick-check of your child's development and will be scored by the provider at the 9-month well-baby visit. If you wish to have your child participate in the screening/monitoring program, please sign the consent form and fill out the enclosed 9-month questionnaire and follow-up survey.

The enclosed 9-month questionnaire will take approximately 10 minutes to complete. The follow-up survey will take less than 5 minutes to complete. There is no compensation for responding nor is there any known risk. The information you supply will help reveal your child's strengths, uncover any areas of concern, and determine if there are community resources or services that may be useful for your child or family. Participation is strictly voluntary and you may refuse to participate at any time. Information gathered during this study will remain confidential in secure premises during this project. Names and other identifying details will never be published in the results of the study.

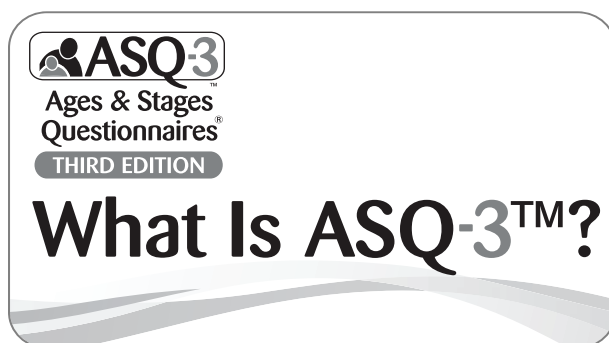
We then ask you to bring the completed questionnaire and survey to your well-child visit, so it can be reviewed with the provider. Thank you for taking the time to assist me in my education to improve health care quality of pediatric patients and I look forward to your participation in study!

Sincerely,

Mina Petrosino

mpetrosino@email.arizona.edu

APPENDIX D:
PROGRAM DESCRIPTION HANDOUT



ASQ-3 is a set of questionnaires about children's development. It has been used for more than 20 years to make sure children are developing well. It is called a *screener* because it looks at how children are doing in important areas, such as speech, physical ability, social skills, and problem-solving skills. ASQ-3 can help identify your child's strengths as well as any areas where your child may need support.

As a parent or caregiver, you are the best source of information about your child. That's why ASQ-3 questionnaires are designed to be filled out by you. You will only need 10–15 minutes. It's that quick and easy. Here's how ASQ-3 works:

- You will answer each question "yes," "sometimes," or "not yet," based on what your child is able to do now. Your answers help show your child's strengths and areas where he or she may need practice.
- To answer each question, you can try fun and simple activities with your child. These activities encourage your child to play, move around, and practice day-to-day skills.
- After you complete the questionnaire, a professional will share the results with you.

If your child is developing without concerns, there is nothing more you will need to do. You may try the next ASQ-3 age level as your child grows and learns new skills. There are 21 questionnaires that you can use with children from 1 month to 5½ years old. If your child has trouble with some skills, your program will help you with next steps. Finding delays or problems as early as possible supports young children's healthy development.

You are an active partner in your child's learning and development. By completing ASQ-3 questionnaires, you are making sure your child is off to the best possible start!

To find out more, please talk to your health care or education professional, or visit www.agesandstages.com.

APPENDIX E:
IRB DISCLOSURE FORM

Implementing a Developmental Screening Tool in Pediatric Primary Care Practice

Mina Petrosino

The purpose of this study is to determine if it is possible to implement a developmental screening tool, the Ages and Stages Questionnaires (ASQ), for all 9, 18, and 24-month well-child visits at Sentara Pediatric Physicians. These surveys will help evaluate parental attitude toward the ASQ and potential participation if implemented in the future.

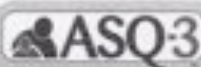
If you choose to take part in this study, you will be asked to complete a 9-month ASQ and submit it at your 9-month well-child visit. It will take approximately 10-15 minutes to complete this survey. You will also be asked to complete a brief follow-up survey called the Feasibility Survey- Parent Edition. It will take approximately 5 minutes to complete this follow-up survey. There are no foreseeable risks associated with participating in this research and you will receive no immediate benefit from your participation. However, the ASQ may reveal your child's strengths, and uncover areas of concern. It may also help determine if there are community resources or services that could be useful for your child or family. Survey responses are anonymous.

If you choose to participate in the study, you may discontinue participation at any time without penalty. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this study. An Institutional Review Board responsible for human subjects' research at The University of Arizona reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research. For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact the Human Subjects Protection Program at 520-626-6721 or online at <http://ocr.arizona.edu/hspp>.

For questions, concerns, or complaints about the study, you may contact Mina Petrosino at mpetrosino@email.arizona.edu

By taking this survey you agree to have your responses used for research purposes.

APPENDIX F:
9 MONTH ASQ


ASQ-3 Ages & Stages
Questionnaires®

9 9 months 0 days through 9 months 30 days
Month Questionnaire


Please provide the following information. Use black or blue ink only and print legibly when completing this form.

Date ASQ completed: _____

Baby's information

Baby's first name: _____ Middle initial: _____ Baby's last name: _____
 if baby was born 3 or more weeks prematurely, # of weeks premature: _____ Baby's gender: Male Female
 Baby's date of birth: _____

Person filling out questionnaire

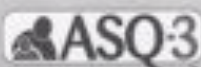
First name: _____ Middle initial: _____ Last name: _____
 Relationship to baby: Parent Guardian Teacher Child care provider
 Grandparent or other relative Foster parent Other: _____
 Street address: _____
 City: _____ State/Province: _____ ZIP/Postal code: _____
 Country: _____ Home telephone number: _____ Other telephone number: _____
 E-mail address: _____
 Names of people assisting in questionnaire completion: _____

Program Information

Baby ID #: _____ Age at administration in months and days: _____
 Program ID #: _____ if premature, adjusted age in months and days: _____
 Program name: _____

P101090101

Ages & Stages Questionnaires®, Third Edition (ASQ-3™), Squires & Bricker
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9 Month Questionnaire

9 months 0 days
through 9 months 30 days

On the following pages are questions about activities babies may do. Your baby may have already done some of the activities described here, and there may be some your baby has not begun doing yet. For each item, please fill in the circle that indicates whether your baby is doing the activity regularly, sometimes, or not yet.

Important Points to Remember:

- Try each activity with your baby before marking a response.
- Make completing this questionnaire a game that is fun for you and your baby.
- Make sure your baby is rested and fed.
- Please return this questionnaire by _____

Notes:

COMMUNICATION

- | | YES | SOMETIMES | NOT YET | |
|--|-----------------------|-----------------------|-----------------------|---|
| 1. Does your baby make sounds like "da," "ga," "ka," and "ba"? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | — |
| 2. If you copy the sounds your baby makes, does your baby repeat the same sounds back to you? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | — |
| 3. Does your baby make two similar sounds like "ba-ba," "da-da," or "ga-ga"? (The sounds do not need to mean anything.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | — |
| 4. If you ask your baby to, does he play at least one nursery game even if you don't show him the activity yourself (such as "bye-bye," "Peeka-boo," "clap your hands," "So Big")? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | — |
| 5. Does your baby follow one simple command, such as "Come here," "Give it to me," or "Put it back," without your using gestures? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | — |
| 6. Does your baby say three words, such as "Mama," "Dada," and "Baba"? (A "word" is a sound or sounds your baby says consistently to mean someone or something.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | — |

COMMUNICATION TOTAL —

GROSS MOTOR

- | | YES | SOMETIMES | NOT YET | |
|---|---|-----------------------|-----------------------|---|
| 1. If you hold both hands just to balance your baby, does she support her own weight while standing? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | — |
| |  | | | |
| 2. When sitting on the floor, does your baby sit up straight for several minutes without using his hands for support? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | — |
| |  | | | |

GROSS MOTOR

(continued)

YES SOMETIMES NOT YET

3. When you stand your baby next to furniture or the crib rail, does she hold on without leaning her chest against the furniture for support?


 —

4. While holding onto furniture, does your baby bend down and pick up a toy from the floor and then return to a standing position?


 —

5. While holding onto furniture, does your baby lower himself with control (without falling or flopping down)?

 —

6. Does your baby walk beside furniture while holding on with only one hand?

 —

GROSS MOTOR TOTAL

—

FINE MOTOR

YES SOMETIMES NOT YET

1. Does your baby pick up a small toy with only one hand?


 —

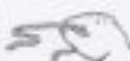
2. Does your baby successfully pick up a crumb or Cheerio by using her thumb and all of her fingers in a raking motion? (If she already picks up a crumb or Cheerio, mark "yes" for this item.)


 —

3. Does your baby pick up a small toy with the tips of his thumb and fingers? (You should see a space between the toy and his palm.)


 —

4. After one or two tries, does your baby pick up a piece of string with her first finger and thumb? (The string may be attached to a toy.)


 —

5. Does your baby pick up a crumb or Cheerio with the tips of his thumb and a finger? He may rest his arm or hand on the table while doing it.


 —

6. Does your baby put a small toy down, without dropping it, and then take her hand off the toy?




 —

FINE MOTOR TOTAL

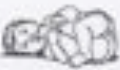
—

*If Fine Motor Item 5 is marked "yes" or "sometimes," mark Fine Motor Item 2 "yes."

PROBLEM SOLVING

	YES	SOMETIMES	NOT YET	
1. Does your baby pass a toy back and forth from one hand to the other? 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
2. Does your baby pick up two small toys, one in each hand, and hold onto them for about 1 minute? 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
3. When holding a toy in his hand, does your baby bang it against another toy on the table? 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
4. While holding a small toy in each hand, does your baby clap the toys together (like "Pat-a-cake")?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
5. Does your baby poke at or try to get a crumb or Cheerio that is inside a clear bottle (such as a plastic soda-pop bottle or baby bottle)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
6. After watching you hide a small toy under a piece of paper or cloth, does your baby find it? (Be sure the toy is completely hidden.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
PROBLEM SOLVING TOTAL				—

PERSONAL-SOCIAL

	YES	SOMETIMES	NOT YET	
1. While your baby is on her back, does she put her foot in her mouth? 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
2. Does your baby drink water, juice, or formula from a cup while you hold it?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
3. Does your baby feed himself a cracker or a cookie?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
4. When you hold out your hand and ask for her toy, does your baby offer it to you even if she doesn't let go of it? (If she already lets go of the toy into your hand, mark "yes" for this item.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
5. When you dress your baby, does he push his arm through a sleeve once his arm is started in the hole of the sleeve?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
6. When you hold out your hand and ask for her toy, does your baby let go of it into your hand?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	—
PERSONAL-SOCIAL TOTAL				—

OVERALL

Parents and providers may use the space below for additional comments.

1. Does your baby use both hands and both legs equally well? If no, explain:

YES NO

2. When you help your baby stand, are his feet flat on the surface most of the time? If no, explain:

YES NO

3. Do you have concerns that your baby is too quiet or does not make sounds like other babies? If yes, explain:

YES NO

4. Does either parent have a family history of childhood deafness or hearing impairment? If yes, explain:

YES NO

5. Do you have concerns about your baby's vision? If yes, explain:

YES NO

6. Has your baby had any medical problems in the last several months? If yes, explain:

YES NO

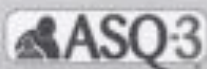
OVERALL (continued)

7. Do you have any concerns about your baby's behavior? If yes, explain:

 YES NO

8. Does anything about your baby worry you? If yes, explain:

 YES NO



9 Month ASQ-3 Information Summary

9 months 0 days through
9 months 30 days

Baby's name: _____ Date ASQ completed: _____

Baby's ID #: _____ Date of birth: _____

Administering program/provider: _____ Was age adjusted for prematurity
when selecting questionnaire? Yes No

1. **SCORE AND TRANSFER TOTALS TO CHART BELOW:** See ASQ-3 User's Guide for details, including how to adjust scores if item responses are missing. Score each item (YES = 10, SOMETIMES = 5, NOT YET = 0). Add item scores, and record each area total. In the chart below, transfer the total scores, and fill in the circles corresponding with the total scores.

Area	Cutoff	Total Score	0	5	10	15	20	25	30	35	40	45	50	55	60
Communication	13.97		●	●	●	●	●	●	●	○	○	○	○	○	○
Gross Motor	17.82		●	●	●	●	●	●	●	●	○	○	○	○	○
Fine Motor	31.32		●	●	●	●	●	●	●	●	●	○	○	○	○
Problem Solving	28.72		●	●	●	●	●	●	●	●	○	○	○	○	○
Personal Social	18.91		●	●	●	●	●	●	●	○	○	○	○	○	○

2. **TRANSFER OVERALL RESPONSES:** Bolded uppercase responses require follow-up. See ASQ-3 User's Guide, Chapter 6.

- | | | | | | |
|--|------------|-----------|--|------------|----|
| 1. Uses both hands and both legs equally well?
Comments: _____ | Yes | NO | 5. Concerns about vision?
Comments: _____ | YES | No |
| 2. Feet are flat on the surface most of the time?
Comments: _____ | Yes | NO | 6. Any medical problems?
Comments: _____ | YES | No |
| 3. Concerns about not making sounds?
Comments: _____ | YES | No | 7. Concerns about behavior?
Comments: _____ | YES | No |
| 4. Family history of hearing impairment?
Comments: _____ | YES | No | 8. Other concerns?
Comments: _____ | YES | No |

3. **ASQ SCORE INTERPRETATION AND RECOMMENDATION FOR FOLLOW-UP:** You must consider total area scores, overall responses, and other considerations, such as opportunities to practice skills, to determine appropriate follow-up.

If the baby's total score is in the area, it is above the cutoff, and the baby's development appears to be on schedule.

If the baby's total score is in the area, it is close to the cutoff. Provide learning activities and monitor.

If the baby's total score is in the area, it is below the cutoff. Further assessment with a professional may be needed.

4. **FOLLOW-UP ACTION TAKEN:** Check all that apply.

- Provide activities and rescreen in _____ months.
- Share results with primary health care provider.
- Refer for (circle all that apply) hearing, vision, and/or behavioral screening.
- Refer to primary health care provider or other community agency (specify reason): _____
- Refer to early intervention/early childhood special education.
- No further action taken at this time
- Other (specify): _____

5. **OPTIONAL:** Transfer item responses (Y = YES, S = SOMETIMES, N = NOT YET, X = response missing).

	1	2	3	4	5	6
Communication						
Gross Motor						
Fine Motor						
Problem Solving						
Personal-Social						

APPENDIX G:
FEASIBILITY SURVEY – PARENT EDITION

Dear Parent/Caregiver,

Please complete the following information and thank you for your participation in this study!

What is your age? _____

Are you female? _____ male? _____ (check one)

How many years of education do you have? _____

How many children do you have? _____

How long has your child been seen at this practice? _____

1. Approximately how long did it take you to fill out the 9 month ASQ questionnaire?

_____ minutes

For the next three (3) questions, please circle the answer that best expresses your opinion.

2. The ASQ questionnaire was helpful in identifying possible developmental delays in my child.

Strongly disagree

Neutral

Strongly agree

1

2

3

4

5

3. If the ASQ was offered by this practice for 9, 18 and 24 month well checks, I would want to complete this for my child.

Strongly disagree

Neutral

Strongly agree

1

2

3

4

5

4. If implemented at this practice, what would be your preferred method for receiving the ASQ prior to a well check?

A. regular mail

B. email/online

Comments/suggestions: _____

APPENDIX H:
FEASIBILITY SURVEY – STAFF EDITION

Please help evaluate the Ages and Stages Questionnaire by answering the following questions.

What is your age? _____

Are you female? _____ male? _____ (check one)

How many years of education do you have? _____

What is your occupation? _____

How long have you been employed at this practice? _____

1. The ASQ is helpful in identifying developmental delays in children.

Strongly disagree	Neutral			Strongly agree
1	2	3	4	5

2a. Using the ASQ changed the time spent per visit.

Strongly disagree	Neutral			Strongly agree
1	2	3	4	5

2b. Approximate number of minutes: _____ added per visit
 _____ decreased per visit

3. Would you like to see the ASQ used by this practice?

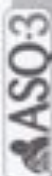
Yes No I'd like to see a different tool implemented

4. If implemented at this practice, which method do you think would be best for distributing the ASQ-3 to parents?

A. regular mail B. email/online

5. What did you like best about ASQ?

APPENDIX I:
LEARNING ACTIVITY HANDOUT



Activities for Infants 8-12 Months Old

<p>Let your baby feed himself. This gives your baby practice picking up small objects (cereal, cooked peas) and also gives him experience with textures in his hands and mouth. Soon your baby will be able to finger feed an entire meal.</p>	<p>Your baby will be interested in banging objects to make noise. Give your baby blocks to bang, rattles to shake, or wooden spoons to bang on containers. Show your baby how to bang objects together.</p>	<p>A good parent is putting objects in and out of containers. Give your baby plastic containers with large beads or blocks. Your baby may enjoy putting socks in and out of the sock drawer or small cartons (Jell-O, tuna or soup cans) on and off shelves.</p>	<p>Mirrors are exciting at this age. Let your baby pat and poke at herself in the mirror. Smile and make faces together in the mirror.</p>	<p>Your baby will begin using his index fingers to poke. Let your baby poke at a play telephone or busy box. Your baby will want to poke at faces. Name the body parts as your baby touches your face.</p>
<p>Put toys on a sofa or sturdy table so that your baby can practice standing while playing with the toys.</p>	<p>Find a big box that your baby can crawl in and out of. Stay close by and talk to your baby about what she is doing. "You went in! Now you are out!"</p>	<p>Read baby books or colorful magazines by pointing and telling your baby what is in the picture. Let your baby pat pictures in the book.</p>	<p>Play hide-and-seek games with objects. Let your baby see you hide an object under a blanket, diaper, or pillow. If your baby doesn't uncover the object, just cover part of it. Help your baby find the object.</p>	<p>Play ball games. Roll a ball to your baby. Help your baby, or have a partner help him roll the ball back to you. Your baby may even throw the ball, so beach balls or Nerf balls are great for this game.</p>
<p>Turn on a radio or stereo. Hold your baby in a standing position and let your baby bounce and dance. If your baby can stand with a little support, hold her hands and dance like partners.</p>	<p>Play imitation games like Peek-a-boo and So Big. Show pleasure at your baby's imitations of movements and sounds. Babies enjoy playing the same games over and over.</p>	<p>Let your baby play with plastic measuring cups, cups with handles, sieves and strainers, sponges, and balls that float in the bathtub. Bath time is a great learning time.</p>	<p>Play Pat-a-Cake with your baby. Clap his hands together or take turns. Wait and see if your baby signals you to start the game again. Try the game using blocks or spoons to clap and bang with.</p>	<p>Your baby will play more with different sounds like "la-la" and "da-da." Copy the sounds your baby makes. Add a new one and see if your baby tries it, too. Enjoy your baby's early attempts at talking.</p>
<p>Make a simple puzzle for your baby by putting blocks or Ping-Pong balls inside a muffin pan or egg carton.</p>	<p>You can make a simple toy by cutting a round hole in the plastic lid of a coffee can. Give your baby wooden clothes pins or Ping-Pong balls to drop inside.</p>	<p>Say "hi" and wave when entering a room with your baby. Encourage your baby to imitate. Help your baby wave to greet others. Waving "hi" and "bye" are early gestures.</p>	<p>Let your baby make choices. Offer two toys or foods and see which one your baby picks. Encourage your baby to reach or point to the chosen object. Babies have definite likes and dislikes!</p>	<p>New places and people are good experiences for your baby, but these can be frightening. Let your baby watch and listen and move at her own speed. Go slowly. Your baby will tell you when she is ready for more.</p>

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