# Improving Delivery of Bright Futures Preventive Services at the 9- and 24-Month Well Child Visit

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# abstract

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Dr Duncan helped in all aspects of the design, practice recruitment, and selection, learning session and follow-up call content, and recruitment of other learning session faculty. She reviewed data for improvement, wrote the first draft of the manuscript with Ms Pirretti, and did the 2 revisions with input from the other authors; Ms Pirretti had a leadership role in the project conceptualization, design, and implementation. She worked with Ms Healy to support the implementation, practice recruitment and selection, design and implementation of the learning sessions, and follow-up calls. Ms Pirretti performed the data analysis and worked with Dr Duncan to write and revise the manuscript; Dr Earls participated in the concept and design, helped design the details of the intervention and practice selection criteria, helped with the selection, participated as faculty for the learning sessions and follow-up monthly phone calls, reviewed data, suggested additional analyses, and reviewed and revised the manuscript; Dr Stratbucker helped design the details of the intervention and practice selection criteria, helped with the recruitment of continuity clinics and the selection of all participants, participated as faculty for the learning sessions and follow-up monthly phone calls, reviewed practice data, and critically reviewed the manuscript; Ms Healy was involved in project conceptualization and design, taking a leadership role with Ms Pirretti in the implementation of the practice recruitment and selection, and the design and implementation of the learning sessions and follow-up calls. She interacted with the practices individually at many points for data collection and improvement consultation. She reviewed and revised the manuscript, making several significant additions for tables; Dr Shaw contributed to the conceptualization and design of the study, participated as faculty at the first learning session, and reviewed the manuscript with

**OBJECTIVES:** To determine if clinicians and staff from 21 diverse primary care practice settings could implement the 2008 Bright Futures Guidelines for Health Supervision of Infants, Children, and Adolescents, 3rd edition recommendations, at the 9- and 24-month preventive services visits.

METHODS: Twenty-two practice settings from 15 states were selected from 51 applicants to participate in the Preventive Services Improvement Project (PreSIP). Practices participated in a 9-month modified Breakthrough Series Collaborative from January to November 2011. Outcome measures reflect whether the 17 components of Bright Futures recommendations were performed at the 9- and 24-month visits for at least 85% of visits. Additional measures identified which office systems were in place before and after the collaborative.

**RESULTS:** There was a statistically significant increase for all 17 measures. Overall participating practices achieved an 85% completion rate for the preventive services measures except for discussion of parental strengths, which was reported in 70% of the charts. The preventive services score, a summary score for all the chart audit measures, increased significantly for both the 9-month (7 measures) and 24-month visits (8 measures).

**CONCLUSIONS:** Clinicians and staff from various practice settings were able to implement the majority of the Bright Futures recommended preventive services at the 9- and 24-month visits at a high level after participation in a 9-month modified Breakthrough Series collaborative.

The Bright Futures Guidelines for Health Supervision of Infants, Children, and Adolescents, 3rd edition1 (Bright Futures) published in 2008 is a uniform set of guidance to assist clinicians in pediatric preventive care, containing recommended preventive services for US infants, children, adolescents, and young adults from birth to age 21 years. These guidelines are recognized as "the evidenceinformed preventive care and screenings provided for in the comprehensive guidelines supported by the Health Resources and Services Administration for purposes of coverage without co-pay" under

Section 2713 of the Public Health Service (PHS) Act, as amended by the Affordable Care Act.<sup>2</sup>

Studies document that 'development and publication of guidelines alone do not translate into improved care.<sup>3</sup> Practical tools and strategies have been identified as important components to assist clinicians in making change in clinical settings.<sup>4,5</sup> Evidence shows that change requires focus on the system being impacted, not just on the individual practitioner. This means that the team of providers and staff needs to be engaged.<sup>6,7</sup> One major tool for system change has been the quality collaborative, a group of practices or

hospitals, meeting over a defined timeframe to effect the specific change targeted for improving care.<sup>8–13</sup>

A natural extension of the collaborative model is an organized network of providers or institutions engaging its members in topic-specific collaboratives. In 2005, the American Academy of Pediatrics (AAP) developed the Quality Improvement Innovation Networks (QuIIN) to organize a platform of practices for testing "change packages" of new measures, guidelines of care, and innovative care delivery approaches before widespread dissemination. The AAP's Bright Futures Initiative partnered with QuIIN to conduct the Preventive Services Improvement Project (PreSIP). A third project partner, the Academic Pediatric Association's Continuity Research Network, contributed expertise and recruitment of 4 residency continuity clinics. The PreSIP's aim was to assist practices in making office systemsbased changes to implement the 15 screening and anticipatory guidance recommendations from Bright Futures Guidelines for Health Supervision of Infants, Children, and Adolescents, 3rd edition. The hypothesis was that practices would perform each service at least 85% of the time during 9- and 24-month preventive services visits as a result of PreSIP participation.

## **METHODS**

#### **Team Selection and Characteristics**

Pediatric primary care practices were recruited through the AAP QuIIN and the Academic Pediatric Association's Continuity Research Network. Applicants were told that Maintenance of Certification (MOC) Part 4 had been applied for, but was not assured. Applicant practices provided information on their location, size, practice type, practice setting, patient population, and experience with quality improvement (QI), and identified a 3-member physician-led core improvement team.

Twenty-two pediatric primary care practices from 15 states were selected from 51 applicants to participate in a QI project focused on implementing Bright Futures in practice. Practices were selected to represent diversity in practice types, practice settings, and patient populations. In each selected practice the lead core team physician and in some cases the whole practice had previous QI experience. Before the intervention, 1 practice declined participation owing to local institutional review board challenges; 2 months before the project's end date, another practice withdrew owing to core team members' change in employment locations, however, this team provided final system level data at the time of withdrawal and is considered in the system level analysis. Table 1 summarizes practice characteristics for the 21 project teams.

#### Intervention

An intervention was designed to support the 21 pediatric teams' efforts to implement Bright Futures recommendations at the 9- and 24month preventive services visits. Project faculty, staff, and practice participants discussed how to change current preventive services delivery by using a modified Breakthrough Series (BTS) collaborative model.<sup>14</sup> The BTS Collaborative intervention model includes 3-day conferences (learning sessions), with "action periods" between sessions during which participants improve their practice settings by using Plan-Do-Study-Act cycles and selfmeasurement. Participants have monthly coaching phone calls with project staff to review data, discuss progress, and brainstorm solutions to challenges. This approach uses a 3person practice team, which could include a physician, nurse practitioner, office nurse, practice support person, or business manager, who attend all learning sessions. Teams bring information back to their practices and lead practice

participation in monthly data collection, run charts review, and allpractice phone calls. Teams work with the rest of the practice to plan, initiate, and study the practice-wide systems change efforts. PreSIP used a modified version of the BTS lasting 9 months, with 2 instead of 3 learning sessions. Learning session 1 was attended by teams from all 21 practices, and learning session 2 at month 10 was attended by teams from 20 practices. Teams exchanged ideas at the learning sessions, on monthly phone calls, and by E-mail and listserv with faculty and each other about improvement strategies. At the second session, teams discussed in detail the successful strategies used as well as challenges and opportunities to maintain gains and continue progress on goals not yet accomplished. This project received AAP Institutional Review Board approval and American Board of Pediatrics approval for 25 points toward Maintenance of Certification, Part 4.

**TABLE 1** Practice Characteristics (n = 21)

Characteristic	n
Practice type	
Private practice	12
Continuity clinic	4
Community health center	3
Indian health service	2
Practice setting <sup>a</sup>	
Urban (inner city)	5
Urban (non-inner city)	8
Suburban	3
Rural	5
Practice size (primary care providers)	
<b>≤</b> 5	6
6 to 10	9
>10	6
Patient characteristics	
Patient majority (≥50%)	
Hispanic	7
African American	3
White	6
Native American	2
No majority	3
Practice uses EHR	
Yes	18
No	3

<sup>&</sup>lt;sup>a</sup> All practice settings had at least 1 private practice

Measures Denominator Numerator 9- and 24-Month Health Supervision Visits % Patients with documentation in chart that # Patients age 9 and 24 months with documentation All patients age 9 and 24 months in practice for parental concerns were actively elicited at most in chart that were asked about parental concerns health supervision care whose charts are recent visit reviewed % Patients with documentation in chart that at # Patients age 9 and 24 months with documentation All patients age 9 and 24 months seen in practice for least 2 parental concerns were addressed at in chart that at least 2 parental concerns were health supervision care with a documented the most recent visit parental concern whose charts are reviewed % Patients who have documentation in chart that # Patients age 9 and 24 months with documentation All patients age 9 and 24 months seen in practice for age-appropriate risk assessments were in chart that age-appropriate risk assessments health supervision care whose charts are performed at the most recent visit reviewed were performed % At-risk patients, as identified by risk # Patients age 9 and 24 months with documentation All patients with documented risk, age 9 and 24 assessment, with documentation in chart that in chart that age-appropriate risks were months, seen in practice for health supervision risks were addressed at the most recent visit care whose charts are reviewed % Patients who have documentation in chart that # Patients age 9 and 24 months with documentation All patients age 9 and 24 months seen in practice for at least 3 of the Bright Futures priorities were in chart that at least 3 Bright Futures priorities health supervision care whose charts are discussed at the most recent visit were discussed reviewed % Patients who have documentation in chart that # Patients age 9 and 24 months with documentation All patients age 9 and 24 months seen in practice for parental strengths was discussed at the most in chart that parental strengths was discussed health supervision care whose charts are recent visit reviewed All patients seen for their 9- or 24-month health % Patients who have documentation of 1 # Patients seen at their 9- or 24-month health supervision visit with documentation in chart of 1 supervision visit whose charts are reviewed completed standardized developmental screen at their 9- or 24-month health supervision visit completed standardized developmental screen at the 9- or 24-month visit % Patients with a positive developmental screen # Patients age 9 or 24 months with a positive All patients with a positive developmental screen, who have documentation of follow-up plan in developmental screen that have documentation in age 9 or 24 months, seen in practice for health chart of a follow-up plan supervision care whose charts are reviewed chart Additional measure only included in the 9-month health supervision visit chart review % Patients who have documentation in chart that # Patients with documentation in chart that weight All patients seen in practice for 9-month health weight for length was measured and plotted on for length was measured and plotted at the 9supervision visit whose charts are reviewed the percentile curves according to age and month health supervision visit % patients with documentation that oral health # Patients with documentation in chart of 1 oral All patients seen in practice for the 9-month health risk assessment was completed at 9-month health risk assessment at the 9-month health supervision visit whose charts are reviewed supervision visit visit Additional measure only included in the 24-month health supervision visit chart review % Patients who have documentation in chart that # Patients with documentation in chart that BMI was All patients seen in practice for 24-month health BMI was measured and plotted on the measured and plotted at the 24-month health supervision visit whose charts are reviewed percentile curves according to age and gender supervision visit % Patients with documentation of 1 completed # Patients with documentation in chart of 1 autism- All patients seen in practice for the 24-month health standardized autism specific screening at the specific screen at the 24-month visit supervision visit whose charts are reviewed 24-month visit % Patients with a positive autism screen who have # Patients seen for a 24-month health supervision All patients with a positive autism screen seen in documentation of follow-up plan in chart visit with a positive autism screen that have practice for a 24-month health supervision visit documentation in chart of a follow-up plan whose charts are reviewed % Patients without a dental home that have # Patients with documentation in chart that they do All patients seen in practice for the 24-month health documentation an oral health risk assessment not currently have a dental home and an oral supervision visit whose charts are reviewed was completed at the 24-month visit health risk assessment occurred at the 24-month

# **Measures**

Measurement was designed to assess progress toward the 85% or higher goal for recommended preventive services. A critical step was "translation" of the *Bright Futures Guidelines* and *Bright Futures Tool and Resource Kit* into components measurable through chart audit or

office systems inventory. The project measured a combination of nationally endorsed measures and measures tested in and/or adapted from previous QI preventive services projects.<sup>8,11,12,15-19</sup> Measurements included in the PreSIP are detailed in Table 2. One particularly challenging but critical measurement area was

health supervision visit

the "partnership with parents," a unique and integral component of Bright Futures not reflected in adult practice guidelines. Two chart audit measures (asking about and addressing parental concerns and identification of parent strengths) and 1 office-based systems measure (shared decision-making) were used.

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To determine the pre- and postpreventive services score (PSS) for a practice, the number of recommended preventive services (7 for 9-month-old children and 8 for 24month-old children) that each patient received were summed. These were then averaged to provide a practice PSS at baseline (time 1) and completion (time 2). The PSS for all practices was determined by calculating an average score from all PreSIP patients at time 1 and time 2. Over 9 months, the project measured practice teams' care processes and tested improvement changes to health supervision care processes in 3 areas:

- Newer Screening Recommendations: oral health risk assessment and developmental and autism screening
- 2. Additional Health Supervision Care: anticipatory guidance, ageappropriate risk assessment, assessment of parental strengths and eliciting parent concerns, weight for length, and BMI percentile based on age and gender
- 3. Office-Based Changes: recall/reminder system, referral tracking, identification of children who have special health care needs, linkages to community resources (organized list and someone to update the list), shared decision-making/motivational interviewing, use of a preventive prompting system, system to screen for maternal depression, and collection and use of family feedback

Each practice was required to review 20 charts at baseline and completion for both the 9- and 24-month visits, and 10 charts monthly during the 9-month action period for both the 9- and 24month visits. A  $\chi^2$  test was used to evaluate any changes between patients and within the participating practices. A P < .05 was used to test for significance. Participants were queried about the existence of key office systems at baseline and post intervention. Maternal depression screening was measured as a system issue at month 2 and in the post-chart audit. One balancing measure, length of visit, was included.<sup>20</sup> Data were also collected on the monthly reports and during the second learning session about both barriers and successful strategies.

#### **RESULTS**

With all patients included, there were statistically significant increases in all measures between pre- and postintervention measurement (Table 3, Figs 1 and 2). The PSS increased significantly for both the 9- and 24month visits (Table 3). Table 4 illustrates which systems were implemented at baseline and post intervention. Some support the improvement in chart audit data (eg, the preventive services prompting system to remind clinicians and office staff to do each screen, and systems to ensure that all positive screens were followed appropriately). Recall and reminder systems impact both immunizations and appropriate periodicity of visits. (These Health Care Effectiveness Data and Information Set (HEDIS) measures were not included in the chart audit, as practices already have immunization audit information from health plan and public health audits, and improvements in visit periodicity are not well reflected in

a monthly audit measure.) In addition, a system for maternal depression screening was reported by 8 practices at month 2 and 64% of 9-month charts post-intervention included a completed maternal depression screen. In Fig 3 A, B, C, and D, summary run charts demonstrate 3 different patterns. On some measures, practices:

- started high and remained high (eg, anticipatory guidance, weight for length, eliciting parent concerns);
- improved early in the collaborative and stayed high (eg, developmental screening); and
- made incremental progress across the 10-month period (eg, autism screening, assessments of parental strengths, medical risk, and oral health risk). This may reflect a longer or more challenging startup or a preventive service only addressed later in the collaborative.

The PSS summary measure for each practice for 24-month-old children is presented in Fig 4, indicating a numeric increase in the number of provided preventive services for most practices. The barriers mentioned by practices on the monthly reports were categorized, and the number of times each barrier was mentioned by

**TABLE 3** Bright Futures Preventive Service Improvement Project: Changes From Baseline to Project Completion in Chart Audit Measures

Bright Futures Preventive Service Performed	Baseline	Follow-Up	P value
Age 9 months, mean %			
Parental concerns	85	99	0.001
Medical risk assessment/screening	54	91	0.001
Weight for length percentile by age/gender	84	91	0.03
Developmental screen	55	89	0.001
Anticipatory guidance <sup>a</sup>	75	98	0.001
Parental strengths	10	70	0.001
Oral health risk assessment	32	87	0.001
Bright Futures PSS <sup>a</sup>	3.99	6.22	0.001
Age 2 years, mean %			
Parental concerns	81	99	0.001
Medical risk assessment/screening	45	86	0.001
BMI percentile by age/gender	80	98	0.001
Developmental screen	69	90	0.001
Autism screen	55	86	0.001
Anticipatory guidance	80	97	0.001
Parental strengths	12	70	0.001
Dental home/oral health risk	59	88	0.001
Bright Futures PSS <sup>a</sup>	4.74	7.23	0.001

<sup>&</sup>lt;sup>a</sup> Bright Futures PSS is a summed score of all preventive services; each service is a value of 1 and each chart received a summative score of 0 to 7 for 9-mo visit and 0 to 8 for 24-mo visit at baseline and completion.

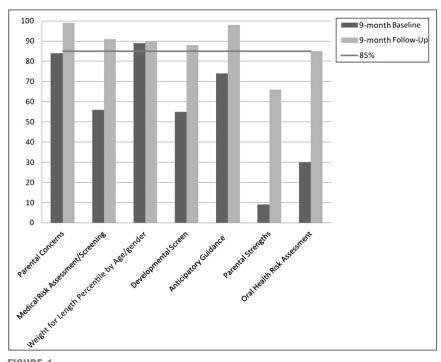


FIGURE 1
Baseline and follow-up data for the 9-month visit. The goal was to achieve 85% completion by project end.

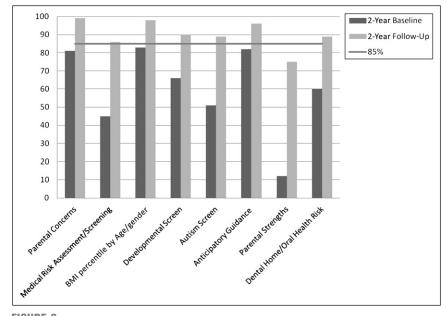
a practice in the monthly report is in parentheses in Table 5.

## DISCUSSION

The major question is simple: can Bright Futures actually be done in a real life busy practice? With coaching from faculty, staff, and each other, these practices were able to implement the majority of Bright Futures at the selected ages.

# **Lessons From PreSIP**

During monthly calls, individual coaching calls, and the second learning session, participants were



**FIGURE 2**Baseline and follow-up data for the 24-month visit. The goal was to achieve 85% completion by project end.

asked to share strategies and practice characteristics that facilitated their success or posed barriers. Several themes emerged that can inform future implementation efforts. The implementation of all recommended preventive services in 1 project was an advantage, giving practices an opportunity to make the practice-wide changes necessary to address all screening items rather than focusing on a single screening at a time, each for a 9-month period. One of the most effective strategies for incorporating new screenings and risk assessment questions into the preventive services visit was a pre-visit questionnaire. Previous studies on the use of pre-visit questionnaires have demonstrated positive results, for example, helping to set the visit agenda,<sup>21</sup> implementing screening in the waiting room,22 and improving parents' acquisition of needed anticipatory guidance.<sup>23</sup> Bright Futures pre-visit questionnaires<sup>24</sup> captured medical/oral health risk screening information and parental concerns/questions. Formal parental screening tools for development, autism, and maternal depression were efficient. The practice managers, nurses, and support staff were critical in designing a pre-visit workflow that was specific for their particular office setting. The use of paper or electronic versions with home or office completion was determined by the practices based on their setting and patient population, proactively addressing literacy/language concerns. Arrival time was scheduled 15 minutes before the visit to allow for questionnaire completion. Questionnaire preparation, distribution, and collection were standardized and questionnaire completion and scoring mechanisms were identified. Templates in electronic or paper format functioned as a prompt for practitioners and staff and a site to document completion of the appropriate screenings, risk assessment, and anticipatory guidance. When Bright Futures was incorporated into an electronic health

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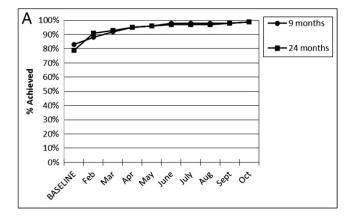
 TABLE 4
 Practice-Level System Changes From Baseline to Completion

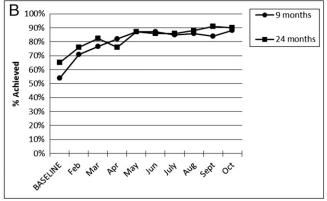
Measure Name	Baseline	Completion	P value $P < .05$
Prompt preventive services	11/21	16/21	0.096
Accessible community resources	9/21	16/21	0.02*
Person responsible for updating resources	8/21	14/21	0.01*
Track referrals	14/21	17/21	0.08
Contact families behind on preventive services	7/21	16/21	0.004*
Learns from family feedback	15/21	18/21	0.24
Uses motivational interviewing or shared decision-making	14/21	18/21	0.21
Identify children with special health care needs	9/21	15/21	0.03*

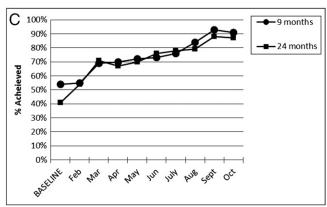
record, reported reliability of implementation increased dramatically. Practice size and information technology (IT) support impacted implementation. Smaller or independent practices have fewer resources, but could easily change or add templates, forms, and pre-visit questionnaires, especially with inpractice Electronic Health Record (EHR) expertise. Large health care systems enjoy IT and data expertise,

but can face layers of decision-making and permissions to effect change. Teaching clinics with many practitioners find standardized EHR templates important for consistent change implementation. Referral and follow-up systems for developmental/dental/community services and mental health were critical. Three examples of strategies 1 or more practices found useful were: (1) selection of a practice/clinic care

coordinator to manage relations with community and organizational resources and update accessible resource lists for parents, (2) hosting a practice "mixer" with community resources for relationship-building, and (3) co-location of a behavioral and/or developmental specialist, if needed. Full-practice team buy-in was sometimes challenging. Practice-wide sessions reinforcing the impact of each person's effort and contribution were important. Many practices used chart audit data to demonstrate gaps, progress, and improvements. Some compared their practice to other sites and assessed improved patient care, as well as possible or real fiscal impact. Most had a few people try a screening tool and testify that it was effective and doable. Practices with a larger number of providers, such as teaching continuity clinics, benefited from







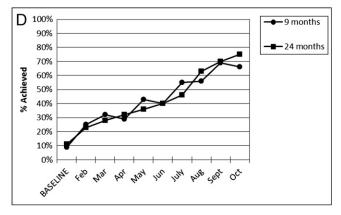
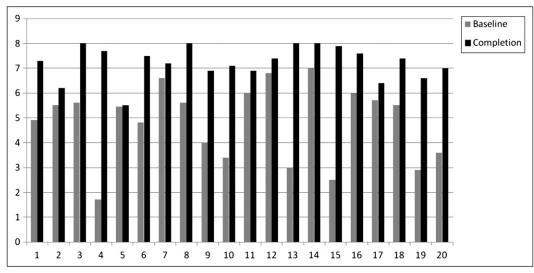


FIGURE 3

A, The proportion of charts with documentation of parental concern elicitation at the 9- and 24-month visits over time. B, The proportion of charts with documentation of developmental screening at the 9- and 24-month visits over time. C, The proportion of charts with documentation of age-appropriate risk assessment at the 9- and 24-months visit over time. D, The proportion of charts with documentation of parental strengths at the 9- and 24-month visits over time.



**FIGURE 4**Average PSS for the 24-month preventive visits at baseline and completion by practice.

multiple reinforcement sessions and by involving resident providers in the improvement process. These suggestions from PreSIP teams, the barriers list, and summary run charts can provide practices interested in implementing Bright Futures with ideas about areas they might want to address first, what problems they

TABLE 5 Reported Barriers to Implementing Change From Monthly Progress Reports Based on the Number of Times Mentioned in Monthly Progress Reports

Staff and physician buy-in, resistance, hesitation (17)

Health IT/electronic medical records (17)

Modifications to EHR (12)

Finding a place to document (3)

Inconsistency with what is reported or populated (1)

EHR upgrades taking place during project (1) Time (16)

The actual patient-visit (7)

Competing priorities (ie, school visits) (5) To do QI work (3)

To develop systems for preventive care (1) Staffing issues (10)

Continuous training and education (5)

Turnover (3)

Vacations (2)

Lack of established systems/processes/policies (8)

Family participation (5)

Literacy levels (3)

Concern with sharing personal information (particularly for immigrant families) (1) Overwhelming amount of information provided (1) might anticipate, and practice-tested strategies to consider.

# Special Considerations: Parental Strengths, Maternal Depression Screening, and Visit Time

The greatest implementation challenge was the strengths assessment and feedback to parents. Although this is the only chart audit measure not achieving the 85% benchmark, it showed the largest percentage increase of any measure. First learning session discussions revealed that practices had already been identifying and acknowledging parental strengths in an informal but inconsistent manner. This project gave intentional focus to this important aspect of family functioning. Entire practice team participation in identifying what parents did well helped formalize this component, by asking parents whom they have for support and what they like to do with their child, taking an interest in their lives, and/or recognizing the strength of extended family. Some practitioners felt this personal "non-mechanical" interaction enhanced relational access, dovetailing with shared decision-making if change was needed. An important consideration in QI interventions is inclusion of a balancing measure. The Institute for Healthcare Improvement (IHI) defines this as a measure that

"looks at a system from different directions or dimensions to see what happened to the system as we improved the outcome."20 This study measured visit time and found that comprehensive Bright Futures implementation did not result in a longer 2-year visit, but did show a slight increase (<3 minutes) for the 9-month visit. The large SD (12.33) indicated substantial visit time variation among practices. There was no easily identifiable association of visit time with practice type or results achieved. Further study would be needed to identify any correlates of increased visit time.

## **Limitations**

A small number of charts were audited with non-probability sampling, consistent with the rapid-cycle change aspect of the "model for improvement." When applied in practice improvement, even this small number of charts allowed participants to quickly determine, using a plan-do-study-act approach, if their efforts that month had been effective. Participants were encouraged to test innovations for effectiveness and to make immediate modifications if needed. Our methods examined only preventive services visit screening and counseling, not those done at acute or other "non-well" visits, potentially underestimating total

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screening and counseling. With no comparison group, improvements over the 9-month study period may be attributable to factors other than this intervention; however, feedback received during the collaborative and at the second learning session indicated that changes were likely attributable to the practice efforts promoted by this intervention. Emphasis was placed on the importance of continued monitoring of progress and sustainability. As in most QI measurement studies, outcomes were measured based on practice self-audit, and practices were encouraged to use paper or electronic templates, which may have resulted in improved documentation of care. Independent chart audit, patient report of visit components, or recorded visits would have added more rigor to measurements,25 but these were outside the logistical and financial scope of this project. These limitations precluded direct parental assessment of the visit experience and utility of care. Parental experience is an important component of care and, along with impact on parent behaviors and children's health, should be assessed in future studies. Finally, can this intervention be generalized to other practices nationally? Diverse practice settings were selected to generate the broadest set of strategies and tools that supported improvement in preventive services delivery.

Although several approaches worked well for most settings, the limited number of practices did not permit specifying which strategies were most effective for each type of practice. Future research should address this issue so that such specific strategies can be coordinated with practice type for practices beginning implementation. Each PreSIP practice had at least 1 person with QI experience, and was presumably already motivated to improve preventive services. These results are likely to be generally reproducible, as practitioners are becoming increasingly familiar with QI approaches through participation in MOC Part 4. In the near future, MOC requirements could function as an incentive for measurable Bright Futures implementation. This QI project tested the feasibility of using a modified BTS methodology to increase provision of preventive services for children birth to age 3 years. The strategies and tools identified could be helpful to a wide variety of practice settings. Future studies should include parental input as well as a sufficient number of practices to allow correlating successful approaches with practice setting type.

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### **REFERENCES**

- Hagan JF, Shaw JS, Duncan PM, eds. Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, 3rd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2008
- Patient Protection and Affordable Care Act, Pub. L. No. 111-148, §2702, 124 Stat. 119, 318-319 (2010)
- Institute of Medicine. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, DC: National Academy Press; 2001
- Bodenheimer T, Grumbach K. Improving Primary Care: Strategies and Tools for a Better Practice. New York, NY: McGraw Hill Medical; 2006
- Bobiak SN, Zyzanski SJ, Ruhe MC, et al. Measuring practice capacity for change: a tool for guiding quality improvement in primary care settings. *Qual Manag Health Care*. 2009;18(4):278–284
- Nutting PA, Crabtree BF, Miller WL, Stange KC, Stewart E, Jaén C. Transforming physician practices to patient-centered medical homes: lessons from the national demonstration project. *Health Aff (Millwood)*. 2011;30(3):439–445
- Coleman K, Mattke S, Perrault PJ, Wagner EH. Untangling practice redesign from disease management: how do we best care for the chronically ill? *Annu* Rev Public Health. 2009;30:385–408
- Shaw JS, Wasserman RC, Barry S, et al. Statewide quality improvement outreach improves preventive services for young children. *Pediatrics*. 2006;118(4). Available at: www.pediatrics.org/cgi/ content/full/118/4/e1039
- Young PC, Glade GB, Stoddard GJ, Norlin C. Evaluation of a learning collaborative to improve the delivery of preventive services by pediatric practices. *Pediatrics*. 2006;117(5):1469–1476
- Margolis PA, McLearn KT, Earls MF, et al. Assisting primary care practices in using office systems to promote early childhood development. *Ambul Pediatr*: 2008;8(6):383—387
- 11. Lannon CM, Flower K, Duncan P, Moore KS, Stuart J, Bassewitz J. The Bright

- Futures Training Intervention Project: implementing systems to support preventive and developmental services in practice. *Pediatrics*. 2008;122(1). Available at: www.pediatrics.org/cgi/content/full/122/1/e163
- King TM, Tandon SD, Macias MM, et al. Implementing developmental screening and referrals: lessons learned from a national project. *Pediatrics*. 2010;125 (2):350–360
- Duncan P, Frankowski B, Carey P, et al. Improvement in adolescent screening and counseling rates for risk behaviors and developmental tasks *Pediatrics*. 2012;130(5). Available at: www.pediatrics. org/cgi/content/full/130/5/e1345
- 14. Institute for Healthcare Improvement. The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement. IHI Innovation Series white paper. Boston, MA: Institute for Healthcare Improvement; 2003
- 15. Bethell C, Peck C, Abrams M, Halfon N, Sareen H, Scott-Collins K. Partnering with parents to promote the healthy development of young children enrolled in Medicaid. Commonwealth Fund Report 2002. Available at: www. commonwealthfund.org/publications/fund-reports/2002/sep/partnering-with-parents-to-promote-the-healthy-development-of-young-children-enrolled-in-medicaid. Accessed January 3, 2014
- 16. Bethell C, Reuland CH, Halfon N, Schor EL. Measuring the quality of preventive and developmental services for young children: national estimates and patterns of clinicians' performance. Pediatrics. 2004;113(6 suppl):1973–1983
- 17. National Committee for Quality Assurance. Weight Assessment and Counseling for Nutrition and Physical Activity for Children/Adolescents (WCC) NCQA website. Available at: www.ncqa. org/portals/0/Weight%20Assessment% 20and%20Counseling.pdf. Accessed October 1, 2014
- 18. Abatemarco DJ, Gubernick R. Practicing safety: a child abuse and neglect

- prevention improvement project. Final Data Analysis Report. August 2010. Unpublished data. Available at: www.aap.org/en-us/professional-resources/practice-support/quality-improvement/Quality-Improvement-Innovation-Networks/Pages/Practicing-Safety-A-Child-Abuse-and-Neglect-Prevention-Improvement-Project.aspx. Accessed January 3, 2014
- 19. O'Connor K, Boulter S, Keels M, Krol DM, Lewis C, Mouradian WE. Oral health screening among pediatricians: a national survey. Presented at the June 2009 Academy Health Child Health Annual Meeting. Available at: http://www. aap.org/en-us/professional-resources/ Research/Documents/ps70pas09\_ OralHealth.pdf. Accessed October 1, 2014
- Institute for Healthcare Improvement. How to improve. Available at: www.ihi. org/resources/Pages/HowtoImprove/ ScienceofImprovementEstablishingMeasures. aspx. Accessed October 1, 2014
- Fothergill KE, Gadomski A, Solomon BS, et al. Assessing the impact of a webbased comprehensive somatic and mental health screening tool in pediatric primary care. Acad Pediatr. 2013;13(4): 340–347
- 22. Anand V, Carroll AE, Downs SM.
  Automated primary care screening in pediatric waiting rooms. *Pediatrics*. 2012;129(5). Available at: www.pediatrics.org/cgi/content/full/129/5/e1275
- Bethell C. Patient-centered quality improvement of well child care. Available at: www.mchlibrary.info/ MCHBfinalreports/docs/R40MC08959.pdf. Accessed October 1, 2014
- Duncan P, Shaw J, Gottesman MM, Swanson J, Hagan J, Pirretti J. A Bright Futures Tool and Resource Kit. Elk Grove Village, IL: American Academy of Pediatrics; 2009
- Bethell C, Klein J, Peck C. Assessing health system provision of adolescent preventive services: the Young Adult Health Care Survey. *Med Care*. 2001; 39(5):478–490

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