

**A Pediatric Office-Based Quality Improvement Project in a Rural Health Clinic:
Retrospective Evaluation**

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Abstract

Purpose: An office-based pediatric quality improvement project was implemented to increase the number of well-child health visits and increase the documentation of pediatric quality measures in a Midwest rural clinic.

Project Description: The Bright Futures framework provided the structure for the project and a retrospective evaluation was performed six months after the initiation of practice changes, reminder letters, and public service announcements. Chart review was performed with a convenience sample of children ages 0 to 47 months from the database of the organization that supports the family practice clinic and emergency department. The descriptive analysis included change in proportions and percentages and chi-square analyses.

Outcomes: There was an increase the number of well-child visits by 65% in the six month period with a wider range of ages being seen. There was a 40% response rate of visits within two months of the reminder letters. Documentation increased in four out of nine quality measures with two measures remaining at 100%. Validated developmental and behavioral assessment tools

were used consistently. A dialogue with the local health department was established to coordinate immunization and well-child visits.

Conclusions: The practice changes were found to be sustainable and consistent with quality pediatric care.

Keywords: Rural pediatric, Office-based, Quality improvement

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Background

Well-child preventive health (WCPH) visits, with a consistent source of care, are the cornerstone of child primary practice and lead to fewer unmet health needs, improved continuity of care, and opportunity for earlier intervention for problems (DeVoe, Saultz, Krois, & Tillotson, 2009). Caregivers of children want information regarding the health and development of their children, education regarding appropriate child rearing practices, and reassurance with time to discuss those areas of importance to the parent (Radecki, Olson, Frintner, Tanner, & Stein, 2009). A family centered approach is essential to successful pediatric care. It enables the child and family to develop capacities to interact successfully with the biological, physical, and social environment, and achieve one's health and developmental potential (Bethell, Reuland, Schor, Abrahms, & Halfon, 2011). Early childhood development includes physical, emotional, and social aspects, with each child developing at their own pace. Regular assessment using quality measures assists with finding delays or problems and allows for early intervention. Pediatric quality indicators for well-child preventive care have been defined by the National Committee for Quality Assurance (2011) and *The Bright Futures Guidelines for Health Supervision of*

Infants, Children, and Adolescents (Hagan, Shaw, & Duncan, 2008). The Bright Futures initiative was started in 1990 with funding from the U.S. Department of Health and Human Resources and Services Administration, Maternal and Child Health Bureau. It contained evidence-based strategies and tools to improve child health. The American Academy of Pediatrics has led the initiative since 2001 with input from other organizations focused on child health (Hagan et al., 2008).

The first three years of life are a time of phenomenal growth in all areas of a child's development; therefore, the ages of 0 through 47 months were chosen as the focus of this project. Twelve WCPH visits are recommended during the first 36 months of life with nine of the WCPH visits occurring between the ages 0 to 15 months (Hagan et al., 2008).

Local Problem

As rural practitioners have discontinued their obstetric practices, pregnant females must travel a longer distance for prenatal care and delivery (Cohen & Coco, 2009). WCPH visits are often performed in the same community as obstetric care, which presents an access problem for the rural dweller. Time, distance, and the financial burden of travel often prevent the recommended number of WCPH visits from taking place (U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau [USDHHS], 2011). The Centers for Disease Control and Prevention (n.d., a) estimated that 17% of the children in the United States have a behavioral or developmental problem with less than 50% being identified before starting school. These low rates of detection have created missed opportunities for health promotion/disease prevention, early identification of problems with early intervention, and anticipatory guidance in children (Bethell et al., 2011).

In like manner, the local Midwest rural hospital and the associated rural health clinic (RHC), where the quality improvement project took place, discontinued obstetric care in the early 1990's. Within five years the RHC eliminated childhood immunization services due to vaccine costs and storage issues. The local county health department (LHD) became the sole provider of childhood immunizations in the county since centralization at one site is cost effective in the rural setting (Freed, Cowan, & Clark, 2009; Glazner, Beaty, Pearson, & Berman, 2004; Glazner, Beaty, & Berman, 2009). With closure of obstetric and immunization services the WCPH visits at the RHC decreased and have remained at low levels (McNamar, 2008). In 2009, local primary care providers (nurse practitioners and physicians) in the rural county were interviewed by the primary author. The local providers presumed that WCPH visits were being completed at the time of immunizations at the LHD (P. Wilhelm, P. Meador, & R. Garcia, personal communication, August 15, 2009). A follow-up interview conducted by the primary author with the LHD administrator found that WCPH visits were not routinely being performed with the immunizations due to budget constraints and lack of personnel unless an obvious need was identified or upon parental request (H. Hinke, personal communication, August 16, 2009).

During an internal assessment at the RHC in 2009, the clinic family nurse practitioner (FNP) (primary author) determined that the RHC was underprepared to conduct WCPH visits. Some of the equipment for well-child care was not functional, forms were inappropriate, the developmental tool did not meet current standards, and preventive/child health promotion materials were unavailable. Staff needed education regarding current WCPH visit guidelines (McNamar, 2008).

Setting

The RHC is part of a hospital district located in a frontier county in a Midwest state, with 4.3 persons per square mile (U.S. Census Bureau, 2012). A simple definition of frontier is a county with six or fewer people per square mile (Rural Assistance Center, n.d.). According to the U. S. Department of Agriculture Economic Research Service (USDA, n.d.), the county of the RHC is classified with a frontier and remote area code (FAR) of 1. A county FAR area code of 1 designates that the majority of the population lives 60 minutes or more from an urban area of 50,000 people or more (U.S. Department of Agriculture, Economic Research Service [USDA], 2013). A rural urban continuum code (RUCC) of nine is given to the county of the RHC (USDA, 2013). A county with a RUCC of nine designates a county that is completely rural, not adjacent to a metro area (USDA, 2013). Complex issues of isolation, distance, time, and cost to travel for care are common. The hospital district includes the RHC, a critical access hospital (CAH), and a nursing home. At the time of the project, there were approximately 1629 people in the hospital district, with 104 children below the age of 5 (U.S. Census Bureau, 2012). The RHC had two providers that included an FNP (primary author) and a physician (MD). In addition to the providers, the RHC staff included an office manager, an office assistant/nursing assistant and two registered nurses.

The database of the hospital district contained 90 children who were 47 months of age or less and seen either in the RHC mainly for ill-child visits or in the emergency room (ER) of the CAH for ill-visits during 2011. During the first six months of 2011, 2245 patient visits occurred at the RHC, with 23 WCPH visits (1%) made with 15 children.

Planning the Office-Based Quality Improvement Project

The design of the project evaluation was retrospective with a chart review six months after implementation of practice changes in the RHC. The office-based quality improvement (OBQI) project was focused on children, ages 0 through 47 months, who received well-child preventive health (WCPH) visits at the RHC. The aims were to evaluate change in the following key measures from the six month baseline pre-implementation period (Phase 1) to the six month post-implementation period (Phase 2) of the OBI:

- The number of well-child preventive health (WCPH) visits
- The use and documentation of pediatric quality measures for WCPH visits
- The number of children, ages 0-15 months with 2 or more WCPH visits

Initially, a business plan was developed and presented to the Chief Executive Officer (CEO) that cited a potential for increased revenue from an increase in WCPH visits while costs would be minimal (McNamar, 2010). After administrative approval, the clinic infrastructure was updated. Equipment necessary for well-child care services was purchased in 2010 at a cost of approximately \$1156. An in-service for clinic staff on the recommended well-child preventive health visit content was presented by a pediatrician from the local state chapter of the American Academy of Pediatrics at no charge. Use of the Ages and Stages Questionnaire (ASQ) and the Modified Checklist for Autism for Toddlers (M-CHAT) was reviewed with the primary author (FNP), MD, and nursing staff. The ASQ is a developmental screen for young children ages 1-66 months and has established validity and reliability (Squires, Twombly, Bricker, & Potter, 2009). The M-CHAT is a screening tool for autism that contains 23 items and may be used in children from 16-30 months (Robins, Fein, & Barton, 1999).

Formal and informal staff meetings were conducted prior to and during implementation to update and refresh staff on WCPH visit guidelines, discuss problems and answer questions. Public service announcements describing the purpose and importance of well-child visits were placed in the local weekly newspaper the month prior to implementation, during the first month of the project, and then every two months during the next six months. A database of children less than 48 months of age seen in the clinic for sick or well-visits or in the emergency room for sick visits during the year prior to the OBQI was developed from the hospital district records. The database was used to send reminder letters at the beginning of the project and monthly. The reminder letters focused on the purpose and importance of well-child visits and invited parents to bring their child to the RHC for an initial or subsequent WCPH visit. A record of letters mailed was kept for evaluation of response rate. A brochure, specific to the RHC, was developed that described the purpose of well-child visits and was distributed at the county health fair, hospital, clinic, emergency room, and various places in the community.

The quality measures selected were length/weight, age appropriate anticipatory guidance in all children, head circumference in children up to age 24 months, body mass index (BMI) beginning at two years, developmental screening using the ASQ at all visits beginning at age 2 months, autism screening using the M-CHAT in ages 17.5 to 30 months, and lead screening and referral if risk factors were present in all children age 6 months and older.

The quality measures also included documentation of maternal depression screening in mothers who presented with infants ages six months or younger. The validated Edinburg Postnatal Depression Scale (EPDS) with 10 items was used as recommended in Bright Futures (Hagan et al., 2008; Cox, Holden, & Sagovsky, 1987). Schaar (2011) discussed the ease of implementation of the EPDS into practice with its third grade reading level that made it

appropriate for the general population. Olson, Dietrich, Prazar, & Hurley (2006) cited numerous studies demonstrating the adverse impact maternal depression can have on a mother's ability to parent effectively. Mothers with depressive symptoms are more likely to seek urgent care for their child and utilize more health services and are less likely to limit TV, to read to their child, and to implement safety measures (Olson, Dietrich, Prazar, & Hurley, 2006; Walker, Im, & Tyler, 2013). Time and distance to follow up care for postpartum women combined with lower economic status in rural areas are barriers to missed discussions of depression (Walker et al., 2013).

A preventive services prompting tool (PSPT) was developed outlining the quality measures to be included at a particular age visit. The PSPT was a table modeled after the Recommendations for Preventive Pediatric Health Care (RPPHC) (Hagan et al., 2008) with ages along the horizontal axis and quality measure listed on the vertical axis. Shading was provided at the intersection of the axes to indicate that a particular quality measure should be assessed at a particular age visit. The tool was given to the FNP (primary author) and MD to assist with documentation. In the clinic intake room, the PSPT was placed on the wall to act as a visual reminder for staff while obtaining vital signs, length/weight, or body mass index (BMI) measurement. The Bright Futures Tool and Resource Kit (American Academy of Pediatrics [AAP], 2010) was purchased and topics from the toolkit were used to prepare packets of age appropriate anticipatory guidance material to be distributed to parents at the time of the well-child visits.

The FNP and MD at the RHC chose to use the ASQ at each WCPH visit starting at age 2 months and the M-CHAT was used at any WCPH visits between ages 17.5 months through 30 months visit in an attempt to ensure screening was done at the recommended intervals (Hagan et

al., 2008). After feedback from parents that it was difficult to complete all the items on the developmental or behavioral assessment in the waiting room the forms were mailed with the reminder letters starting in month three of the project.

Evaluation of the OBQI Aims

Ethical Issues

Approval was obtained from the CEO of the RHC on April 6, 2012 and the University Institutional Review Board (IRB) on August 3, 2012 to conduct a retrospective analysis of the OBQI project (IRB protocol # 22079). The data were retrieved from the medical records by the RHC FNP (primary author) who normally had access to the information. Charts were reviewed of children, ages 0 through 47 months, seen for well-child visits in Phase 1 (January-June 2011) and Phase 2 (January-June 2012) at the RHC upon completion of the six month project. Each medical record was accessed only one time and data were recorded anonymously in an excel data file. The project and objectives are consistent with the scope of practice of an advanced practice registered nurse who is certified as a FNP (Kansas State Board of Nursing, 2012).

Sample and Data Analysis

Ninety children less than 48 months of age who had visited the clinic or emergency room in 2011 were considered available for WCPH visits during 2012 for the OBQI. The Phase 1 comparison group was defined by the children ages 0 through 47 months who had been eligible for WCPH visits in 2011 ($n=86$), with a focus on those children who had WCPH visits in the baseline period, January through June 2011.

A retrospective chart review was performed six months after the implementation of the OBQI project. Charts were reviewed of children seen for well-child visits at the RHC in Phase 1 (prior to project period) and Phase 2 (after implementation). Data retrieved include age, gender,

ethnicity, and type of payer. Additional data included: the phase the child was seen, the number of visits made in each phase, the age in months of the first visit in the phase, the number of visits made between 0 to 15 months, and the number of times each quality measure was recorded if appropriate for age. For Phase 2, the date for reminder letters and if a visit occurred within two months of each reminder letter were noted.

Data were recorded in an Excel spreadsheet and uploaded into SPSS (version 20). Descriptive statistics were used to describe the population, including age, gender, race/ethnicity, and type of payer. The total number of well-child visits was calculated for each phase. Chi-square analyses and descriptive analyses, including change in proportions and percentages, were performed to calculate if there was a significant increase in the number of WCPH visits and in the number of documented quality indicators between pre- and post-implementation.

Results

Demographics

Table 1

Demographics Characteristics

Total Number of visits	Phase 1 (n = 15)	Phase 2 (n = 26)
Gender		
Male	6 (40%)	14 (54%)
Female	9 (60%)	12 (46%)
Ethnic/Racial		
White/Non-Hispanic	12 (80%)	20 (77%)
Black	2 (13%)	3 (11.5%)
German/Mennonite	1 (7%)	3 (11.5%)
Payer		
Cash	1 (7%)	0
Medicaid	8 (53%)	17 (65%)
Private Insurance	6 (40%)	9 (35%)

The demographic characteristics are shown in Table 1. The majority of children were insured by Medicaid in both phases. The percentage of minority children that utilized the RHC for well child visits was greater than the percent noted in the 2010 census data for the county (whites -96%, Hispanic- 2.4%, blacks (0.5%), and other (1%) (U.S. Census Bureau, 2012).

Outcomes

There was an increase in the total number of WCPH visits by 65%. In Phase 1 there were 23 visits by 15 children: nine children had one visit; four children had two visits; two children had three visits. Thirty-eight WCPH visits made by 26 children in Phase 2: 19 children had one visit; three children had two visits; three children had three visits; one child had four visits. There were 13 visits in children ages of 0 to 24 months in Phase 1 as compared to 18 visits in the same age group in Phase 2. During the project period the percent of WCPH visits increased to 1.7% of the total number of RHC visits.

There was no significant difference in the number of children aged 0 to 15 months with two more WCPH visits during Phase 2 as compared to Phase 1. In Phase 1 there were 6 of 13 (46%) eligible children with two or more visits, while in Phase 2 there were 6 of 12 (50%) eligible children. The age of the child and the time of the visit needed to be considered for eligibility. In Phase 2, although there were a total of 12 children aged 0 to 15 months, two children had their first visit in the last month of the project and one child had the first visit at age 15 months. There were only nine children aged 0 to 15 months in Phase 2 eligible to have the suggested 9 visits. Six of the nine children had two or more visits. All of the 13 eligible children in Phase 1 were young enough and seen early enough in the study to have had more than one visit. Table 2 shows the age range in each phase, with Phase 2 demonstrating a wider range of ages.

Table 2

Age of Children in Months

Phase (n)	Mean (SD)	Range
1 (15)	7 (7.2)	0.1- 24
2 (26)	18.5 (11.8)	0.2- 38

An 11.5% percent increase was seen in children who attended the RHC and had one or more WCPH visits in Phase 2 compared with Phase 1. In Phase 1 there were 15 children who had WCPH visits out of 86 eligible children (17.4%). In Phase 2 there were 26 children who had WCPH visits out of 90 eligible children (28.9%). Nine children had WCPH visits in both phases. Although the plan was to use McNemar's test on the paired data and chi-square analysis on the non-paired data, the sample size was not large enough to perform McNemar's test. Data were not collected on those children who had WCPH visits prior to Phase 1.

There was a 40% response to the reminder letters within two months in Phase 2. Ninety general reminder letters were sent during month one of the project. Over the next five months, 85 age-specific reminder letters were sent and 34 WCPH visits were made within two months. In addition, several visits were made after the two month period. These visits may be attributed to the general or specific reminder letters, the newspaper articles, brochures or handouts in the community, and/or public service flyers available at the immunization clinics at the LHD.

The documentation of quality measures is shown in Table 3. Between Phase 1 and Phase 2 there was an increase in documentation of four quality measures, though none showed a significant increase: anticipatory guidance, BMI, use of M-CHAT, and lead screening. There was no change in length/weight documentation and documentation of referral in any child with a positive lead screen was 100% in both phases. Though not statistically significant, BMI documentation percent increased the most.

There was no increase in documentation of use of the ASQ or the EPDS. The ASQ was used sporadically in Phase 1 and in all ages starting at age 2 months as planned for Phase 2 with the goal of having at least one screen performed per child, in case the child did not return for the next scheduled WCPH visit. Initially, parents completed the ASQ or M-CHAT in the clinic. After feedback from parents, the forms were mailed with the reminder letters starting in month 3 of Phase 2. Mailings increased the number of forms returned, but some forms were forgotten at home. If the form was returned at a later time, the documentation of its return and evaluation was not recorded in the chart.

Table 3

Documentation of Quality Measures

Quality Measure	Phase 1 (n) = 23	Phase 2 (n) = 38	% change	Chi-square
Lth/Wt	23/23 (100%)	38/38 (100%)	↔	Not computed
AG	22/23 (95.7)	38/38 (100%)	↑	$X^2(1) = 1.680, p = 0.195$
HC	21/23(91.3)	27/31 (87.1%)	↓	$X^2(1) = 0.237, p = 0.627$
BMI	0/1 (0%)	10/11 (90.9%)	↑	Fisher's Exact $p = 0.167$
ASQ	7/8 (87.5%)	16/22 (72.7%)	↓	$X^2(1) = 0.716, p = 0.398$
M-CHAT	0/2 (0%)	3/11 (27.3%)	↑	Fisher's Exact $p = 0.577$
LS	2/23 (8.7%)	9/38 (23.7%)	↑	Fisher's Exact $p = 0.128$
LR	2/2 (100%)	4/4 (100%)	↔	Not computed
EPDS	3/12 (25%)	3/12 (25%)	↔	Not Computed

Note. Lth/Wt = length/weight; AG = Anticipatory Guidance; HC = Head Circumference; BMI = body mass index; M-CHAT = Modified Checklist for Autism in Children; LS = Lead Screening; LR = Lead Referral; EPDS = Edinburgh Postnatal Depression Scale; ↑ = increased; ↓ = decreased; ↔ = no change.

Discussion

Summary

The OBQI project had several outcomes that were clinically significant with several potential child and organizational benefits noted in Phase 2. There was an overall increase in the number of WCPH visits with a wider range of ages and more children ages 0 to 24 months having at least one visit. Eleven new children had WCPH visits including three newborns. The age-specific reminder letters proved beneficial with a 40% response within two months of the

mailings. Parents, both new and returning, often commented about an increased awareness of the benefits of WCPH visits. Several parents who brought their children to the RHC for their first WCPH visit stated they became aware of the RHC ability to provide the service through the public awareness campaign and/or the reminder letters they received. Documentation of four quality measures showed an increase with a 90% increase in BMI documentation—one of the measures required for meaningful use with electronic health records (Centers for Medicare and Medicaid Services, n.d.). Documentation of two measures remained at 100% and one remained at 25%. Through mailing of the developmental and behavioral tools, the clinic is now consistently using standardized tools across a large range of ages beginning at age 2 months.

Through informal discussion with the primary author and other staff members during Phase 2 and after the OBQI was ended, several parents stated they preferred “one stop shopping” where they could complete well-child visits and immunizations all at the same time. If that was not possible, often a choice was made. Immunizations are required for daycare and school admission; well child visits are not. Frequently, due to work schedules, time, distance and travel costs, immunizations at the LHD located 25 miles from the RHC were chosen and well-child visits were not seen as a priority. After completion of the OBQI project, the primary author began discussion with the administrator of the LHD in an effort to find a way to provide the WCPH visits by the RHC and the immunizations by the LHD at the same setting.

Costs and revenue have been tracked. In the pre-implementation phase, approximately \$1156 was spent upgrading the physical infrastructure with the purchases of electronic infant scales, a yearly subscription to a professional pediatric online care resource, updated ASQ, and pediatric visit documentation forms. Ongoing costs are estimated at \$250 annually for the online resource. The utilization of the pediatric portion of the EHR will eliminate any further purchases

of documentation forms. There were no staff additions and staff were able to incorporate the time to send the reminder letters within the work week. The paper and postage of the monthly reminder letters continue at the cost of approximately \$10/month. The revenue from the 2011 Phase 1 WCPH visits was \$1710, and the revenue from the 2012 Phase 2 WCPH visits was \$2881.

RHC access to the state immunization registry has been beneficial for the children and the LHD. During WCPH visits, FNP, MD, and nursing staff are able to counsel parents regarding missed or upcoming immunizations and provide information when local immunization clinics are scheduled. In addition, the hospital's infection control nurse has begun entering adult immunizations into the state immunization registry and has improved the reporting of adult immunizations. The RHC staff began recording the adult and pediatric immunizations from the paper charts into the electronic health record.

During Phase 2, implementation of an electronic health record (EHR) began system wide at the RHC and hospital. With the emphasis on improving WCPH visits, the project increased the familiarity and use of the pediatric portion of the EHR and improved documentation by the RHC's providers and registered nurses.

Relation to Evidence

Rural children are more likely to be poor and live below the poverty level (National Rural Health Association, n.d.). Children in poverty are more likely to have physical health problems such as low birth weight or lead poisoning, and behavioral and emotional problems (USDHHS, 2011). Children in poverty also tend to exhibit cognitive difficulties, as shown in achievement test scores, and are less likely to complete basic education (USDHHS, 2011). Table 4 shows data for the county the RHC serves.

Table 4

Rural risk factors

Indicator	RHC County	Other Frontier Counties
% in Poverty*	19.4%	19.61%
% <6yrs in poverty**	11.7%	(No data available)
Low birth wt infants*	8.11%	7.43%
Elevated blood lead levels (2008)***	2.3% of the 43 tested (available n= 290)	53.10% risk d/t housing**
Youth Tobacco use*	15.96%	13.78%
Hospitalized for Mental Health*	0.91%	0.78%
High School Graduation*	91.8%	89.54%

* (Kansas Action for Children, 2012)

** (Healthy Communities Institute, n.d.)

*** (Centers for Disease Control and Prevention, n.d., b)

Receipt of a yearly WCPH visit is estimated to be 85.9% of all eligible children in small rural areas (RUCC greater than 6.1) (USDHHS,2011). That statistic is higher at 93.6 % when looking at the ages 0-5years in small rural areas (USDHHS,2011). Prior to the OBQI project the RHC was well below that statistic with only 17.4% of the eligible children receiving a yearly WCPH at the RHC. The OBQI project increased that percent by 11.5%.

It is suggested that many of the adult illnesses and chronic diseases have their start or basis in childhood (Coker, Thomas, & Chung, 2013). Coker et al. (2013) contend that well-child preventive health visits could change patterns that normally would lead to adult morbidity and mortality. In the RHC's county the rate of adults diagnosed with diabetes is 20.4%, which is above the national average of 8.3%. The prevalence of hypertension, the number one cause of stroke and other co-morbid conditions is 44.3% in the RHC's county. The county of the RHC ranks third in the state for prevalence of chronic lung disease and accounting for 53.3 deaths per 100,000 with cancer deaths being the number one cause of death with 225.7 deaths per 100,000 population (Healthy Communities Institute, 2013). Childhood interventions, including WCPH visits, have the potential to promote healthy lifestyles and influence later adult health in rural areas.

Anecdotal feedback to the RHC staff from parents who brought their children to the RHC for WCPH revealed parental satisfaction with the amount of time spent by the provider, with parental questions solicited and addressed, health and developmental assessments reviewed and discussed, and anticipatory guidance provided on child rearing practices. Understanding why parents bring their children for well-child care is important for initial and continued care (Radecki et al., 2009) and confirms that time spent during visits increases parental satisfaction (Halfon, Stevens, Larson, & Olson, 2011).

The consistent use of standardized developmental and behavioral tools led to early identification of problems or delays and allowed early referral and intervention. Three children were referred for evaluation of developmental delays and one child for growth delay.

Lannon et.al, (2008) assessed the ease of implementing practice changes in 15 pediatric primary care practices. Six office components to improve preventive and developmental care were compared before and after an educational intervention. The six components included the “preventive services prompting system, structured developmental assessment, parental strength and needs assessment, recall/reminder system, community linkages checklist, and identification of children with special healthcare needs” (Lannon et al., 2008, p 166). The last three components were most frequently adopted. The intervention project of Lannon et al. (2008) found that rural practices had the greatest degree of success of implementing practice changes based on the screening activities listed in the RPPHC from Bright Futures (Hagan et al., 2008). Evaluation of the practice changes at the RHC illustrated that implementation of key components of the framework was possible with a small number of clinic staff and providers. Reminder letters increased the number of visits made and increased the number of young children having preventive visits. Use of the PSPT was instrumental in identifying the quality areas for

assessment and documentation by the staff. The strengthening of community linkages with the LHD provided opportunities to find solutions to improve the delivery of WCPH visits and immunization rates. The consistent use of developmental and behavioral tools and quality measures documentation increased the identification of children with special needs with three children referred for further evaluation during the project period. The eliciting of parental concerns and discussion of age appropriate anticipatory guidance furnished a time to assess parental and child strengths and needs (Lannon et al., 2008).

Barriers and Limitations

Evaluation of the project occurred after six months and many office-based changes were made at the same time. It will be important to track the number of well child visits, parental feedback/satisfaction using a formal systematic method, as well as associated costs over a longer time frame. The low volume of children seen did not allow for staff to stay familiar with WCPH visit guidelines. The preventive services prompting tool was available to assist with age-specific visit content but was not utilized to its full extent. This was evidenced by the slight decrease in the percent of young children with documentation of head circumference.

Finding time to include all the necessary components in a visit and a preference for brief screening tools (rare use of the EPDS) by the providers were identified as barriers to the project. In discussion by the primary author (FNP) with MD at the RHC it was confirmed maternal depression screening was being performed but more often with a non-validated screening tool. Lack of belief that the EPDS would change the screening outcomes led to low use of the validated tool during the WCPH visit. This finding is consistent with patterns in other RHCs (Tudiver, Edwards, & Pfortmiller, 2010). It was then decided by the FNP and MD at the RHC to use the EPDS only at the postpartum follow-up visit with the mother to assess for depression.

The Patient Health Questionnaires (PHQ-9 & PHQ-2) are alternative brief validated depression screening questionnaires (AAP, 2010) with the PHQ-9 available in English and 30 other languages (American Psychological Association, n.d.) and are being evaluated for use during the WCPH visits.

Sustaining the reminder system by the clinic FNP (primary author) was time consuming. The RHC staff is working with the electronic health record (EHR) software provider to implement a recall and reminder system through the EHR. At the time of the project implementation, training for use of the EHR also took place. The initiation of EHR by the providers competed for time and attention and may have decreased attention to the new practice changes.

Since charts were only reviewed once at the end of the project period, in agreement with the IRB protocol, there was no baseline data of quality measures documentation collected prior to the beginning of the project and charts were not reviewed on a regular basis during the project. There was no clear distinction between new and returning patients or families and many of the patient numbers were too small to conduct statistical analyses. As the infrastructure was improved and staff education was provided regarding pediatric guidelines during the two years prior to Phase 2, there was a gradual use of aspects of the updated WCPH visit format. The presence of the proper equipment, tools and knowledge may have improved the quality measures in the Phase 1 outcome measures.

Implications for the Future

Positive provider and staff feedback has encouraged RHC staff to sustain the strategies from the OBQI project. Alternatives to mailing reminders are being explored. When a WCPH is finished, parents are encouraged to make the next age appropriate appointment and asked for

their preferred method of reminder. Patient contact information is updated at the time of the visits. Options within the EHR are being explored so staff can send visit reminders in the patient preferred method. The RHC does not have the ability to have parents fill out the developmental screening tools electronically prior to WCPH visit but this approach is being explored.

The RHC staff are also looking at other strategies to improve the pediatric care. One such area is culturally competent care. As the mix of cultures changes in the United States including the rural areas, all health care professionals must be sensitive to the cultural views of health, illness, and treatment approaches (Gobble, 2009). The RHC sees several non-English speaking Hispanic and German-Mennonite families. Due to language barriers both during the visit as well as with written materials, satisfaction may be less in the minority groups of parents (Grinberg, 2011). The clinic staff plans to review various options, including translated printed materials and interpretive services, to address the diversity in the community and provide responsive care.

Through a congressional oversight, the RHC is not currently eligible for meaningful use incentives from use of EHR because of the rural health clinic status (Porter, 2011). The clinic will be poised to receive the incentives when the oversight is corrected due to the improvement in office-based practice and documentation and the use of the EHR for WCPH visits.

This Midwest state in which the RHC is located will be moving forward towards a managed care model for the Medicaid population in 2014. This will potentially increase the number of parents seeking care for their children. There is a further emphasis on the medical home model that includes access to quality care that is continuous and comprehensive and promotes preventive health and care coordination (Hagan et al., 2008). The OBQI project demonstrates the importance of a medical home model for children and has implications for expansion to the adult population.

The evaluation of the OBQI project at the RHC has shown that practice changes and public education can improve the use of pediatric preventive care. Collaborative approaches are being explored with the LHD and RHC staff on options to provide county supported immunizations and WCPH visits by the RHC on the same day, in the RHC community. Ongoing discussion includes issues such as billing for the WCPH visit and the vaccines as well as vaccine transport and storage. It is hoped that the joint effort between primary care and public health will result in the full service of care, accessed closer to home.

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