

## Assuring Better Child Health and Development



### Goals

The goals of the Assuring Better Child Health and Development (ABCD) program are: 1) to make certain that all children receive appropriate developmental screenings and referrals and 2) to increase the likelihood that medical professionals will conduct developmental screenings and make these referrals.

### Program Features

ABCD is an intervention in primary-care physician offices. The project's purpose is to assist medical professionals in implementing an efficient and practical process for screening to promote early identification and referral and to facilitate primary care physicians' ability to link to early intervention and other community services.

To achieve this purpose, an ABCD staff person provides technical assistance and/or support to medical providers regarding their use of standardized, validated, developmental and behavioral screening tools. Providers are encouraged to conduct a formal screening using the *Ages and Stages Questionnaire (ASQ)* or the *Parents' Evaluation of Developmental Status (PEDS)*. Screenings should be performed at the 6-, 12-, and 18-month or 24-, 36-, 48-, and 60-month visits.

The ABCD staff person also works with medical providers to ensure they are connected with the local Children's Developmental Services Agency (CDSA) office and school system to facilitate making referrals to these locations for in-depth assessment when the screening they conduct indicates a possible developmental delay. The CDSA and the school system are both funded to serve children through the Individuals with Disabilities Act (IDEA). The CDSA serves children birth to two (IDEA Part C) and the school system serves those ages three to five (IDEA Part B).

The ABCD staff person trains the medical offices to track screenings, results, referrals, and service receipt in the medical record for each child. The ABCD staff person then conducts periodic chart reviews of a sample of cases to document progress over time. These data are used to inform the ongoing technical assistance to the medical office.

The Assuring Better Child Health and Development Project began in North Carolina in August 2000, by piloting formal developmental screening and surveillance for children receiving Early Periodic

### Assuring Better Child Health and Development (ABCD) Snapshot

- **EC Profile Indicator:** H10 - Percent of children who receive early intervention or special education services
- **Clearinghouse rating:** None
- **Research supports** use with medical professionals serving children ages birth through five
- **Related Smart Start outcomes:**
  - Increase in developmental and/ or autism screenings or assessments performed
  - Increase in referrals of children to services
  - Children increase use of services
- **Training required:** Yes
- **Suggested Assessments:**
  - Chart reviews
- **Implementation Guidance:**  
<http://www.nashp.org/abcd-state/north-carolina>

Screening, Diagnosis, and Treatment (EPSDT) services in pediatric and family practices.

For more information regarding the ABCD project use this link: <http://www.nashp.org/abcd-state/north-carolina>.

## Target Audience

Medical professionals providing pediatric primary care

## Documented Outcomes

	Type of Study	Outcomes		
		Increase in screenings*	Increase in referrals to services*	Improved coordination across system of care
Berry et. al. (2008) <sup>i</sup>	Non-experimental			✓
Germuth (2016) <sup>ii</sup>	Non-experimental with comparison groups	✓	✓	
Hanlon (2013) <sup>iii</sup>	Document review			✓
Kaye & Rosenthal (2008) <sup>iv</sup>	Document review	✓	✓	
Klein & McCarthy (2009) <sup>v</sup>	Non-experimental	✓	✓	
Pelletier & Abrams (2002) <sup>vi</sup>	Non-experimental	✓	✓	
Plaza et.al. (2013) <sup>vii</sup>	Document review	✓	✓	✓

*This table contains outcomes found to be associated with the program or approach. Individual studies may contain additional outcomes that were tested and not found to be associated with the program or approach.*

\*Aligned with Smart Start outcomes *Increase in developmental/autism screenings or assessments performed, Increase in referrals of children to services, or Children increase use of services*

## Research Evidence for Assuring Better Child Health and Development Project

- This program is linked to increases in developmental or autism screening rates for medical professionals and increases in referrals to early intervention programs.

### Review of Experimental and Quasi-Experimental Studies

None

### Review of Meta-Analyses

None

## Review of Descriptive and Non-Experimental Studies

<b>Citation</b>	<b>Berry, C., Krutz, G. S., Langner, B. E., &amp; Budetti, P. (2008). Jump-starting collaboration: The ABCD initiative and the provision of child development services through Medicaid and collaborators. Public Administration Review, May/June, pp. 480-490.</b>
<b>Population and Sample</b>	The study involved 4 states and 150 unique key informants. Key informants included state Medicaid directors, personnel from partner agencies, frontline staff involved in the program, medical and nursing directors, and participating families and providers.
<b>Methodology</b>	Non-experimental
<b>Purpose</b>	A national evaluation of the ABCD program to assess the feasibility and success of providing child development services through Medicaid.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Interviews</li> <li>• Program documents</li> <li>• Observations</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• The evaluation team conducted three annual site visits to each of four states. Key informants included state Medicaid directors, personnel from partner agencies, frontline staff involved in the program, medical and nursing directors, and participating families and providers.</li> <li>• Review of materials related to implementation including documents used for staff recruitment, training, and provider education; information provided for education of program participants; agendas and minutes from meetings; quarterly reports; and materials used for advertising and marketing-related activities.</li> <li>• Conducted observations of home visits and interviews with families.</li> <li>• Successful implementation in the four states studied relied on the ability to identify and build on or integrate into existing programs, collaborations, infrastructure, or strategies.</li> <li>• An important feature of implementation was to plan, pilot, and refine prior to expanding into other sites. Two states (NC and WA) planned from the start to pilot one or more projects or elements of projects, refine them after pilot results, and then gradually expand to other sites. The other two states (VT and UT) initially planned statewide rollout of their programs or components of their programs but moved to a pilot-refine0expand approach in implementation.</li> <li>• The study was not able to quantify the actual delivery of services.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• Not addressed</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• The ABCD initiative inspired cross-agency and cross-disciplinary developments that emerged during the evaluation, specifically, increased interagency cooperation and heightened awareness of and attention to broader models of child development services.</li> <li>• A closely related outcome of the ABCD initiative was noticeably increased attention to child development services beyond the medical model that was observed throughout the four states.</li> </ul>

<b>Citation</b>	<b>Germuth, A. (2016). Evaluation of Smart Start's Race to the Top – Early Learning Challenge: Assuring Better Child Health and Development (ABCD) Project: 3-Year Summary Report. Durham, NC: EvalWorks, LLC.</b>
<b>Population and Sample</b>	The study described the results of the ABCD project, as implemented in 14 Community Care regions in North Carolina between July 2013 and December 2015.
<b>Methodology</b>	Non-experimental with comparison groups
<b>Purpose</b>	The study is a formative and summative evaluation of North Carolina's ABCD program. Focal questions included: <ul style="list-style-type: none"> <li>• To what degree is the RTT-ELC ABCD project achieving outputs and outcomes among participating regions and practices?</li> <li>• What are the key factors related to outcomes?</li> <li>• What are the key components of sustainability?</li> </ul>
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Developmental screenings and referrals</li> <li>• Autism screenings and referrals</li> <li>• Referrals to and receipt of intervention services</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• A focus group was conducted with 12 of the 17 ABCD Coordinators to gather information about the areas medical practices needed the greatest support and what proved most effective in increasing screening and referral rates</li> <li>• Analyses of file chart reviews and tracking form data provided by ABCD Coordinators for July 2013 through December 2015</li> <li>• A phone survey was conducted with 20 of the 36 medical practices identified by ABCD coordinators</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• Not addressed</li> </ul>

<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• Medical practices that worked with ABCD coordinators the longest (Level 3 sites) screened 95.5% of all children birth-5 who were due for screening (10% increase over baseline)</li> <li>• Medical practices that worked with ABCD coordinators the shortest amount of time (Level 1 sites) increased screening rates to 5% above baseline</li> <li>• 77.5% of children in Level 3 sites were referred for follow-up when the ABCD screening suggested a delay or concern, compared to 68% of children at baseline</li> <li>• Level 2 and Level 3 sites referred a higher proportion of possibly at-risk children to appropriate Individuals with Disabilities in Education Act (IDEA) Parts B and C agencies than Level 1 sites.</li> <li>• There was an increase over baseline in the percentage of children who received an expected MCHAT screening (for autism spectrum disorders) at Level 3 sites</li> </ul>
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<b>Citation</b>	<b>Hanlon, C. (2013). Measuring and improving care coordination: Lessons from ABCD III. National Academy for State health Policy.</b>
<b>Population and Sample</b>	Synthesized reports from five ABCD III states (Arkansas, Illinois, Minnesota, Oklahoma, Oregon)
<b>Methodology</b>	Document review
<b>Purpose</b>	Five states piloted and evaluated strategies to improve care coordination among primary care providers (PCPs) and community service providers. This report describes their evaluation methods, summarizes the results, and highlights lessons learned from their experiences evaluating care coordination.
<b>Measures &amp; Assessments</b>	The states relied on two main methods—use of new data tracking tools or claims data analysis coupled with chart review—to measure the common outcome (closed feedback loops between PCPs and early intervention or EI).
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• Collected, reviewed, and synthesized reports from 5 states providing ABCD III, which assessed the progress and impact of piloted interventions to improve care coordination for young, Medicaid-eligible children with or at risk of developmental delays.</li> <li>• Each state agreed to use “closing the feedback loop” as a shared outcome of care coordination which included: PCP referral to local community service provider after identification of patient risk via screening; community service provider follow-up (with referral feedback) to referring PCP; and documentation of referral feedback in the PCP chart or by the PCP (a “closed loop”).</li> <li>• In Illinois and Minnesota, PCPs documented closed loops (referrals made to early intervention (EI) to indicate whether and/or when feedback was received from EI) using new data tracking tools (chart review and an Access database) created for ABCD III.</li> <li>• In Minnesota, participating clinics monitored and reported screening, referral, care coordination, and communication information in the Access database and submitted it to evaluators every six months.</li> <li>• In Oklahoma, PCP offices checked a box in an electronic system acknowledging receipt of referral feedback for a child referred.</li> <li>• In Arkansas and Oregon, Medicaid and/or EI data was used to identify children for whom EI claims were submitted and whose charts should be randomly sampled to identify evidence of PCP receipt of EI referral results.</li> <li>• Oregon had each participating managed care organization pull a sample of continuously enrolled children who turned 1, 2, or 3 years old in the last calendar year and who had a 9, 18, or 24 or 30 month well child visit. They also made modifications within the EI data system to allow tracking of whether EI reported feedback information to referring providers.</li> <li>• In Arkansas, the state’s Quality Improvement Organization developed a chart abstraction tool and led chart review. The Oregon Pediatric Improvement Partnership developed the chart abstraction tool and guidance for collecting and submitting requested data.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• Not addressed</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• By creating and implementing use of standard forms, privacy policies, databases and care coordination logs, all ABCD III states are now able to track referral feedback, which is critical to ongoing efforts to improve care coordination.</li> <li>• Findings suggest that ABCD III states’ improvement strategies (learning collaboratives offering training in quality improvement processes and peer learning opportunities coupled with efforts to bring key community partners together) can improve care coordination for children.</li> <li>• Electronic tracking enhanced both the intervention and the evaluation.</li> <li>• Additional attention is needed to ensure that electronic health record adoption supports rather than hinders quality improvement.</li> <li>• Measuring multiple aspects of the care process—screening, referral and closed feedback loops—enables prioritization of quality improvement efforts.</li> <li>• State policy can facilitate measurement of closed feedback loops and is critical to sustainability.</li> </ul>

<b>Citation</b>	<b>Kaye, N., &amp; Rosenthal, J. (2008). Improving the delivery of health care that supports young children’s healthy mental development: Update on accomplishments and lessons from a five-state consortium. Portland (ME): National Academy for State Health Policy.</b>
<b>Population and Sample</b>	The study incorporated data from five states participating in an ABCD II consortium (California, Illinois, Iowa, Minnesota, and Utah).
<b>Methodology</b>	Non-experimental with comparison groups
<b>Purpose</b>	The study summarized the outcomes and lessons learned from the five states participating in the consortium.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• The percent of children aged 0-3 screened using a standardized tool to identify concerns related to social and emotional development</li> <li>• The percent of children aged 0-3 identified with significant concerns who were referred for services to assess, prevent, or treat those concerns</li> <li>• The percent of children aged 0-3 identified with significant concerns who received follow-up services to assess the need for developmental services, prevent delays, or treat delays, either in the primary care office or elsewhere.</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• Collected, reviewed, and synthesized reports from 5 states providing ABCD II, which assessed system performance, strategies to improve service delivery, and lessons learned.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• Not addressed</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• Screening rates in participating practices increased. In some cases, the screening rates changed from zero to almost 100% of eligible children</li> <li>• The use of multi-dimensional screening tools was associated with increased identification of potential risk for delay (compared to a tool that only screened for socio-emotional concerns)</li> <li>• Referral rates were 2 to 10 percent of children screened</li> </ul> <p>Screenings for Socio-Emotional Delays</p> <ul style="list-style-type: none"> <li>• California: Screenings rates pre: 0% and post: 94% (Pool: Number of children who had a 12-, 18-, or 24-month well-child visit during the intervention period.)</li> <li>• Illinois: Screenings rates pre: about 0% and post: at or above 43% (Pool: Number of children who had a 6-, 9-, 18-, or 24-month well-child visit during the intervention period at the practice-based pilot.)</li> <li>• Iowa: Screenings rates pre: 53% and post: 93% (Pool: Number of children under age 3 who had a well-child visit from one of the pilot practices during the intervention period.)</li> <li>• Minnesota: Screenings rates (urban and rural locations) pre: 0% and post: 93% (Pool: Number of children age birth to five who had a well-child visit and belonged to the intervention group defined by day of appointment or physician.)</li> <li>• Utah: Screenings rates infants pre: 0% and post: 76%; screenings rates toddlers pre: 0% and post: 84% (Pool: Number of children in the target age group who had a well-child visit.)</li> </ul> <p>Referrals</p> <ul style="list-style-type: none"> <li>• California: about 10 percent of the children screened were referred.</li> <li>• Illinois: about 6 percent of the children screened were referred.</li> <li>• Iowa: there was an “overall baseline referral rate of at least 5 percent of the 400 children in the sample and a post-intervention rate of at least 6 percent of the 400 children in the sample.” As regards the social and emotional domain, the baseline referral rate was “about 2 percent of the children who were adequately screened (i.e., screened with either the Iowa Child Health and Development Record (Iowa-CHDR) or a standardized tool) and a post-intervention rate of about 3 percent of the children who were adequately screened.”</li> <li>• Minnesota: the urban practice referral rate was 2% of children who were screened and the rural practice referral rate was 14% of children who were screened.</li> <li>• Utah: about 5 percent of the infants and toddlers screened were referred.</li> </ul>

<b>Citation</b>	<b>Klein and McCarthy (2009). North Carolina’s ABCD Program: Using Community Care Networks to Improve the Delivery of Childhood Developmental Screening and Referral to Early Intervention Services</b>
<b>Population and Sample</b>	The study profiled three community care networks implementing the ABCD program in NC. One served Guilford, Randolph, and Rockingham counties, one served Cumberland County, and one served Harnett, Hoke, Lee, Montgomery, Moore, Richmond, and Scotland counties.
<b>Methodology</b>	Non-experimental

<b>Purpose</b>	The goals of the study were to capture implementation and results data related to the ABCD program.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Interviews</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• Interviews were conducted with local community care network executive and medical directors, project coordinators, a case manager, a physician office manager, the head of the state’s early intervention branch, the exceptional children preschool coordinator the NC Department of Public Instruction, and the leader of a statewide public-private initiative promoting early childhood development.</li> <li>• Varied based on the community and the specific activities, but typically through the relationship developed between the ABCD coordinator and physicians</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• Not addressed</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• In the period 2004 to 2008, the North Carolina ABCD program was associated with: <ul style="list-style-type: none"> <li>○ A quintupling of the number of developmental screenings performed during Well-Child Visits for Medicaid-support children</li> <li>○ A quadrupling of the number of referrals to Early Intervention programs</li> </ul> </li> <li>• Across the three community care networks, “The number of developmental screenings increased nearly twofold to more than six fold,” from 2004 to 2008. The study team also noted that “Changes may not be directly comparable across these networks” and that at one location, a lower screening rate may reflect “the challenges of its rural service area and the fact that its intervention is active in only a subset of its counties.”</li> <li>• Across the state, “the proportion of infants and toddlers who received Early Intervention services reached 4.3 percent in 2008, representing a 43 percent increase from a rate of 3.0 percent in 2003” and “Early Intervention service rates ranged from 3.0 percent to 6.6 percent in 2008 in the counties served by the three profiled CCNC networks.”</li> <li>• Across the state, “In 2006, physicians were responsible for 28 percent of all referrals to the infant-toddler Early Intervention program; by 2008, this proportion had increased to 37 percent.”</li> </ul>

<b>Citation</b>	<b>Pelletier, H., &amp; Abrams, M. (2002). The North Carolina ABCD Project: A new approach for providing developmental services in primary care practice.</b>
<b>Population and Sample</b>	The study tracked program outputs from North Carolina’s implementation of ABCD. The study collected data in Guilford County.
<b>Methodology</b>	Non-experimental
<b>Purpose</b>	The report described North Carolina’s accomplishments and lessons learned from a multi-year demonstration project implementing ABCD.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• The number of children who were screened as a percentage of well-child visits.</li> <li>• The number of children who failed the developmental screen as a percentage of the total number of children screened.</li> <li>• The number and type of referrals as a percentage of the total number of children screened</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• The demonstration project reported data related to the number of children screened as a percentage of well-child visits; the number of children who failed the developmental screen as a percentage of the total number of children screened; and the number and type of referrals as a percentage of the total number of children screened.</li> <li>• The project surveyed parents to learn what they want and what they find most useful in terms of early childhood development services.</li> <li>• A written survey was mailed to physicians, nurses, and other office staff involved in the process for at least six months.</li> <li>• The project developed an office guide to assist physician practices in incorporating the ABCD model that included information on developmental systems, a template for developing work flows and systems, referral forms, member materials, and program data. The guide was adapted to each of six participating physician practices to fit the needs and realities of each site.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• An early intervention specialist held a four-year undergraduate degree in social work with knowledge of developmental disabilities and experience working with families and young children.</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• From 2000 to 2001 (18 months), participating sites completed 3,573 screenings on 3,426 children</li> <li>• Seven percent (n=241) of children screened received a referral. (The state average for referrals to early intervention services was between two to four percent.)</li> <li>• An additional 80 families received support for concerns when the child did not qualify for a referral</li> <li>• The statewide referral rate is approximately 3.9 percent</li> </ul>



- The percentages of children screened (in the fourth quarter of 2000-2001) at the three sites associated with Guilford Child Health varied, “from a high of 72 percent at Devon (a small clinic within a housing project) to 38 percent at Wendover (with ten physicians and nurse practitioners).”
- The total percentage of children screened increased over time: “the total percentage of children screened by GCH grew to 47 percent in the final quarter of 2000-2001, from 5 percent the previous year, and it has continued to rise, to 63 percent in the second quarter of 2001-2002.”

<b>Citation</b>	<b>Plaza, C., Rosenthal, J., &amp; Hinkle, L. (2013). The enduring influence of the Assuring Better Child Health and Development (ABCD) Initiative. National Academy for State Health Policy.</b>
<b>Population and Sample</b>	The study team reviewed the legacy of four ABCD initiatives: ABCD I Consortium (2000-2003); ABCD II (2003-2007), ABCD Screening Academy (2007-2009), and ABCD III (2009-2012).
<b>Methodology</b>	Document review
<b>Purpose</b>	The report provides background information on the program, support associated with the National Academy for State Health Policy, and program results.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Increased identification of children with or at risk for developmental delays</li> <li>• Referral for follow up assessment and services</li> <li>• Improved access to treatment</li> <li>• Coordination across systems that care for young children</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• Collected and reviewed reports from 27 Medicaid programs</li> <li>• Synthesis focused on changes in the identification of children with developmental delays or at risk of delays; referral, information-sharing, and feedback mechanisms; access to follow-up treatment; and care coordination across systems of care.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• Not addressed</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• The program is associated with increased identification of children with or at risk for developmental delays; all but one state saw improvements in screening rates</li> <li>• The program is associated with improved referral, information-sharing, and feedback mechanisms</li> <li>• There is improved access to follow-up services</li> <li>• There is improved coordination across systems of care</li> </ul>

## Review of Screening and Training Interventions Similar to ABCD

<b>Citation</b>	<b>Guevara, J. P., Gerdes, M., Localio, R., Huang, Y. V., Pinto-Martin, J., Minkovitz, C. S., Hsu, D., Kyriakou, L., Baglivo, S., Kavanagh, J., &amp; Pati, S. (2013). Effectiveness of developmental screening in an urban setting. Pediatrics, 131, pp. 30–37.</b>
<b>Population &amp; Sample</b>	The study incorporated 2,103 children under the age of 30 months and more than 36 weeks gestational age from four primary care practices in a large, urban, city. Most participants were African-American with mean family income less than \$30,000. Children were randomly assigned to three groups: (1) developmental screening using Ages and Stages Questionnaire-II (ASQ-II and Modified Checklist for Autism in Toddlers (M-CHAT) with office staff assistance, (2) developmental screening using ASQ-II and M-CHAT without office staff assistance, or (3) developmental surveillance using age-appropriate milestones at well visits.
<b>Methodology</b>	Randomized controlled, parallel-group trial with intention-to-treat analysis
<b>Purpose</b>	The study’s goal was to examine were the percentage of children identified as having developmental delays, referred to EI, and eligible for EI services when developmental screenings were used with a high-risk, urban, population.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Ages and Stages Questionnaire-II (ASQ-II)</li> <li>• Modified Checklist for Autism in Toddlers (M-CHAT)</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• Caregivers completed a questionnaire regarding demographic characteristics and received stratified (by age group) random assignments to one of three groups. Caregivers in the screening groups completed the ASQ-II at child’s 9-, 19-, and 30-month well child visits and the M-CHAT at their 18- and 24-month visits; caregivers in group 1 received staff assistance while those in group 2 received none.</li> <li>• Caregivers in groups 1 and 2 completed age-appropriate developmental milestones at non-screening visits; caregivers in group 3 completed milestones at well-child visits.</li> <li>• Children who failed a screening test or milestone or whose parents had concerns about their development could be referred to EI services at the clinician’s discretion. Referrals occurred through completion and faxing of EI health appraisals/prescriptions or through the provision of EI telephone contacts to parents.</li> </ul>

	<ul style="list-style-type: none"> <li>Electronic decision support was implemented in the screening arms to remind clinicians to complete the ASQ-II at 9-, 18-, and 30-month well-child visits and to complete the M-CHAT at 18- and 24-month visits. Referrals for treatment were made as indicated by screening results.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>Clinicians</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>Children who received screenings (with and without office staff assistance) were more likely than children who received surveillance to be identified with delays, referred to early intervention, and found eligible for early intervention services.</li> <li>Children who received screenings (with and without office staff assistance) were more likely than children who received surveillance to experience a shorter time to identification, early intervention referral, and early intervention evaluation.</li> <li>The study team reported that, overall, 20.9% of patients were identified as having developmental delays. However, there were differences in the likelihood of being identified, based on group. Specifically, among children in group 1 (developmental screening with office support): 23% were identified as having a developmental delay, 19.9% received an early intervention referral, 9.8% completed the referral, and 7% were found to be eligible for early intervention services. Among children in group 2 (developmental screening without office support): 26.8% were identified as having a developmental delay, 17.5% received an early intervention referral, 8.5% completed the referral, and 5.3% were found to be eligible for early intervention services. Among children in group 3 (developmental surveillance only): 13% were identified as having a developmental delay, 10.2% received an early intervention referral, 6% completed the referral, and 3% were found to be eligible for early intervention services.</li> <li>While the overall differences among groups were statistically significant, the differences in the identification of delays between groups 1 and 2 were not statistically significant. As regards the referral of children for follow-up, there were not statistically significant differences between groups 1 and 2. As regards the likelihood of being referred if identified as having delays, there were statistically significant differences between group 1 and the other two groups. Finally, the study team found that “Children in the screening arms were more likely to complete an MDE and be eligible for EI services than children in the DS arm” and “There was no difference (P = .208) between screening arms in EI eligibility. There was no difference in the percentage eligible for services among referred children (OS: 35.0%; NS: 30.5%; DS: 29.6% [P = .15]) or among children who completed an MDE (OS: 71.0%; NS: 62.7%; DS: 50.0% [P = .10]).”</li> </ul>

<b>Citation</b>	<b>Briggs, R. D., Stettler, E. M., Silver, E. J., Schrag, R. D. A., Nayak, M., Chinitz, S., &amp; Racine, A. D. (2012). Social-emotional screening for infants and toddlers in primary care. <i>Pediatrics</i>, 129(2), pp. e377–e384.</b>
<b>Population &amp; Sample</b>	The study involved 3169 children in a prospective cohort design, aged 6 to 36 months. More than 80% of practice patients were either African-American or Hispanic. More than 67% of practice patients were served through subsidized insurance.
<b>Methodology</b>	Quasi-experimental with prospective cohort design
<b>Purpose</b>	The study’s goal was to assess the universal application of the Ages and Stages Questionnaire: Social-Emotional, for screening children ages 6 to 36 months, with follow-up by services for children at or above the risk cutoff score.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>Ages and Stages Questionnaire: Social-Emotional (ASQ:SE)</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>Attempted sequential (every 6 months) social emotional screenings of all children 6 months to 3 years over a 5-year period using the parent completed ASQ:SE. Children who screened above the risk cutoff thresholds were referred for assessment/intervention to the ITS to allow comparison of follow-up scores between those accepting intervention and those declining.</li> </ul>
<b>Implementation Fidelity</b>	<ul style="list-style-type: none"> <li>First, ASQ:SE along with a letter of explanation in English and Spanish reviewing the purpose of the screening was distributed to the family waiting in private exam room. Families could decline or ask for help in completing the questionnaire. Completed questionnaires were returned to the Infant toddler specialist (ITS) during or after the child’s visit. ITS reviewed and scored questionnaires and placed scoring sheet in child’s chart. If scores indicated risk, the ITS offered to complete a more comprehensive assessment. If second assessment indicated the need, the ITS made treatment and referral decisions in consultation with the pediatric provider and either delivered the treatment or closely followed all referrals made. Treatment by the ITS included office- and home-based appointments as needed and was dyadic (caregiver-child) in nature.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>Infant toddler specialist (ITS) mental health specialist co-located within pediatric primary care medical homes</li> </ul>



<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• Of the 3169 children who received a universal screening, 711 (22%) scored at or above the risk cutoff score.</li> <li>• Of the 711 children who scored “at risk”, 170 completed a rescreening. At the time of rescreening, children who received parent-consent follow-up by clinical staff demonstrated significant improvement on ASQ:SE scores, compared to children who declined follow-up services.</li> <li>• Children with identified developmental delays were referred to external treatment for follow-up and were less likely to demonstrate improvement at the time of rescreening.</li> <li>• Children with no or subsidized insurance were more likely to score “at risk” (above the risk cutoff score) than children with private insurance.</li> <li>• Male children had a higher rate of “at risk” scores than female children.</li> </ul>
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<b>Citation</b>	<b>Hix-Small, H., Marks, K., Squires, J., &amp; Nickel, R. (2007). Impact of implementing developmental screening at 12 and 24 months in a pediatric practice. <i>Pediatrics</i>, 120(2), pp. 381-389.</b>
<b>Population &amp; Sample</b>	The study involved 18 pediatricians and 1,428 caregivers and children in two samples: a 12-month and a 24-month sample. Combined, 72% of children were Caucasian, 14% Hispanic; child mean age was approximately 17-18 months. Children with previously identified delays or disorders were excluded.
<b>Methodology</b>	Quasi-experimental drawing upon a convenience sample
<b>Purpose</b>	The purpose of this study was to investigate the effectiveness and costs of incorporating a parent-completed developmental screening tool, the Ages and Stages Questionnaire, into the 12- and 24-month well-child visits under “real world” conditions, using a combined in-office and mail-back data collection protocol.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Ages and Stages Questionnaire</li> <li>• Pediatric Developmental Impression</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• 30 minutes of training were provided for pediatric support staff on ASQ administration and data collection procedures. Receptionists provided parents with study materials at check-in and instructed them to review and complete forms (an introductory letter, consent form, demographic questions, and ASQ with postage paid return envelope). Nurses answered questions and collected completed forms in the examination rooms.</li> <li>• Pediatrician completed the PDI after the well-child visit, blinded to the ASQ results and indicated whether they would make a referral for additional eligibility evaluation.</li> <li>• Pediatricians referred cases according to their usual care procedures. ASQ referrals followed eligibility criteria in the state where the study took place.</li> </ul>
<b>Staff Qualifications</b>	<ul style="list-style-type: none"> <li>• Parents completed Ages and Stages Questionnaire</li> <li>• Trained medical staff administered the Pediatric Developmental Impression.</li> </ul>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• There was a 15% decline in patient volume but an increase of 224% in referral rates in the participating practice. The most notable increase in referrals was at 12 months.</li> <li>• There was an 82% agreement between the Ages and Stages Questionnaire and Pediatric Developmental Impression.</li> <li>• Pediatricians based referrals on assessment of communication and gross motor delays, using the Pediatric Developmental Impression.</li> <li>• There was 68% agreement between delays identified by the Ages and Stages Questionnaire and Pediatric Developmental Impression.</li> <li>• Physician referrals accounted for only 42% of total referrals, highlighting the need for pediatric developmental screening.</li> </ul>

<b>Citation</b>	<b>Schonwald, A., Huntington, N., Chan, E., Risko, W., &amp; Bridgemohan, C. (2009). Routine developmental screening implemented in urban primary care settings: More evidence of feasibility and effectiveness. <i>Pediatrics</i> 123, pp. 660–668.</b>
<b>Population &amp; Sample</b>	Two primary care practices in a large, Northeastern, city. One practice serves approximately 12,000 children, 40% African-American, 35% Latino. Sixty-five percent (65%) of the client base qualifies for Medicaid or free services. The second practice serves approximately 1,800 children, 6% African-American, 54% Latino. Eighty percent (80%) of the client base qualifies for Medicaid or free services.
<b>Methodology</b>	Quasi-experimental
<b>Purpose</b>	The study’s goal was to examine both the feasibility and effectiveness of using the Parent’s Evaluation of Development Status (PEDS) with children ages 6 months to 8 years as an initial screening tool, followed by second-stage screening for those with at least one predictive concern on the PEDS. The study team examined changes in identification rates and referrals.
<b>Measures &amp; Assessments</b>	<ul style="list-style-type: none"> <li>• Initial screening: Parent’s Evaluation of Development Status (PEDS)</li> </ul>

	<ul style="list-style-type: none"> <li>• Second-stage screening: Michigan Scales of Child Development for children less than 2.8 years old; Brigance screens for children 2.9 to 5.9 years old; Wide Range Achievement Test-IV, Vanderbilt Attention Scales, and the Pediatric Symptom Checklist for children 6 to 9 years old</li> </ul>
<b>Study Implementation</b>	<ul style="list-style-type: none"> <li>• Anonymous provider surveys were completed before PEDS training and implementation asking about knowledge, attitudes, and practice related to developmental screening. 40-60 minute PEDS training sessions were then conducted with providers and clinic staff.</li> <li>• Parents completed the 10-item PEDS survey prior to seeing the provider during a well child visit.</li> <li>• If the survey indicated the need for an intermediate level assessment, the second-stage screening (SSS) was conducted by an EI provider using the Michigan Scales of Child Development, which included the Brigance for children 2.9 to 5.9 years of age and the Wide Range Achievement Test-IV, Vanderbilt Attention Scales, and the Pediatric Symptom Checklist for children 6.0-9.0 years of age. Children identified with skills below normed cutoffs were referred for EI services or public school evaluations. Referring primary care providers were informed by email of the SSS findings and whether the child was in need of outside testing.</li> <li>• Providers were instructed to score and respond to the PEDS as recommended in the manual and the scoring algorithm. Clinician judgment was incorporated so that more evaluation was arranged if the clinician was concerned, regardless of the screen.</li> <li>• A focus group with providers was conducted 9 months after implementation to gather their impressions and reactions to the PEDS implementation. 4 pediatricians and 1 nurse practitioner participated.</li> <li>• Use of PEDS was assessed via medical chart review for all 2- and 3-year-old well child visits for pre- and post-implementation.</li> <li>• Implementation fidelity was measured through child chart reviews for accuracy and item agreement as well as clinic surveys. Medical assistants were instructed to provide the PEDS at every WCC visit for children between the ages of 6 months and 9 years. Providers were not asked to find a PEDS survey and complete it with the parent if it was not already completed when they entered the examination room but rather to address the flaw in the arranged system with the staff. Most providers delivered developmental surveillance rather than formal screening in the instances when a PEDS was not completed.</li> </ul>
<b>Staff Qualifications</b>	<p>Pediatricians conducted second-stage screenings</p>
<b>Key Findings</b>	<ul style="list-style-type: none"> <li>• 61.6% of eligible children were screened by parents completing the PEDS.</li> <li>• After the screening approach was implemented, and compared with same-aged children before the screening approach was implemented, there were more behavioral concerns identified in the two-year old cohort of children and more developmental concerns identified in the three-year old cohort of children.</li> <li>• Referrals only were made for developmental concerns (as behavioral concerns were addressed by the provider at the time of the visit). The study team found that “Overall referral rates for 2-year-olds remained similar pre-PEDS and post-PEDS implementation, whereas referral rates increased for 3-year-olds “ and “Referral rates for children with new concerns were not significantly different pre-PEDS versus post-PEDS, either overall or for the separate age groups.”</li> <li>• Types of referrals were consistent with those produced before the screening approach was implemented.</li> </ul> <p>Identification Rates</p> <ul style="list-style-type: none"> <li>• Charts for 616 children were reviewed. New developmental and behavioral concerns were identified for 149 children. A new developmental concern was identified for 143 children. A new behavioral concern was identified for 61 children.</li> <li>• The study team found that “Nearly all of the children with a behavioral concern also had a developmental concern.”</li> <li>• Of the 149 children identified with a new developmental or behavioral concern, 30 already were receiving services (for a different concern).</li> <li>• The study team found that there was a significant increase in identification of developmental concerns (20.7% vs. 26.3%; <math>p = .05</math>) and behavioral concerns (8.0% vs. 12.2%; <math>p = .04</math>). More specifically, among two-year old children, identification of behavioral concerns increased from 7.1% to 14.2% (<math>p=.02</math>). There was not a change, however, in the identification of developmental concerns among two-year old children. Among three-year old children, identification of developmental concerns increased from 11.2% to 19.2% (<math>p=.02</math>); there was not an increase in the identification of behavioral concerns.</li> <li>• The study team compared children who had a completed PEDS to those who did not. Among three-year old children, twice as many concerns were identified for children who received a PEDS</li> </ul>

screening, compared to those who had not, but the differences between the two groups of children were not statistically significant ( $p=.058$ ).

#### Second-Stage Developmental Screening Process

- A second-stage developmental screening process, or SSS, accompanied the use of the PEDS and did not exist before using the PEDS.
- After starting the use of the PEDS, “19% of referrals for 2-year-olds and 22% for 3-year-olds were for SSS.” Before using the PEDS, “20% of referrals for 3-year-olds were to a developmental specialist”. After using the PEDS, there were no such referrals (to a developmental specialist). The study team suggested that the care providers “ chose to begin with the available SSS instead of referring directly to a developmental specialist for further evaluation.”

## End Notes

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<sup>i</sup> Berry, C., Krutz, G. S., Langner, B. E., & Budetti, P. (2008). Jump-starting collaboration: The ABCD initiative and the provision of child development services through Medicaid and collaborators. *Public Administration Review*, May/June, pp. 480-490.

<sup>ii</sup> Germuth, A. (2016). Evaluation of Smart Start’s Race to the Top – Early Learning Challenge: Assuring Better Child Health and Development (ABCD) Project: 3-Year Summary Report. Durham, NC: EvalWorks, LLC.

<sup>iii</sup> Hanlon, C. (2013). Measuring and improving care coordination: Lessons from ABCD III. National Academy for State Health Policy. Retrieved from: [http://www.nashp.org/wp-content/uploads/sites/default/files/measuring.improving.care\\_.coordination.pdf](http://www.nashp.org/wp-content/uploads/sites/default/files/measuring.improving.care_.coordination.pdf)

<sup>iv</sup> Kaye, N., & Rosenthal, J. (2008). Improving the delivery of health care that supports young children’s healthy mental development: Update on accomplishments and lessons from a five-state consortium. Portland (ME): National Academy for State Health Policy. Retrieved from: [http://www.nashp.org/sites/default/files/ABCD\\_II\\_Report\\_0.pdf](http://www.nashp.org/sites/default/files/ABCD_II_Report_0.pdf)

<sup>v</sup> Klein and McCarthy (2009). North Carolina’s ABCD Program: Using community care networks to improve the delivery of childhood developmental screening and referral to early intervention services. New York: The Commonwealth Fund.

<sup>vi</sup> Pelletier, H., & Abrams, M. (2002). The North Carolina ABCD Project: A new approach for providing developmental services in primary care practice. Retrieved from: [http://nashp.org/sites/default/files/lessons\\_ABCDI.pdf](http://nashp.org/sites/default/files/lessons_ABCDI.pdf)

<sup>vii</sup> Plaza, C., Rosenthal, J., & Hinkle, L. (2013). The enduring influence of the Assuring Better Child Health and Development (ABCD) Initiative. National Academy for State Health Policy.

## Additional Resources

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Pinto-Martin, J. A., Dunkle, M., Earls, M., Fliedner, D. & Landes, C. (2005). Developmental stages of developmental screening: Steps to implementation of a successful program. *American Journal of Public Health*, 95(11), pp. 1928-1932.

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*Published: July 2018*