

**Developmental screening by pediatricians in Illinois:
Understanding the role of training**

Prepared by:

Jenifer Cartland, PhD
Tracie L. Smith, MPH

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Child Health Data Lab
Mary Ann and J. Milburn Smith Child Health Research Center
Children's Memorial Research Center
2300 Children's Plaza, #157
Chicago, IL 60614

jcartland@childrensmemorial.org

312/573-7772

Since 2005, Enhancing Developmentally Oriented Primary Care Project (EDOPC) has provided on-site training for primary care providers throughout Illinois to expand developmental screenings for children ages 0-3. EDOPC is a partnership of the Advocate Health Care Healthy Steps Program, the Illinois Academy of Family Physicians (IAFP), the Illinois Chapter of the American Academy of Pediatrics (ICAAP), and the Illinois Department of Healthcare and Family Services. The support the development of a range of strategies that primary care settings can implement to most effectively provide comprehensive, developmentally oriented health care.

The current paper examines findings from a statewide survey of primary care providers. The survey explores the respondents' developmental screening practices and examines continuing needs for the expansion of developmental screening. The survey includes items that assess primary care providers' comfort with developmental screening, experience with screening and referral, use of specific screening tools, use of screening when presented with certain clinical symptoms, barriers to screening, and barriers to the use of Illinois' Early Intervention Program (EI).

METHODS

The Illinois Primary Care Survey was developed during the fall of 2008 by the EDOPC evaluation team. The evaluators relied on previous surveys conducted by the American Academy of Pediatrics on the topic of developmental screening, and reviewed survey drafts with EDOPC's Project Management Committee. All of the recommendations from the Project Management Committee were incorporated into the survey. After the survey was finalized, it was submitted to the Institutional Review Board at Children's Memorial Hospital and given an expedited review.

Table 1: Response rate ¹	ICAAP	Family Practitioners
Mailed	1353	1000
Completed	395	93
Refused	16	2
Returned	17	33
Raw response rate	30.8%	9.8%
Illinois pediatricians who perform health supervision for children 0-3²	872	-----
Respondents who perform health supervision for children 0-3	310	-----
Estimated final	35.6%	-----

¹ After four mailings for ICAAP members; after three mailings for family practitioners

² Estimated by the American Academy of Pediatrics Department of Research.

The goal of the survey was to reach a sample of Illinois primary care providers who provide health supervision to children during the first three years of life. The survey was mailed to a random sample of 1000 members of the Illinois Academy of Family Physicians and all members of the Illinois Chapter of the American Academy of Pediatrics. After three rounds, the response rate for the IAFP was below 10%. Because the response rate was so low, IAFP was dropped from the study. A fourth round of surveys was mailed to ICAAP members, bringing the total number of ICAAP responses to 395.

It was not possible to identify ahead of the survey which primary care providers provide health supervision to very young children (and therefore who would be the target of EDOPC efforts). The survey asked that those who do not provide these services to complete the first page and then return the survey. However, few pediatricians returned a survey with only the first page completed.

To estimate the number of Illinois pediatricians who provide health supervision to children under age three, we contacted the Department of Research at the American Academy of Pediatrics, who were able to estimate that 872 Illinois pediatricians provide these services. This number was used as the denominator for our response rate estimate. The numerator included all the pediatricians who completed the health supervision portion of the survey (n=310). Our estimated response rate, after four rounds of mailings, was 35.6% (Table 1).

A sample with a low response rate, as this one, cannot be confidently taken to be representative of ICAAP members who provide health supervision to children under the age of 3. However, we can identify several likely sources of bias that will help us interpret the findings. Respondents are more likely to complete a survey if they are interested in the subject matter, or if the subject matter is seen as relevant to them (Fowler, *Survey Research Methods*, Sage, 1988). Better educated individuals also are more likely to complete surveys. These known biases in mailed survey response rates suggest that the bias in our sample is towards pediatricians who conduct more health supervision and/or who conduct more developmental screenings, who have a large portion of their practice focused on children under age three, and, perhaps, who have worked to become educated in developmental screening.

TRAINING EXPERIENCES

The evaluators were given a list of primary care providers trained by the EDOPC staff. Cross linking this list to the respondents of the survey resulted in 44 survey respondents who were trained by EDOPC. Table 2 outlines what types of training these 44 survey respondents received.

Table 2: Survey respondent training according to EDOPC records	Number trained
At least one type of training	44
Developmental Screening and Referral	20
Social/Emotional Screening and Referral	15
Early Autism Detection and Referral	7
Perinatal Maternal Depression Screening and Referral	23
Domestic Violence Effects on Children	15
Childhood Obesity Prevention	4
Other training (e.g. Healthy Steps)	7

One of the survey items asked respondents about their exposure to developmental screening training. Eighty-seven reported that they had been trained by "ICAAP/EDOPC." This survey item was cross-tabbed by the training data from EDOPC (Table 3). Twenty-nine of the respondents who were in the EDOPC database responded on the survey that they were trained by EDOPC. Fifteen additional respondents in the EDOPC database either reported they had never received training (n=7) or that they had received training from other sources (n=8). These 15 respondents were added to the group of survey respondents who reported to be trained by ICAAP/EDOPC. Twelve respondents reported being trained, were not included in the EDOPC database and reported no source of training. These 12 were

added to the 'other' training' category. Three did not respond to the training question and could not be located in the EDOPC database. These three were excluded from the analysis. The final number of survey respondents receiving EDOPC training is 106; 60 respondents received training from other sources; and 141 received no training at all (Table 4).

Table 3: Survey respondent training and training status from EDOPC database (before final training status designation)	Survey responses (n=310)	EDOPC records (n=44)
Never received training to do developmental screening	148	7
Received some kind of trained to do developmental screening	159	37
Source of training (reported by respondents):		
ICAAP/EDOPC	87	29
Residency program	34	5
Other	24	3
No response to survey item	12	----
No response	3	----

Table 4: Final training status designation	Number
Not trained at all	141
ICAAP/EDOPC	106
Trained outside of ICAAP/EDOPC	60
Unknown	3
TOTAL	310

Table 5: Practice characteristics by training status				
	Training status			p-value
	ICAAP/EDOPC n=106	Other n=60	None n=141	
Degree				
MD	96.2	95.0	96.5	.78
DO	3.8	5.0	2.8	
NP	0	0	.7	
Type of Practice				
FQHC/Look-Alike	17.2	8.3	3.5	.04
Private Practice	65.7	75.0	81.6	
Residency Program	3.8	0	2.8	
Hospital Based	7.6	11.7	7.8	
Other	5.7	5.0	4.3	
Specialty				
Peds-General	91.5	83.3	89.4	.49
Peds-Specialty	4.7	6.7	5.0	
Med-Peds	3.8	8.3	5.0	

Other	0	1.7	.7
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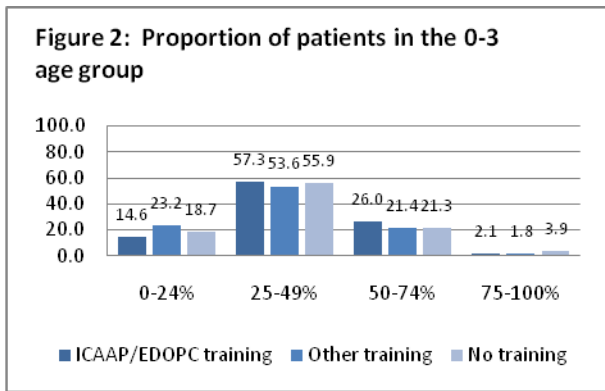
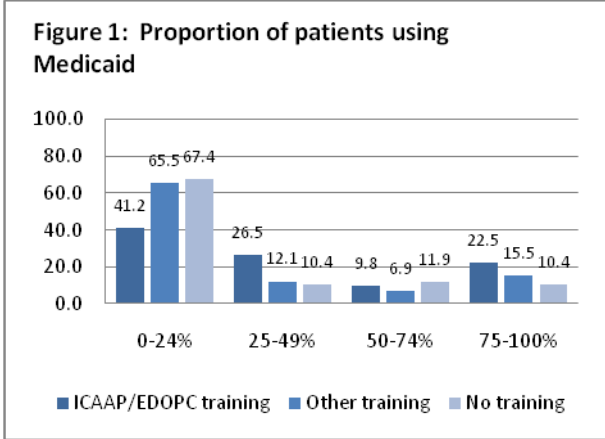


Table 6: Comfort in discussing topics with parents (average score on a 5-point scale, with 5=very comfortable)				
Comfortable talking about...	Training status			p-value
	ICAAP/EDOPC n=106	Other n=60	None n=141	
Domestic violence	3.5	3.4	3.2	.15
Child abuse	3.8	3.7	3.7	.65
Maternal depression	3.9	3.8	3.5	.03
Autism	4.3	4.1	4.0	.05
School/daycare problems	4.5	4.3	4.3	.10
Social and emotional issues	4.6	4.5	4.4	.11
Nutrition	4.6	4.7	4.4	.07
Obesity	4.6	4.6	4.4	.03
Physical Development	4.9	4.9	4.7	.01
Vaccines	4.9	4.9	4.9	.19

PRACTICE CHARACTERISTICS

Table 5 outlines the characteristics of the survey respondents. The only statistically significant difference between the practice characteristics of those who received EDOPC training and others is that the EDOPC trained respondents were more likely to be in an FQHC or look-alike. Similarly, Figure 2 indicates that Medicaid clients make up a larger portion of the practice for EDOPC-training clinicians.

About 15-20% of the pediatricians responding indicated that children under age 3 make up one-quarter of their practice (Figure 2); about 75% percent report that they comprise up to one-half of their patients. There is no statistically significant difference among the groups based on training status.

COMFORT WITH AND KNOWLEDGE OF DEVELOPMENTAL SCREENING

Respondents were asked to rank their comfort level with dealing with a wide range of patient concerns, among them developmental issues. The range of possible patient issues was offered in order to 'rank' respondents' relative comfort with developmental issues.

Respondents were most comfortable discussing vaccines and physical development with parents (Table 6) and least comfortable discussing domestic violence and child abuse. Training appears to have some impact on respondents' comfort levels. Providers who were trained by either EDOPC or some other program were significantly more likely to report being comfortable discussing physical development and maternal depression. The EDOPC group was additionally more comfortable discussing autism than the other two groups.

Respondents were asked to complete five knowledge items regarding developmental screening and other EDOPC training topics. In general, there is no difference among the groups in the accuracy of their answers (Table 7). Respondents were most likely to make an error on the developmental screening item. The specific knowledge statements are listed in Box 1.

Table 7: Percent of respondents answering item correctly

	Training status			p-value
	ICAAP/EDOPC n=106	Other n=60	None n=141	
Developmental Screening	81.9	71.7	78.4	.31
Autism	98.1	98.3	96.4	.63
Domestic Violence	100.0	93.3	100.0	.01
Maternal Depression	96.2	94.9	99.3	.14
Social and Emotional Screening	96.0	96.5	91.1	.22

Box 1: Knowledge items

Developmental screening: A provider with good clinical judgment will pick up the same percentage of infants and toddlers at risk for being delayed or mildly delayed as a provider using a validated developmental screening to.

Autism: Identification of autism prior to age 3 should be avoided because of the potential negative effects of labeling a child with this diagnosis.

Domestic violence: A two year old exposed to violence in the home may exhibit symptoms of post-traumatic stress disorder.

Maternal depression: Postpartum depression may occur at any time in the first year after delivery.

Social and emotional screening: Lack of joint attention is a red flag indicating possible emotional delay.

SCREENING AND REFERRAL PROCEDURES

The vast majority of respondents had made at least one referral to Early Intervention in the year previous to taking the survey (Figure 3). About 50% of respondents reported that they ‘always’ followed-up to make sure the referral was completed and almost two-thirds of respondents reported that their practice has a ‘system’ for referrals and follow-ups. There is no difference among respondents with different training experiences. However, EDOPC-trained respondents are more likely to use the Medicaid 96110 billing code than are those who were not trained. Respondents trained by non-EDOPC programs were also more likely to use the billing code, but not to the same degree.

Among respondents who do not use the 96110 Medicaid billing code, those who received no training were significantly more likely to report that they are not familiar with the billing code (Figure 4).

EDOPC-trained respondents were more likely than non-training and non-EDOPC-trained respondents to use four of the specific screening tools listed (Table 8). These include the Ages and Stages Questionnaire, the Ages and Stages Questionnaire: Social/Emotional, Modified Checklist for Autism in Toddlers, and the Edinburgh Postnatal Depression Scale.

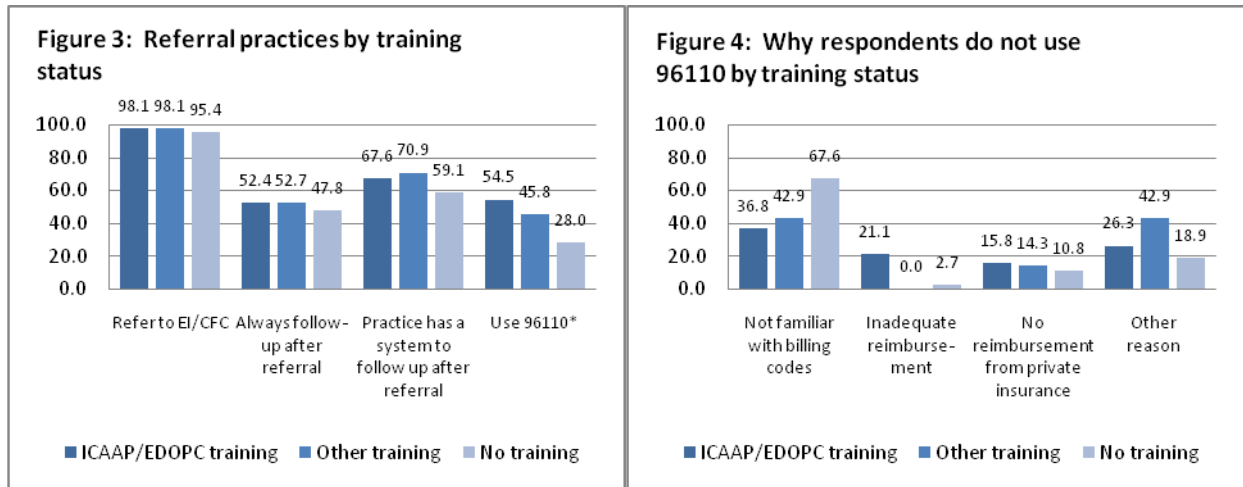
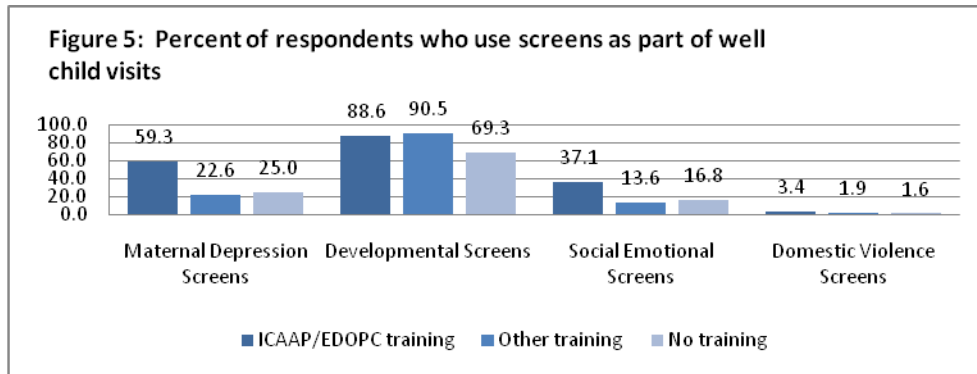


Table 8: Percent of respondents reporting to use specific screening instruments				
	Training status			p-value
	ICAAP/EDOPC n=106	Other n=60	None n=141	
ASQ	67.3	50.0	33.3	.00
ASQ:SE	35.8	18.4	14.2	.00
PEDS	14.1	19.6	9.6	.19
m-CHAT	64.4	52.9	42.9	.01
EPDS	64.1	34.0	23.2	.00
PHQ-9	9.8	10.0	5.6	.42
HITS	4.3	6.3	1.6	.27

Respondents who were trained are more likely to use screening tools during routine well child visits. EDOPC-trained respondents are more likely to conduct a Maternal Depression screen and a Social Emotional screen than other respondents (Figure 5). Respondents with any training (EDOPC or non-EDOPC) are more likely to report that the conduct developmental screenings as part of a routine well-child visit.

Clinicians were asked how likely it is that they would perform a developmental screen when presented with a range of clinical circumstances. Their responses are included in Table 9. Trained clinicians (EDOPC and non-EDOPC) are far more likely to conduct a developmental screen in the listed circumstances than are non-trained clinicians.



	Training status			p-value
	ICAAP/EDOPC n=106	Other n=60	None n=141	
Likely to screen if...				
Low birth weight	71.3	71.9	47.8	.00
Very low birth weight	73.0	70.2	49.3	.00
Parent concerned	81.0	75.0	59.7	.00
History of drug use	69.0	63.2	46.7	.00
Traumatic birth	70.3	69.6	52.6	.00
Hearing or vision impairment	77.6	69.6	56.3	.00
Genetic syndrome	78.6	68.4	57.5	.01
Congenital anomalies	69.8	61.4	44.8	.00
Sib or parent w/developmental issues	75.8	68.4	45.9	.00
Abnormal physical growth	74.0	68.4	51.9	.00

BARRIERS TO SCREENING AND THE EARLY INTEVENTION PROGRAM

Respondents who had training (EDOPC or non-EDOPC) were less likely to report specific barriers to conducting a developmental screening and more likely to report confidence in their ability to screen and in the screening tools than were respondents who did not have training (Table 10). The most persistent barrier to screening relates to time limitations in the practice setting, with two-thirds of trained and

four-fifths of non-trained respondents agreeing with this barrier. The two least cited barriers to referral are lack of knowledge about referral and lack of treatment options.

Table 10: Percent of respondents reporting that they are 'agree' or 'strongly agree' that the following are barriers/facilitators to screening

	Training status			p-value
	ICAAP/EDOPC n=106	Other n=60	None n=141	
Time limitations in practice	69.9	67.8	81.3	.09
Language barriers	26.7	23.7	28.0	.93
Lack of training on validated screening tools	28.2	27.1	60.7	.00
Lack of adequate screening tools	19.6	20.7	45.8	.00
Lack of medical office staff to perform screening	47.6	52.5	62.8	.12
Lack of knowledge regarding referral options	9.6	6.8	12.7	.70
Lack of treatment options	19.2	10.2	12.8	.22
Confidence in ability to screen	76.2	78.0	54.5	.00
Confidence in the validity of screening instruments	78.2	75.9	60.9	.01
Belief that formal screening is an appropriate role for pediatrician	84.5	81.4	77.0	.05
Inadequate reimbursement for conducting screen	38.2	35.6	42.2	.13

Table 11: Percent of respondents reporting that they are 'agree' or 'strongly agree' that the following are barriers to referral to Early Intervention

	Training status			p-value
	ICAAP/EDOPC	Other	None	
	n=106	n=60	n=141	
Lack of information about EI program	21.4	21.7	30.4	.40
Lack of understanding of EI process/procedures	24.0	21.7	31.2	.18
Lack of available EI services in my practice area	18.3	16.7	24.3	.37
Lack of time to deal with EI program	15.4	25.0	19.0	.48
Lack of feedback from EI about child's progress	34.6	26.7	27.0	.19
Failure to incorporate pediatricians' input into EI assessment/evaluation	15.5	20.0	20.6	.57
Inconsistent quality of EI services	28.8	36.7	24.8	.45
Limited evidence that EI services are effective	9.6	12.1	7.3	.42
Uncertainty about EI eligibility criteria	15.4	16.7	21.7	.21
Facilitators:				
Pre-printed standardized referral form	53.4	39.0	55.1	.25
Single, known contact person within EI	47.6	50.0	50.7	.56
Toll-free telephone number for state-wide referrals	49.5	53.4	50.7	.85

When it comes to barriers to using the Early Intervention program (EI), there were no differences based on training experiences (Table 11). Very few respondents (fewer than 10%) indicated that a barrier to referral is that there is limited evidence supporting the effectiveness of Early Intervention. About 50% of the respondents indicated that having standardized referral forms, a single point of contact at EI, a toll-free number for statewide referrals would make working with EI easier.

Table 12 reports a wide range of experiences in dealing with EI. Only about two-thirds of respondents indicate that they receive a copy of the Individualized Family Service Plan (IFSP); about the same percentage indicate that EI informs them of enrollment decisions and provides progress reports of the achievement of IFSP goals. About three-quarters of the respondents report that EI provides them with assessment and evaluation results.

Table 12: Percent of respondents reporting that Early Intervention provides the following information

	Training status			p-value
	ICAAP/EDOPC	Other	None	
	n=106	n=60	n=141	
Notifies you upon receipt of referral	52.4	58.2	51.1	.67
Notifies you if they are unable to contact family	37.6	29.6	29.5	.39
Provides you with assessment/evaluation results	78.2	72.4	75.8	.71
Informs you of reasons for EI enrollment decisions	65.3	55.2	68.3	.22
Presents you with an IFSP	67.3	57.9	64.2	.49
Provides you with progress reports on achievement of IFSP goals	67.3	63.2	59.1	.44
Notifies you when your patient is discharged from EI	56.4	56.1	51.2	.68

EARLY INTERVENTION AND DEVELOPMENTAL/MEDICAL SPECIALISTS

The survey queried respondents about the likelihood of their making a referral to EI and to a developmental specialist when presented with certain clinical findings. Figures 6 and 7 compare respondents' decisions to refer to EI and to developmental specialists. There is no statistically significant differences by training group. Pediatricians, overall, are more likely to refer children to EI than to a developmental specialist. Over 90% of respondents reported that they would refer a child to EI if the child missed a developmental milestone, presented with global developmental delays, demonstrated delayed speech and language, and had poor muscle tone or poor motor development. On the other end of the scale, fewer than 40% would refer a child to EI if there was a perceived risk of child abuse or neglect.

Referrals to developmental specialists were made less frequently. Over 80% of respondents reported that they would refer a child to a developmental specialist if the child missed a developmental milestone or presented with global developmental delays. Fewer than 50% would refer the child based on parental concerns, the presence of a speech delay, or being at risk of neglect or abuse.

Table 13 reviews several factors that pediatricians report as being important in determining whether to make a referral to EI. The most important factors are the presence of parental concern, the age of the child and the severity of the disability. The least important factors are the presence of a medical diagnosis and family income.

Figure 6: Percent of respondents who would refer to EI under stated circumstances

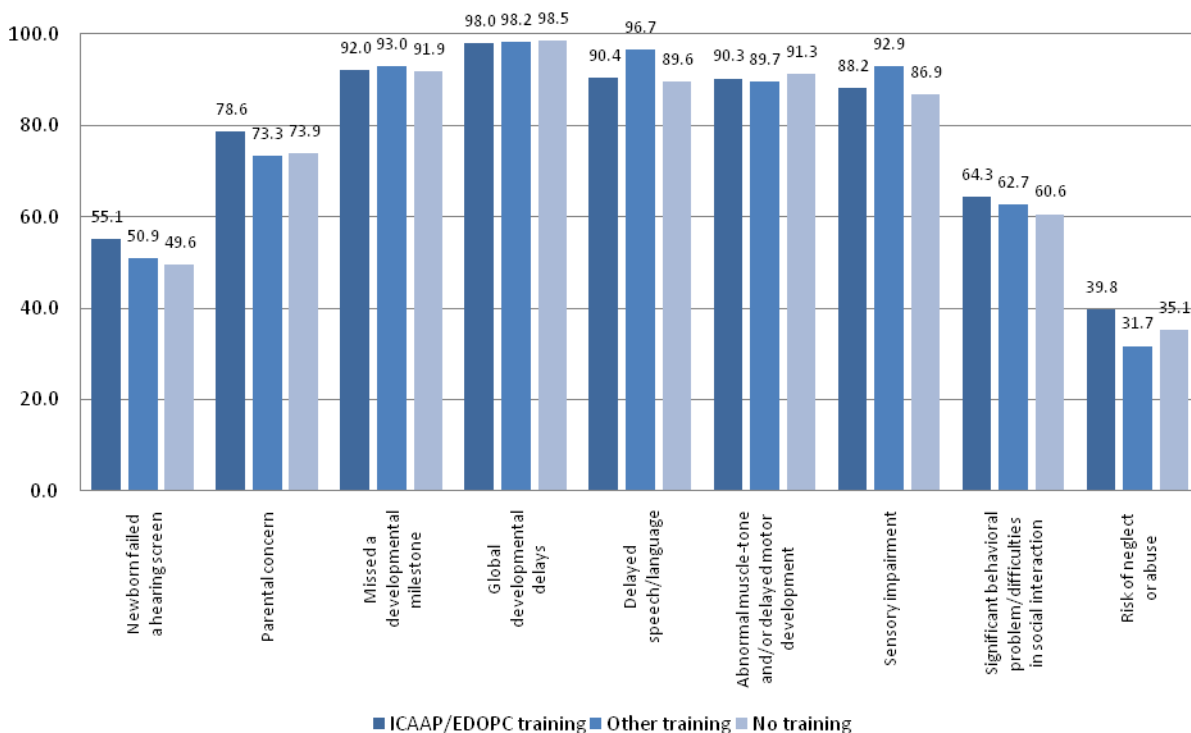


Figure 7: Percent of respondents would refer to a developmental/medical specialist under stated circumstances

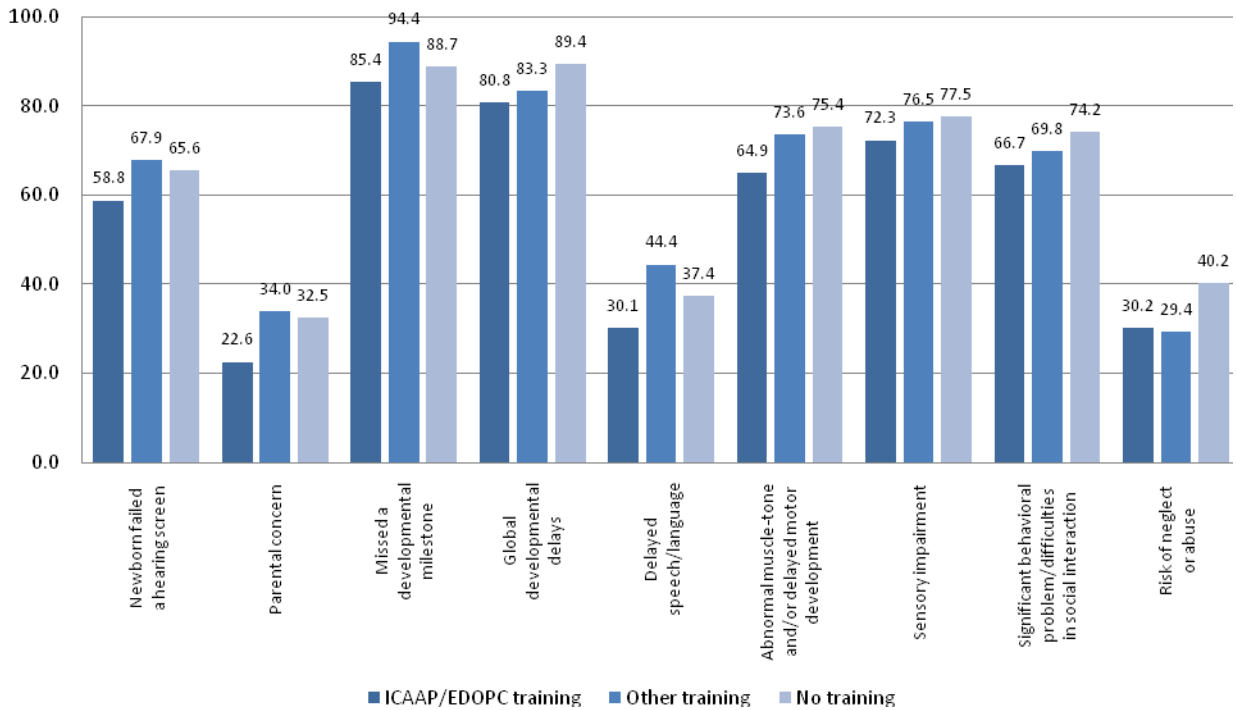


Table 13: Percent of respondents reporting these are ‘very important’ factors when deciding to refer to EI

	Training status			p-value
	ICAAP/EDOPC n=106	Other n=60	None n=141	
An established medical diagnosis	20.6	23.3	25.2	.79
The severity of the disability	52.4	63.3	62.6	.36
The age of the child	61.2	55.9	62.6	.94
The level of parent concern	67.0	70.0	63.3	.59
Family income	7.8	13.3	10.1	.66

OVERALL ASSESSMENT OF EARLY INTERVENTION

Finally, respondents were asked to assess the EI program, both in terms of the mechanics of how it works and its effectiveness (Table 14). Over 90% of pediatricians responding agree that EI maximizes children’s development. Less than one-quarter expressed concern that EI is not an effective use of resources or ‘overpathologizes’ normal development. About two-thirds of respondents agree that they get adequate feedback regarding the referred child and that EI takes the primary care providers’ concerns into consideration.

While most respondents report that they agree that EI tailors the services to the needs of the child and that EI are staff are competent, fewer agree that services are provided in a timely manner. About half of

respondents agree that services are provided in a culturally competent manner and that EI facilitates the transition to services after the child has aged out of EI.

Table 14: Percent of respondents reporting that they are 'agree' or 'strongly agree' with these statements about the Early Intervention programs

	Training status			p-value
	ICAAP/EDOPC n=106	Other n=60	None n=141	
<i>The effectiveness of EI:</i>				
Helps maximize child's development	95.2	93.3	96.4	.36
Is an ineffective use of limited public resources	21.9	26.7	16.1	.23
"Overpathologizes" children with minor developmental variations	27.2	25.0	22.6	.08
<i>Working with primary care providers:</i>				
Takes into account the providers' concerns	69.2	66.7	74.6	.36
Provides providers with adequate feedback regarding child	57.1	53.3	59.4	.63
<i>How EI functions:</i>				
Performs evaluation to determine eligibility and initiates services in a timely manner	59.6	62.7	63.0	.94
Services are tailored to the needs of individual children	83.8	81.7	85.4	.41
Team is professionally competent	76.7	71.7	78.7	.77
Conducts services in a culturally appropriate manner	55.9	46.4	54.1	.73
Facilitates child and family's transition to needed services beyond 36 months	55.3	39.0	46.3	.18

CONCLUSIONS

The report reviews the findings from a statewide survey of ICAAP members. The survey was designed to gather information about knowledge of, comfort with and practices related to developmental screening for children under the age of three. The major findings are:

(A) Compared with pediatricians who did not receive training, pediatricians who received training in developmental screening (regardless of the training source) were:

- (1) more comfortable with conducting screenings
- (2) more likely to screen when presented with certain clinical evidence
- (3) more likely to perform developmental screens as part of a well child visit
- (4) less likely to report barriers to screening in their practices

(B) Compared to pediatricians who received non-ICAAP/EDOPC training or who did not receive any training at all, ICAAP/EDOPC trained pediatricians were:

- (1) more likely to report using the 96110 billing code for Medicaid patients
- (2) more likely to use specific recommended screening tools
- (3) more likely to conduct maternal depression screening and social/emotional screening during routine well child visits

(C) There were no differences among the three groups (those trained by ICAAP/EDOPC, those trained by other programs and those who were not trained) in:

- (1) Knowledge about screening based on a brief, five-item knowledge test
- (2) Perceived barriers to referring to the EI program
- (3) Assessment of the information that EI provides to the primary care providers while a child is receiving services
- (4) Factors affecting the choice to refer to EI and developmental specialists
- (5) Overall assessment of how well EI works and how effective it is

The response rate to the survey is relatively low, which means that the respondents cannot be confidently taken to be representative of Illinois pediatricians serving young children. The biases in the data would likely lead to an over-estimate of the number of pediatricians conducting screenings and have a higher percent of pediatricians who are comfortable with screening and who had training. The between-group comparisons (comparing trained and non-trained pediatricians) are less affected by the bias than would statewide screening estimates.