# Three Publications on Academic Detailing

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ORIGINAL PAPER

## Engaging Pediatricians in Developmental Screening: The Effectiveness of Academic Detailing

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**Abstract** Use of formal developmental screening tools in the pediatric medical home improves early identification of children with developmental delays and disorders, including Autism Spectrum Disorders. A pilot study evaluated the impact of an academic detailing module in which trainers visited 43 pediatric primary care practices to provide education about implementing developmental screening tools in well-child services. Attendees responded to a post presentation survey stating that they planned to implement screening in their practices. Medicaid billing data showed an increase in the state's overall rate of screening. An audit of medical charts in five practices that received the training and five that did not showed higher screening rates in practices that received the training as well as higher rates after the training than before. These pilot study results indicate the potential of academic detailing as an effective strategy for improving rates of developmental screening.

**Keywords** Developmental screening · Autism screening · Primary care · Physician education · Early detection of developmental disorders

The average age of identification of autism in children has been shown to vary from 3.1 years (Mandell et al. 2005) to 5.7 years, (Shattuck et al. 2009) and for other developmental delays, reports show (Sand et al. 2005) that only 20–30% of children with delays are identified before entering school. Despite this variation in age of diagnosis, experts agree that the tools exist to identify children at younger ages (Filipek et al. 2000), when interventions can be most effective (Heckman 2006). The primary care pediatric practice setting, or medical home (Sia et al. 2004), is an optimal venue for identifying children with and at risk for developmental delays at the youngest possible age. Medical home, a concept that the American Academy of Pediatrics (AAP) developed to describe optimal care for children with special needs, has been expanded to describe care for all children that is accessible, continuous, comprehensive, coordinated, family-centered and culturally sensitive.

The pediatric medical home provides services to the vast majority of children and can take advantage of frequent and longitudinal relationships with families to monitor development over time and in the context of the family environment. The 2007 Medical Expenditure Panel Survey (Center for Financing, Access and Cost Trends 2007) reported that more than 88% of children ages 5 years old and younger had a usual primary care provider, across all ethnic and racial categories. The majority of these children (75%) received primary care in an office, as opposed to a hospital, setting. The primary care pediatric office visit, then, provides an excellent opportunity to reach a majority of children with early screening for developmental problems.

The current recommendations from the AAP (American Academy of Pediatrics 2006) call for developmental surveillance at all of the 14 recommended well-child visits for children birth through age five (Duncan et al. 2008). The AAP also recommends developmental screening with a standardized tool at the 9, 18 and 30 (or 24) month visits.

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Developmental surveillance includes eliciting parental concerns, documenting and maintaining a longitudinal developmental history, observing the child, identifying protective and risk factors, and obtaining input from others who interact with the child (e.g., day care providers). Formal screening includes the administration of standardized tools, which often are parent completed. Among the tools recommended by the AAP for use with young children are the Parental Evaluation of Developmental Status (PEDS) (Glascoe 2003) and the Ages and Stages Questionnaire (ASQ) (Squires et al. 1997). Both tools achieve at least moderate sensitivity (PEDS: .74 to .79, ASQ: .70 to .90) and specificity (PEDS:.70 to .80, ASQ: .76 to .91) (American Academy of Pediatrics 2006). Parents or caretakers can complete the PEDS in 2–10 min and the ASQ in 10–15 min, making both tools easy to administer as part of pediatric health care visits.

The AAP (Johnson and Myers 2007) also recommends administration of the Checklist for Autism in Toddlers (CHAT) or Modified Checklist for Autism in Toddlers (M-CHAT) at 18 and 24 month visits (Baron-Cohen et al. 1996; Robins et al. 1999, 2001). This tool is available in English and four other languages. The M-CHAT showed sensitivity above .80 and specificity above .90 in initial studies (Robins et al. 2001) with comparable results in more recent studies (Snow and Lecavalier 2008). The CHAT and M-CHAT screening tools also have been validated for use in pediatric primary care practices (Robins 2008). The M-CHAT can be accompanied by standardized, follow-up parent/caretaker interview questions that help those who score and interpret the screening tool further determine how likely it is that a positive response on one or more items warrants further and more extensive evaluation. Follow up questions are available for each item of the M-CHAT and when used, increase the positive predictive value of the screening process (Kleinman et al. 2008).

A study from a pediatric practice in Oregon (Hix-Small et al. 2007) showed that without formal screening tools, child health providers are highly specific in recognizing children with developmental delays, but not very sensitive. This study had pediatricians note evidence of a developmental delay at the 12 month exam and also had parents complete a formal screening tool, but the pediatricians were not told of the results of the tool. Nearly all (95%) of the children whom the pediatricians identified based on clinical observation were deemed eligible for early intervention services after full evaluation. However, the screening tool identified several additional children who were eligible for services after full evaluation. In total, the pediatricians had missed 67% of eligible children based on clinical observation alone. This finding underscores the potential of formal screening to improve identification of young children with developmental delays.

Studies of the use of formal developmental screening tools in pediatric primary care show varying degrees of implementation. A 2002 survey of 1617 members of the AAP (Sand et al. 2005) found that 23% used formal screening tools in their practices. This percentage rose to 57% when the survey was repeated in 2009 (Radecki et al. 2011). A study of pediatricians in Delaware and Maryland (Dosreis et al. 2006) indicated a high rate of screening for developmental delay with the Denver II (50% of respondents) and a low rate of screening for Autism Spectrum Disorders (ASD) (8%). Sices et al. (2003) found similar results in a national sample of pediatricians, with half of survey respondents stating that they use a formal developmental screening tool during routine well-child visits. In an analysis of the 2007 National Survey of Children's Health, Bethell et al. (2011) reported that parent interviews showed a variation in developmental screening rates across states from a low of 11.7% of children screened in New York to a high of 47% in North Carolina. Miller et al. (2011) showed attainment of an 80% autism screening rate when pediatricians worked in partnership with autism specialists. Barriers cited by pediatricians for not screening with formal tools include: time, reimbursement to cover purchase of tools, screening and scoring (Honigfeld and McKay 2006; Sices et al. 2003) and lack of information about screening tools (Golnik et al. 2009).

Literature on successful efforts to improve developmental screening in pediatric practice is limited, and has been particularly scarce since the publication of the AAP developmental screening guidelines in 2006. The North Carolina Assuring Better Child Health and Development (ABCD) (Earls and Hay 2006) initiative was able to improve the rate of developmental screening in pediatric practices to more than 70% of well-child visits. ABCD used physician champions, workflow maps, networks of community services, staff training and periodic sharing of process and outcome data to change practice throughout the state. Schonwald et al. (2009) demonstrated the feasibility of implementing developmental screening in two urban pediatric primary care settings. King et al. (2010) reported on the results of an AAP pilot project to implement developmental screening in 17 pediatric practices. With a small amount of financial support to implement screening and a one-day educational training program, practices reported screening rates from 68 to 85% 9 months into the study. These practices were all committed to screening before participation in the study, and did not collect pre-study screening rates. In addition, since the publication of the AAP guidelines, programs and policies have emerged to support the practice of developmental screening in pediatric primary care. Several states (Kaye and May 2009) now reimburse providers for screening with a formal screening tool on the same day as a

well-child exam, and an increasing number of educational opportunities are now available to train child health providers in developmental screening (King et al. 2010). Additional literature is needed on successful efforts to improve developmental screening in current pediatric practice settings.

The Child Health and Development Institute of Connecticut (CHDI) has a long history of using academic detailing to educate pediatric healthcare providers about best practices in child health care. In collaboration with the state's Children's Trust Fund, CHDI supported dissemination of a presentation on developmental surveillance and screening to 150 child health practices in 2004. Follow up chart audits (McKay 2006) showed that twice as many children were identified as at risk for developmental delay after practices had the presentation, and twice as many children were identified in practices that had the presentation compared with practices that did not. Although this educational effort was successful in promoting earlier identification of children at risk for delay through developmental surveillance, no practices increased their use of formal screening tools.

The present study is a pilot study which evaluated the effectiveness of a CHDI-sponsored academic detailing program, Educating Practices in the Community (EPIC), intended to improve developmental screening in child health practices in Connecticut. Academic detailing involves educational outreach through a personal visit by a trained person to health professionals in their own settings. (O'Brien et al. 2007) Successful academic detailing programs are developed as tailored interventions to overcome barriers to behavior change using simple messages, and are delivered by a respected colleague. As described by Soumerai and Avorn (1990), the key components of academic detailing interventions include: (1) investigating the baseline knowledge and motivations for clinical behavior patterns and potential barriers to behavior change, (2) defining clear educational and behavioral objectives, (3) establishing credibility through a respected organizational identity, (4) referencing authoritative and unbiased sources of information and presenting both sides of controversial issues, (5) stimulating active participation in educational interactions, (6) using concise graphic educational materials, (7) highlighting and repeating the essential messages, and (8) Providing positive reinforcement of improved practices in follow-up visits. Academic detailing is a multi-component process that incorporates many of the promotional techniques used by pharmaceutical company sales representatives. For example, the EPIC program schedules presentations for pediatric providers in their own practices over the lunch hour, provides a free lunch for all attendees, and distributes copies of educational materials to attendees.

Research suggests (Freemantle et al. 2000) that traditional methods of education, such as didactic, lecture-based continuing medical education (CME) sessions, have little to no effect on the behavior of health professionals. Academic detailing has demonstrated effectiveness at promoting behavioral change among health care professionals in a variety of clinical decision-making areas, including blood transfusion practice (Soumerai et al. 1993), antibiotic utilization (Finkelstein et al. 2001) and psychiatric disorders (Soumerai 1998). Specifically to children's health care, academic detailing has successfully changed practices in the areas of pain management techniques (Schechter et al. 2010) and improved asthma management (Cloutier and Wakefield (2011). More specifically to the issue of screening in pediatric practices, Gaines et al. (2008) found that physicians receiving educational outreach visits about developmental coordination disorder (DCD) significantly improved their knowledge about DCD and their ability to identify children with this condition.

The research reported herein describes results of a pilot study to evaluate two EPIC academic detailing programs, or modules, which address developmental screening in pediatric primary care. One EPIC module focused on general developmental screening, and the other focused on autism screening. CHDI retained the services of physician experts to develop and present the two modules. The modules were developed independently and presented by different individuals.

## Methodology

### Intervention

The EPIC Autism Spectrum Disorder (ASD) Screening module was presented by a trained pediatric primary care provider in 43 pediatric and family medicine practices from March 2009 through November 2010. The EPIC Developmental Monitoring module was presented by four trained child development specialists in 14 child health sites between January 2009 and August 2010. Attendees at both presentations included providers and office staff members. Both modules highlighted: (1) information about developmental delays, (2) use of formal developmental screening tools recommended by the AAP, (3) billing codes to ensure reimbursement for developmental screening, and (4) community resources for connecting children to evaluation and intervention services. The developmental monitoring presentation suggested use of the Ages & Stages Questionnaire (ASQ) or Parents' Evaluation of Developmental Status (PEDS) at 9, 18, and 24 (or 30) month visits, and the ASD presentation focused on use of one screening tool, the Modified Checklist for Autism in Toddlers (M-CHAT), at

18 and 24 month visits. This study reports on three types of data: (1) Medicaid claims data showing billing for screens performed, (2) participant feedback data after attending an EPIC presentation, and (3) data from chart audits performed in 10 pediatric practices.

### Participants in the EPIC Presentations

Following each EPIC presentation, attendees completed an evaluation of the information presented, as well as information about their role in the practice. 318 attendees completed evaluations, representing a range of office roles: Pediatrician (32%), Nurse (20%), Medical Assistant (16%), Family Physician (9%), Office Manager (5%), Other Office Staff (6%) and Other (11%).

### Participants in the Chart Audit Study

A chart audit to identify the impact of EPIC ASD on the rate of ASD screening at the 18 month well-child visit was conducted in five practices that received the EPIC Autism module ("*Intervention practices*") and five practices that did not receive the module ("*Control practices*"). The Institutional Review Board at Connecticut Children's Medical Center approved the chart audit portion of the study, and data transmitted to the authors did not include patient or practice identifiers.

The audited practices were members of a large primary care network in Connecticut, whose members include 19 pediatric practices across the state. A senior project manager from the network selected the practices and performed the chart audits. Nine practices in the network had received the EPIC ASD presentation at the time of the audit, and were eligible to participate as intervention practices. All nine practices were invited to participate in the audit, and five agreed to participate. The main reason for practices not agreeing to participate was the introduction of a new electronic medical record system that would make it difficult to systematically find the appropriate charts and screening information. In each of the intervention practices, the research manager audited 20 charts for 18 month well- child visits going backward sequentially from before the date of the EPIC presentation, and 20 charts from 18 month well-child visits moving forward sequentially starting at least 3 months after the EPIC presentation. In one intervention practice, due to inadequate sample size, only 16 charts were audited for the post-EPIC period.

From the pool of ten practices in the network that had not received the EPIC ASD presentation at the time of the audit, the research manager selected five control practices that best matched the intervention practices on practice size and agreed to participate in the chart audit. The research manager audited 20 charts from 18 month well-child visits sequentially from August 1, 2009. The sampling method yielded information from 18 month well-child visits that occurred 5 months after the first EPIC ASD presentation. This allowed the analysis to account for possible environmental confounders that may have encouraged ASD screening without receipt of an EPIC ASD presentation. Characteristics of the intervention and control practices are described in Table 1.

### Measures of Presentation Effectiveness

Participants in the EPIC presentations completed a short evaluation form about the presented information. Participants rated their answer to the following questions: "How likely are you to use the information presented?" on a scale from *1/Definitely to 5/Definitely Not;* "Was this training useful?" on a scale from *1/Very useful to 5/Not useful* and; "Which of the following might pose barriers to using the information? (A) Lack of time, (B) Not enough information, (C) Information too difficult to use" on a scale from *1/Not a barrier to 5/May be a barrier.*

### Chart audit Measures

The research manager reviewed each chart for evidence of a completed ASD screening tool at the 18 month well-child visit, and if appropriate, noted which tool was used. The chart audit data also included: result of screening, patient's type of insurance (commercial or Medicaid), and patient gender.

**Table 1** Practice size, patient load, and patient characteristics of intervention and control practices

| Characteristics | Mean (SD) | | Range | | t* |
|---|---|---|---|---|---|
| | Intervention | control | Intervention | control | |
| Number of providers | 3.4 (1.95) | 3.2 (1.64) | 2–6 | 2–5 | 0.18 |
| Number of patients (1/1/09–12/31/10) | 2892 (1948.29) | 3134.4 (1812.46) | 1351–5867 | 1581–5559 | −0.20 |
| Number of patient encounters (1/1/09–12/31/10) | 9317.2 (6073.2) | 10640.4 (5550.7) | 4198–18388 | 5172–17437 | −0.35 |
| % Patients insured by medicaid** | 8% (0.15) | 23% (0.18) | 0%–35% | 5%–50% | −1.45 |

* $p > 0.05$ for all of these characteristics

**Among charts audited for this study (n = 40 for intervention practices, n = 20 for control practices)

Data Analyses

The authors prepared descriptive analyses of program evaluation data. The number of charts in which a complete ASD screening tool was located out of the total number of charts audited was considered as the rate of ASD screening in each practice. Separate "pre" and "post" rates were calculated for intervention practices. Intervention practices' "pre" and "post" rates were compared using a Student's *T* test in Microsoft Office Excel 2007. Intervention practice "post" rates were compared to matched control rates using a Student's *T* test in Microsoft Office Excel 2007.

## Results

The Connecticut Department of Social Services approved Medicaid reimbursement for developmental screening on the same day as a well-child exam in October 2008. The billing data reflect the entire population of children younger than three insured by Medicaid and cannot be disaggregated by provider or practice. The state's Medicaid program (Connecticut Department of Social Services 2010) provided the research team with 2007–2009 data for billing for developmental screening (including screening for ASD) with Current Procedural Terminology (American Medical Association 2010) code 96110 at well-child exams for children <3 years. Figure 1 shows the number of times that billing code 96110 was used on the same day as a well-child visit in 2007–2009, with an increasing number of screens performed across the 3 year period. In 2009, the percentage of well-child visits that also included billing for a developmental screen was 10–12% for the 9 month visit, 21% for the 18 month visit, and 11–17% for the 24 month visit.

In response to evaluation forms distributed following EPIC presentations, 318 participants provided feedback on the EPIC presentation in which they participated. The majority of respondents indicated intent to use the information presented: 94% chose 1 or 2 on a scale from *1/Definitely* (intend to use information) to *5/Definitely Not* (intend to use information). Participants also indicated that the training was useful: 95% chose 1 or 2 on a scale from *1/(Information is) Very Useful to 5/(Information is) Not Useful*. Participants identified time as the most likely barrier to using the information from the presentation: 26% selected 4 or 5 on a scale from *1/Not a Barrier to 5/May Be a Barrier*. Only 6% identified *"not enough information"* and only 4% identified *"information too difficult to use"* as potential barriers.

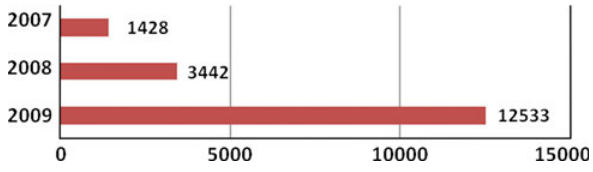


**Fig. 1** Number of screens billed to Medicaid with well-child visits for children <3 years, 2007–2009

Chart audit data augmented presentation feedback data, which indicated participants' intention to implement screening in their practices. The chart audit demonstrated that rates of using a formal ASD screening tool at the 18 month well-child visit increased significantly in all five of the intervention practices (Table 2). All (100%) of the ASD screening tools that were completed in intervention practices were M-CHATs.

Rates of utilization of a formal ASD screening tool at the 18 month well-child visit in four of the five intervention practices were equal (n = 2) or higher (n = 2) than the rates of screening observed in the matched control practices (Table 2). One intervention practice had a screening rate that was lower than the matched control practice. 100% of the ASD screening tools that were completed in control practices were M-CHATs. The average rates of screening for the two groups were 70.8% for the intervention practices and 46% for the control practices.

Of the 95 children screened with the M-CHAT in intervention practices, seven screens showed ASD concerns. In the control practices, four of the 34 screens showed ASD concerns. Overall, 8.53% of the M-CHAT screens yielded positive results.

**Table 2** Rates of ASD Screening in Intervention Practices Post-EPIC Presentation, compared with Pre-EPIC Presentation and with matched control practices (No EPIC Presentation)

| | Pre-EPIC screening rate (%) | Post- EPIC screening rate (%) | Matched control screening rate (%) | P (Pre vs. Post-EPIC) (Post-EPIC v. control) |
|---|---|---|---|---|
| Practice 1 | 25 | 85 | 0 | 0.001* |
| | | | | <0.001* |
| Practice 2 | 60 | 85 | 0 | 0.04* |
| | | | | <0.001* |
| Practice 3 | 40 | 100 | 100 | <0.001* |
| | | | | n/a |
| Practice 4 | 0 | 65 | 70 | <0.001* |
| | | | | 0.37 |
| Practice 5 | 0 | 19 | 60 | 0.04* |
| | | | | <0.005* |

*$p < 0.05$

**Discussion**

This pilot study demonstrates that academic detailing is a promising strategy for changing practice behavior and engaging pediatricians in developmental screening at the 18 month well-child exam. Our findings are consistent with other studies that have shown the power of in-office presentations to promote change in health practices. It is likely that payment for developmental screening on the same day as a well-child exam and expansion of evaluation services for children with possible ASD also contributed to the results of this pilot study. The Connecticut Department of Social Services approved reimbursement for the Current Procedural Terminology code 96110 prior to the EPIC educational outreach program for ASD. Commercial insurers adopted the same reimbursement policy as the Medicaid program. At the same time that reimbursement became available, the state's Part C Early Intervention program expanded evaluation and intervention opportunities for children with ASD concerns. The Part C lead agency, Birth to Three, designated ten agencies across the state as Autism program centers.

Another contributing factor to the success of the academic detailing program was the availability of a free, easy-to use, parent-completed screening tool. The M-CHAT can be completed in 5–10 min and scored by office personnel before the physician or nurse practitioner sees the family. It cues the child health provider as to possible red flags, which can easily open the conversation with parents about possible developmental concerns.

EPIC outreach efforts, then, were supported by the availability of a free, easy-to-use screening tool, favorable reimbursement policy, and the availability of full evaluations through and intervention services from the state Birth to Three program. These factors have undoubtedly facilitated pediatricians' implementation of formal screening for autism spectrum disorders. However, this study demonstrates the added value of the EPIC ASD program, as all intervention sites improved their rate of screening after the EPIC presentation, and two of the five showed rates of screening higher than matched control practices. We conclude that without the EPIC training, practices may not know about the AAP guidelines for screening, available reimbursement for screening and referral resources for children with ASD concerns.

Intervention practice number five showed only modest implementation of ASD screening, although the practice performed no screening before the EPIC ASD presentation. It is possible that this practice was slow to make changes, and that many of the charts sampled for the chart audit study represented visits from before the practice started its screening program. One of the major limitations of the analysis presented is that it does not allow us to identify the factors that contributed to practice change once the educational intervention was completed. Another limitation of the study is the relatively small sample size of five intervention and five control practices, which was dictated by the limited number of trained practices in the primary care physician network that volunteered to participate in the study. We feel that our sample included somewhat diverse pediatric primary care settings in terms of patient population and size, and that our results may be generalized to other pediatric primary care settings. However, in order to better evaluate the impact of the intervention, a larger sample of trained and untrained practices drawn from more diverse pediatric primary care settings would be needed.

Three control group practices showed impressive rates of screening without receiving the EPIC ASD presentation. There are several possible explanations for this. The practices could have participated in the EPIC developmental monitoring presentation and selected the M-CHAT for the 18 month developmental screening tool. Some pediatric practices in Connecticut are participating in a study underway at the University of Connecticut (UConn) to validate a new version of the M-CHAT, and it is possible that practices in the intervention and control groups are also in the UConn study. Participation in the UConn study provides practices with a guaranteed, follow-up phone interview of the parents of patients who score positive on the revised version of the M-CHAT. In addition, children who are found to have remaining concerns after the follow-up phone interview, receive a timely, free full evaluation with referral to early intervention services as needed. Finally, either intervention or control practices could have taken up ASD screening based on other educational programs and guidelines distributed by the AAP. Despite these limitations, our results still show an impressive increase in screening in practices from before the ASD EPIC presentation.

The implications of this study for improving early detection of ASD and other developmental delays are:

1. State Medicaid programs and commercial insurers should reimburse pediatricians for screening that occurs during well-child services and with standardized screening tools. The added reimbursement makes it feasible for practices to purchase, score and provide follow-up counseling to parents about the results of screening.
2. States should ensure that services are in place to provide full evaluations, and when warranted, appropriate intervention services for children who do not pass practice-based screening. Without these services, it is unlikely that pediatricians will implement formal screening programs in their practices.
3. States should support outreach to child health providers to educate them about screening for ASD and other

developmental delays as well as referral options for children for whom there are concerns. Academic detailing has been shown to be a promising strategy for doing this, and certainly yields more practice change than traditional methods of medical education. However, more research is needed to determine the factors that facilitate implementation of screening programs in pediatric practices.

4. States and practices should monitor their performance in screening young children for developmental delays and ASD. This commitment to continuous quality improvement can ensure that all children with, or at risk for delays, are identified at the earliest possible age.

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Help Me Grow National Center

# USING ACADEMIC DETAILING TO CHANGE CHILD HEALTH SERVICE DELIVERY IN CONNECTICUT:

## CHDI's EPIC Program

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IMPACT

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CHDI

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# About the Child Health and Development Institute of Connecticut:

The Child Health and Development Institute of Connecticut (CHDI), a subsidiary of the Children's Fund of Connecticut, is a not-for-profit organization established to promote and maximize the healthy physical, behavioral, emotional, cognitive and social development of children throughout Connecticut. CHDI works to ensure that children in Connecticut, particularly those who are disadvantaged, will have access to and make use of a comprehensive, effective, community-based health and mental health care system.

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# USING ACADEMIC DETAILING TO CHANGE CHILD HEALTH SERVICE DELIVERY IN CONNECTICUT:

## CHDI's EPIC Program

## INTRODUCTION

The Child Health and Development Institute (CHDI) is dedicated to improving health and mental health systems for children in Connecticut. CHDI uses several strategies for assisting pediatric health and mental health providers in reforming their practices to better serve children, including learning collaboratives, workshops and academic detailing.

This report reviews the literature on academic detailing as a strategy for promoting practice change and describes CHDI's five years of experience with the Educating Practices in the Community (EPIC) Program, which uses academic detailing to educate child health providers about ways that they can improve care. We describe the development and content of each EPIC presentation, and share feedback on the presentations from practices that have participated. Available impact-oriented data for certain presentations are also presented. The report concludes with a discussion of lessons learned from CHDI's experiences in providing academic detailing presentations on a variety of health and mental health topics in pediatric and family medicine practices.

**Research suggests that traditional methods of education, such as didactic, lecture-based continuing medical education sessions, have little to no effect on the behavior of health professionals.**

## WHY ACADEMIC DETAILING?

Academic detailing is an educational process that incorporates many of the promotional techniques used by pharmaceutical companies.[1] Academic detailing involves educational outreach through a personal visit by a trained professional to health providers and staff in their own practice settings.[2] As described by Soumerai, the key components of academic detailing interventions include:

(1) Investigating the baseline knowledge and motivations for clinical behavior patterns and potential barriers to behavior change;

(2) Defining clear educational and behavioral objectives;

(3) Establishing credibility through a respected organizational identity;

(4) Referencing authoritative and unbiased sources of information and presenting both sides of controversial issues;

(5) Stimulating active participation in educational interactions;

(6) Using concise graphic educational materials;

(7) Highlighting and repeating the essential messages; and

(8) Providing positive reinforcement of improved practices in follow-up communications.[1]

**Academic detailing has consistently demonstrated effectiveness at promoting behavioral change among health care professionals in a variety of clinical decision-making areas...**

Successful academic detailing programs are developed as tailored interventions to overcome barriers to behavior change using simple messages, and are delivered by a respected colleague.[3]

Research suggests that traditional methods of education, such as didactic, lecture-based continuing medical education sessions, have little to no effect on the behavior of health professionals.[3,4,5] Other practice change strategies such as audit and feedback, provider incentives, and administrative regulations have been found to vary in effectiveness with no single strategy producing predictable positive results.[5] However, academic detailing has consistently demonstrated effectiveness at promoting behavioral change among health care professionals in a variety of clinical decision-making areas, including blood transfusion practice[6], antibiotic utilization[7] and managing psychiatric disorders.[1,2,3,5,8] Notably, a 2007 review of the literature found academic detailing to be less effective at its initially intended application, changing physician prescribing practices, than at changing other types of practice, such as utilization of screening tests.[2]

More specifically to the population targeted by the EPIC program, educational outreach has been demonstrated to be an effective method of changing the behavior of pediatric primary care providers in a variety of clinical areas. Several studies from Connecticut provide evidence for broad application of academic detailing to address child health issues.

In collaboration with Connecticut's Children's Trust Fund and its Help Me Grow program, CHDI supported the dissemination of a presentation on developmental surveillance and screening to 150 child health practices in 2004. Follow-up chart audits indicated that twice as many children were identified as at risk for developmental delay after practices had the presentation compared to the period before they had the presentation, and twice as many children were identified in practices that had the presentation compared with practices that did not.[9] Another study from Connecticut found improvements in asthma management and patient outcomes following practice participation in office-based education.[10] Schechter et al. found that teaching practice staff pain management techniques to ease children's discomfort with immunizations was effective as measured by families' subsequent reports of pain associated with their children's immunizations.[11] Gaines found that physicians receiving educational outreach visits about developmental coordination disorder (DCD) significantly improved their knowledge about DCD and their ability to identify and diagnose children with this condition.[12]

**CHDI has grown the EPIC program over the past five years to include ten modules covering a variety of child health topics that are priority areas for practice improvement in Connecticut.**

## CHDI's EPIC Program

CHDI created the Educating Practices in the Community (EPIC) program in 2002 as a pilot continuing education program for child health providers in Connecticut. The Pennsylvania Chapter of the American Academy of Pediatrics (AAP) had tested the academic detailing approach and found it to be successful for improving practice in two areas: 1) teaching pediatricians about suspected child abuse and neglect (SCAN) and 2) promoting integration of services for children with special health care needs.[13] CHDI, with funding from its parent organization, the Children's Fund of Connecticut, provided funding to the Connecticut AAP Chapter to disseminate a SCAN module based on the work in Pennsylvania and to expand EPIC to other topics following the SCAN pilot. At this time, two other pediatric academic detailing programs existed in Connecticut. The University of Connecticut School of Dentistry was promoting early preventive dental services and connection of children to dental services through onsite education in practices. At the same time, the Children's Trust Fund, with support from the Commonwealth Fund, was providing office-based education on early detection of children at risk for developmental delay and connection to community-based services. The Children's Trust Fund reached 150 child health sites in 2003 to 2004 and documented the efficacy of their work in changing practice behaviors.[9,14,15] CHDI's plan included bringing the existing academic detailing programs that addressed child health into a coordinated statewide training initiative.

In 2005, CHDI assumed full responsibility for EPIC, and has grown the program over the past five years to include ten modules[a] covering a variety of child health topics that are priority areas for practice improvement in Connecticut. Once a child health topic is identified, CHDI retains pediatric experts to develop EPIC modules according to the criteria in Figure 1.

[a] Note: The SCAN module has been discontinued

### Figure 1. Criteria for EPIC Modules

- Lead to improved quality of care for pediatric patients in the primary care setting
- Recognized as relevant to pediatric primary care and reflect a clinical area in which care is not optimal
- Reflect evidence-based practice in children's health or development and cover a content area for which educational opportunities may be lacking
- Is appropriate for all professionals and staff in the office, and training should engage the entire office
- Lead to staff behavior change that is closely tied to important patient outcomes
- Participants must have opportunities to practice new skills and discuss implementation as part of the training
- Based on a Connecticut initiative and have a Connecticut contact to work with the EPIC Steering Committee
- Include a follow-up component to support the practice during implementation
- Include information regarding additional resources

**A critical component of EPIC is that the whole practice team learns about opportunities for practice change and engages in practical conversations about making changes.**

Trained presenters deliver the modules onsite in pediatric and family medicine practices. Presentations last one hour, include lunch or breakfast, and are provided at no cost to the practice. A critical component of EPIC is that the whole practice team learns about opportunities for practice change and engages in practical conversations about making changes. Therefore, presentations contain information that is relevant to a variety of staff roles in the practice setting. Presenters discuss billing issues to help practices recoup reimbursement for implemented changes and thus involve the office billing staff. Information about distributing patient screening tools and educational materials is included in several modules and addresses the work of front office staff. Each module also provides practical information about resources to improve care by taking advantage of larger policy and/or system supports. Two modules, Autism and Infant Oral Health, carry Continuing Medical Education (CME) credits for physicians. In addition, the American Board of Pediatrics recently approved the Autism module and a related self-chart audit activity for Category Four, Maintenance of Certification credit.[b]

Table 1 contains detailed information about currently active EPIC modules. Practices learn about EPIC in a variety of ways. CHDI staff and module presenters publicize the availability of EPIC at hospital-sponsored CME programs, community pediatrician meetings, and the annual conference of the CT Chapter of Family Physicians. At each practice presentation, the presenter also invites practices to sign up for other modules, and the module feedback form contains a list of available presentations from which attendees can select. CHDI has a full time coordinator who schedules presentations, ensures that lunch and the presentation materials are delivered to the practice site, and collects and maintains feedback data from participants.

[b] The American Board of Pediatrics requires pediatricians to complete two approved practice improvement activities every seven years as part of the Maintenance of Certification process.

**Table 1: Content, Presenters, Supports and Resources for EPIC Modules**

| Module | Learning Objectives | Presenters | Policy/System Supports | Resources Provided |
|---|---|---|---|---|
| **Autism Spectrum Disorders (ASD)** | Recognize red flags<br><br>Use the M-CHAT to screen for ASD<br><br>Talk with parents about positive M-CHAT results<br><br>Connect children to evaluation and intervention services<br><br>Bill for screening and follow-up visits | Primary care and developmental pediatricians | AAP policy for ASD screening<br><br>Medicaid payment for ASD screening<br><br>Part C designated ASD centers for evaluation and intervention | Sample M-CHAT with scoring information<br><br>Billing information for screening services<br><br>List of evaluation resources<br><br>Medical chart stamp for maintaining screening record |
| **Children's Behavior Problems: Brief Intervention** | Coach and empower parents<br><br>Collaborate with families and service systems to address behavioral health issues that are within normal develop-mental themes | Primary care provider with special interest in behavioral health issues | Child developmental Infoline (CDI) inventory of community services[c]<br><br>AAP Bright Futures materials | Bright Futures parent education materials<br><br>References for pediatric resources: AAP toolkits, websites, etc.<br><br>Billing information |
| **Behavioral Health Screening** | Understand guidelines for behavioral health screening<br><br>Implement screening tools<br><br>Bill for screening<br><br>Follow up on positive responses to screening | Child psychologist with experience in primary care setting | Payment for screening in primary care<br><br>System of mental health services to which children who do not pass screening can be referred | Sample screening tools<br><br>Referral resources for follow up evaluations and intervention<br><br>Workflow protocols<br><br>Template for documenting screening results<br><br>Billing information |
| **Care Coordination In the Medical Home** | Understand the elements of care coordination<br><br>Use available resources to coordinate care for patients | Department of Public Health, Children and Youth with Special Health Care Needs (CYSHCN) Care Coordination Contractors | CYSHCN care coordination services<br><br>Primary Care Case Management in Medicaid | Contact information and tools for care coordinators<br><br>Referral forms |
| **Collaborative Health Care** | Foster collaboration with behavioral health specialists<br><br>Use office tools for efficient and effective collaboration in the care of shared patients | Staff from behavioral health agencies in practice's local area<br><br>Child psychologist with extensive experience in pediatric primary care | CT Behavioral Health Partnership (CT BHP) Enhanced Care Clinic[d] (ECC). Program that facilitates partnerships between primary care and behavioral health | Communication tools |

[c] CDI, a component of the United Way's 211 Information and referral system, provides a single point of access for parents, providers and community agencies looking for developmental services for young children.

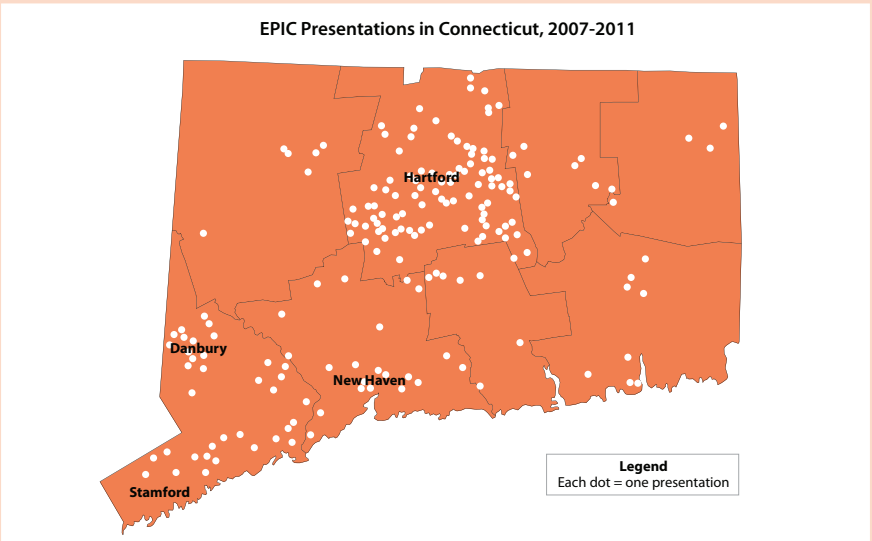
[d] Enhanced Care Clinics are behavioral health agencies that are designated by the State of Connecticut to receive enhanced reimbursement from Medicaid for meeting strict access criteria and for forming formal partnerships with primary care practices.

**Table 1: Content, Presenters, Supports and Resources for EPIC Modules**

| Module | Learning Objectives | Presenters | Policy/System Supports | Resources Provided |
|---|---|---|---|---|
| **Connecting Children to Behavioral Health Services** | Learn about the CT BHP services for children insured by Medicaid<br><br>Identify the right behavioral health services<br><br>Make referrals to behavioral health services | Staff from behavioral health agencies in the practice's local area<br><br>Regional staff from Medicaid behavioral health carve out program (CT BHP)<br><br>Psychologist with extensive experience in pediatric primary care | CT BHP program that ensures access to behavioral health services in ECCs for children insured by Medicaid | Referral information about local community and statewide services |
| **Developmental Surveillance and Help Me Grow** | Learn the components of developmental surveillance<br><br>Implement screening for developmental risks<br><br>Connect children to evaluation and intervention services through CDI | Staff from state Help Me Grow program and Child Development Infoline (CDI) | AAP Developmental Surveillance and Screening policy<br><br>Payment for Developmental screening<br><br>CDI call center | Sample screening tools<br><br>Magnet with CDI contact information<br><br>CDI information for patients |
| **Hearing Loss** | Learn about the importance of early hearing<br><br>Follow up from hospital newborn hearing screening<br><br>Monitor all children's hearing | Pediatricians and audiologists with special interest in early hearing detection and intervention | State Early Hearing Detection and Intervention (EHDI) program<br><br>Expanded eligibility for early intervention services to children with minor hearing loss | Pediatric audiology services<br><br>Billing information for hearing screening |
| **Oral Health** | Perform early mouth exams and preventive counseling<br><br>Apply fluoride varnish<br><br>Bill for early dental services | Pediatric dentist<br><br>Pediatrician with interest in dental services<br><br>Pediatric dental hygienists | Increasing number of general dentists who have been trained to provide dental services for young children<br><br>Payment to pediatric primary care for early dental services | Parent education materials<br><br>Dental referral services<br><br>Fluoride varnish kit |
| **Teen Driver Safety** | Learn the facts about teen car crashes<br><br>Learn safety recommendations and laws governing teen driving<br><br>Engage parents in safe teen driving<br><br>Integrate teen driving safety into anticipatory guidance | Staff from the children's hospital injury prevention center | Laws governing teen driving<br><br>Injury prevention center dedicated to promoting safe teen driving | Summary of state laws<br><br>Parent/teen/provider contract regarding safe driving |

**Between May 2006 and April 2011, EPIC reached 141 pediatric and family medicine practices in Connecticut with one or more presentations for a total of 226 presentations.**

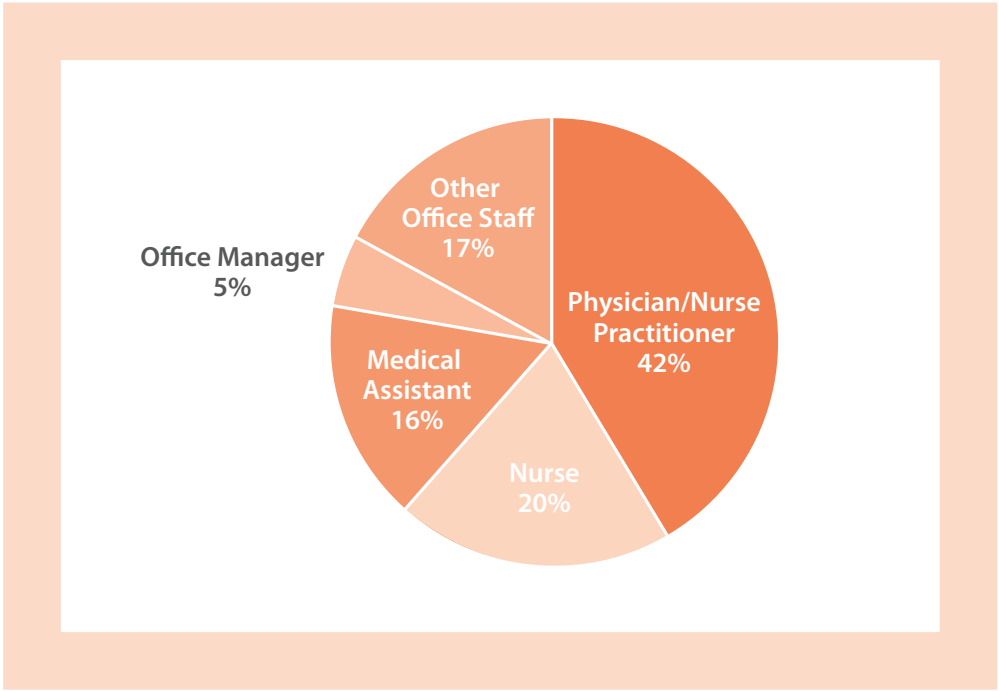
**Figure 2: Distribution of EPIC Presentations to Practices Across Connecticut**




Between May 2006 and April 2011, EPIC reached 141 pediatric and family medicine practices in Connecticut with one or more presentations for a total of 226 presentations. The map in Figure 2 shows the distribution of presentations over the past seven years. EPIC has been more effective in reaching practices within or near the large urban areas but has completed several presentations in the state's less populated areas, where there are fewer health care providers.

More than 1,400 attendees have completed feedback forms, which provide information on their evaluation of the presentations as well as information about their roles within the practice. Figure 3 shows the range of practice personnel who have participated in EPIC presentations. Although the majority of participants are physicians or nurse practitioners, a sizeable number of nurses, medical assistants, office managers, and other office staff (such as billing personnel and front office staff) personnel have also attended.

**Figure 3: Roles of Staff Participating in EPIC Presentations**




## Participant Feedback from Five Years of EPIC

Participants in every EPIC presentation are asked to complete evaluations of the material presented. CHDI uses this feedback for quality monitoring and improvement purposes. Overall, EPIC presentations have been extremely well-received. More than 90% of these respondents stated that they planned to use the information provided. The most frequently cited barriers to practice change included lack of time (26% believed "might be a barrier") and not enough information provided (15% believed "might be a barrier"). Ninety-five percent reported that the information provided was valuable, and 80% like the convenience of having the presentation in the office.

**Practice staff attending EPIC presentations overwhelmingly stated that they planned to use the information they had learned in CHDI's EPIC presentations to make practice changes.**

## Changing Practice in Connecticut

Practice staff attending EPIC presentations overwhelmingly stated that they planned to use the information they had learned in CHDI's EPIC presentations to make practice changes. To determine whether these changes actually occurred, we used Medicaid billing data, chart audit data, surveys, and interviews to evaluate the impact of participation in certain EPIC modules on practice changes and patient outcomes.

In 2010, a chart audit was conducted to identify the impact of the EPIC Autism Spectrum Disorder (ASD) module on the rate of ASD screening at the 18 month well-child visit. The audited practices were members of ProHealth Physicians, a large primary care network in Connecticut. Nine practices in the network had received the EPIC ASD presentation at the time of the audit and five were selected to assess the impact of the EPIC ASD module. Staff from ProHealth audited 20 charts for 18 month well-child visits going backward sequentially before the EPIC presentation, and 20 charts from 18 month well-child visits moving forward sequentially starting at least three months after the EPIC presentation. A comparable sample of charts from five practices that did not have the EPIC presentation was also audited. Analysis of the chart audit demonstrated that rates of using a formal ASD screening tool at the 18 month well-child visit increased significantly in all five of the practices that had the EPIC training (Table 2).

**Table 2: Rates of ASD Screening in Intervention Practices Post-EPIC Presentation, Compared with Pre-EPIC Presentation and with Matched Control Practices (No EPIC Presentation)**

| | Pre-EPIC Screening Rate | Post-EPIC Screening Rate | Matched Control Screening Rate | P (Pre vs. Post-EPIC)<br>(Post-EPIC v. Control) |
|---|---|---|---|---|
| **Practice 1** | 25% | 85% | 0% | <0.001*<br><0.001* |
| **Practice 2** | 60% | 85% | 0% | 0.04*<br><0.001* |
| **Practice 3** | 40% | 100% | 100% | <0.001*<br>n/a |
| **Practice 4** | 0% | 65% | 70% | <0.001*<br>0.37 |
| **Practice 5** | 0% | 19% | 60% | 0.04*<br><0.005* |

*$p < 0.05$

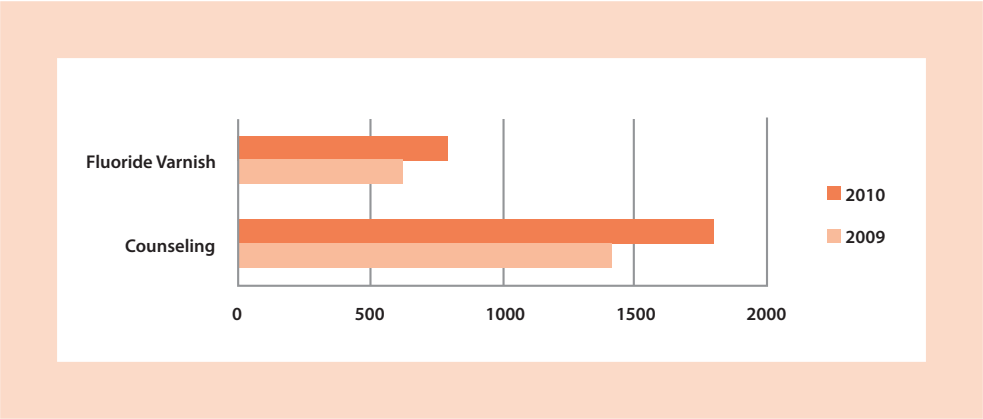
**The EPIC ASD presentation was successful in changing pediatric provider practice, increasing the use of an ASD screening tool (the M-CHAT) at 18 month well-child visits.**

Rates of utilization of a formal ASD screening tool at the 18 month well-child visit in four of the five practices that had the EPIC presentation were equal to, or higher than, the rates of screening observed in the untrained practices (Table 2). The average rates of screening for the two groups were 70.8% for the EPIC practices and 46% for the other practices. The chart audit showed that the EPIC ASD presentation was successful in changing pediatric provider practice, increasing the use of an ASD screening tool (the M-CHAT) at 18 month well-child visits.

There are other indications that EPIC has contributed to changing pediatric practice in Connecticut. Regional care coordination centers for the Department of Public Health (DPH) Children and Youth with Special Health Care Needs (CYSHN) program have reported that they have received referrals as a result of the EPIC presentations on care coordination. Care coordinators, who participate in the EPIC presentations, believed that the personal contact that they established with practice staff at the presentations allowed for improved contact between the care coordinator and the practice staff as they worked to help families. Similarly, after participating in the Connecting Children to Behavioral Health Services module, staff from mental health agencies believed that collaborative relationships between their agency and their partner primary care practices had been strengthened as a result of the EPIC presentation.

**Our ongoing experiences with and assessments of the EPIC program have yielded important lessons for changing child health practice within the context of state and local opportunities for improving child health and integrating health with other child services.**

**Figure 4: Number of Young Children Younger Than Three Receiving Fluoride Varnish and Oral Health Counseling Services from Child Health Providers**




Medicaid claims data also support the impact of the EPIC program on practice change. From 2007, when Medicaid first approved payment for developmental screening, through 2010, Connecticut has seen a 14 fold increase in the number of children younger than three, who received screening as part of their well-child services. During this same time period, EPIC provided screening training in more than 50 pediatric and family medicine sites.

The EPIC Oral Health module reached nine large practices after the Department of Social Services approved it as certification for child health providers seeking reimbursement for counseling and fluoride varnish application for children younger than three. Figure 4 shows the number of children receiving these services from pediatric providers in 2009 and 2010. The EPIC Oral Health training contributed to the statewide growth in the number of pediatric providers counseling parents about oral health and applying fluoride varnish for very young children (Figure 4).

## Lessons Learned from Five Years of Academic Detailing

Our ongoing experiences with and assessments of the EPIC program have yielded important lessons for changing child health practice within the context of state and local opportunities for improving child health and integrating health with other child services. These lessons are discussed as follows.

**1. Child health providers need information about state policies and systems that support their delivery of services to children.**

Although state agencies and national professional organizations are continually changing recommendations, developing programs and implementing supportive policy, pediatric and family medicine providers often know very little about these efforts and continue to practice in the way they have in the past. Practices are overwhelmed with meeting patient needs on a day-to-day basis and often do not keep up with environmental changes that can support their delivery of services.

CHDI has brought EPIC to more than 140 primary care pediatric sites in Connecticut and very rarely encountered a practice that was fully aware of screening guidelines and reimbursement opportunities for screening. Similarly, EPIC trainers have confirmed that practices did not know that the state Department of Public Health had care coordinators available to help them connect children with special health care needs to services, or that certain behavioral health organizations were designated to provide rapid access to services for children insured by Medicaid in their communities. Almost all (95%) participants providing feedback on EPIC presentations rated the information provided as valuable and, more tellingly, the available outcome data demonstrates that practices use the information from the EPIC presentations to make actual changes in their practices, which directly improves patient care.

**2. Pediatric providers need time-saving strategies for meeting patient needs.**

Lack of time was the most frequently reported barrier to implementing changes recommended in EPIC presentations, with 26% of attendees who completed feedback forms responding that it could be a barrier. Opportunities for reimbursement for some recommended practice activities, such as developmental and behavioral screening and dental care, **do not** seem to affect perceptions that time is a factor in implementing change. Thirty-one percent of attendees responded that time was a barrier for behavioral health screening, for which they could be reimbursed from Medicaid and commercial insurers. Most likely, practices recognize the upfront time requirements of developing and implementing screening systems to ensure that children receive the appropriate screening tool, completed tools are scored and provisions for follow-up are in place. Practices also expressed concern about the time needed to provide brief intervention for behavioral health issues, even though providers can be reimbursed for their time spent counseling families.

Messages to pediatric practices need to stress the value of putting in time up front to change practice systems in order to capture additional reimbursement down the road. Implementing screening tools to identify parental concerns at the outset of office visits can shorten the visit by efficiently prioritizing and addressing parental concerns up front. Almost all providers have

experienced the "oh by the way" phenomenon when the provider believes that he/she has completed the visit, and the parent brings up a concern that requires considerable time to address. EPIC screening modules stress the efficiency of soliciting parental concerns at the outset of the visit by using developmental surveillance and parent-completed screening tools.

**3. Practice change is best achieved when community-based service providers commit to collaborating with child health providers.**

This lesson was most obvious in the follow-up interviews with participants in the Care Coordination EPIC module and behavioral health specialists who participated in a "Train the Trainer" for several Behavioral Health EPIC modules. In the two DPH CYSHCN areas where the care coordination contractors were most active in EPIC presentations, the contractors received referrals and worked with child health staff in identifying needs, locating resources and connecting children to appropriate community-based services. After participating in a "Train the Trainer" to learn to present several Behavioral Health EPIC modules in primary care practices, behavioral health specialists stated that they had implemented changes to better address children's behavioral health issues by collaborating with primary care providers. Interviews with partner primary care practices confirmed the positive impact of the EPIC training on collaborative relationships between health and mental health providers.

Practices that participated in the Hearing Loss module also demonstrated high rates of intention to make practice changes, which could be related to the availability of support from local pediatric audiologists and early intervention programs. Two recent national reports of screening for ASDs reported that child health providers were more likely to adopt screening programs when they perceived that they had support from Autism specialty services.[17,18]

**4. EPIC can help practices use data to monitor their delivery of services and practice processes and improve care.**

Beginning in 2009, pediatricians need to complete two practice improvement activities every seven years in order to maintain their certification from the American Board of Pediatrics, which sanctions activities as acceptable under this aspect of the Maintenance of Certification (MOC) requirement. Acceptable activities engage pediatricians in using practice data to assess performance and measure improvement. In June 2011, the ABP approved the EPIC ASD module and follow-up data collection and review as a recertification activity. Providers who wish to receive MOC credit for ASD screening will enter data from appropriate well-child visits and receive feedback on how well they are meeting AAP guidelines for ASD screening and follow-up. Other EPIC modules are appropriate for MOC credit, also, emphasizing the contribution of academic detailing to creating meaningful and measureable practice change within a quality improvement context. As

the field of healthcare moves toward accountable, data-driven care, practices will become increasingly willing to participate in programs, such as EPIC, which can support them in making practice changes to improve care and measuring the impact of those changes on practice and patient outcomes.

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**Why Academic Detailing?**

Academic detailing is an educational process which incorporates many of the promotional techniques used by pharmaceutical company sales representatives.[1] Academic detailing involves educational outreach through a personal visit by a trained person to health professionals in their own settings.[2] As described by Soumerai , the key components of academic detailing interventions include: (1) Investigating the baseline knowledge and motivations for clinical behavior patterns and potential barriers to behavior change, (2) Defining clear educational and behavioral objectives, (3) Establishing credibility through a respected organizational identity, (4) Referencing authoritative and unbiased sources of information and presenting both sides of controversial issues, (5) Stimulating active participation in educational interactions, (6) Using concise graphic educational materials, (7) Highlighting and repeating the essential messages, and (8) Providing positive reinforcement of improved practices in follow-up visits.[1] Successful academic detailing programs are developed as tailored interventions to overcome barriers to behavior change using simple messages, and are delivered by a respected colleague.[3]

Research suggests that traditional methods of education, such as didactic, lecture-based continuing medical education (CME) sessions, have little to no effect on the behavior of health professionals.[3,43,5] Other educational strategies such as audit and feedback, provider incentives, and administrative regulations have been found to have only variable effectiveness.[5] However, academic detailing has consistently demonstrated effectiveness at promoting behavioral change among health care professionals in a variety of clinical decision-making areas, including blood transfusion practice[6], antibiotic utilization[7] and managing psychiatric disorders.[8] (Soumerai, 1998) [1,2,3,5] Interestingly, a 2007 review of the literature found that academic detailing is less effective at its initial application, changing

physician prescribing practices, than at changing other types of practice, such as providing screening tests.[2]

More specifically to the population targeted by the EPIC program, educational outreach has been demonstrated to be an effective method of changing the behavior of pediatric primary care providers in several clinical areas. In collaboration with the Connecticut's Children's Trust Fund and its Help Me Grow program, CHDI supported the dissemination of a presentation on developmental surveillance and screening to 150 child health practices in 2004. Follow up chart audits showed that twice as many children were identified as at risk for developmental delay after practices had the presentation, and twice as many children were identified in practices that had the presentation compared with practices that did not.[9] Another study from Connecticut showed improvements asthma management and outcomes following practice participation in office-based education.[10] Schechter showed that teaching practice staff pain management techniques to ease children's discomfort with immunizations was effective as reported by families' subsequent reports of pain associated with their children's immunizations.[11] Gaines found that physicians receiving educational outreach visits about developmental coordination disorder (DCD) significantly improved their knowledge about DCD and their ability to identify and diagnose children with this condition.[12]

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