

Developmental Screening Practice Initiatives Bibliography

1. Rydz D, Srour M, Oskoui M, Marget N, Shiller M, Birnbaum R, Majnemer A, Shevell MI. Screening for developmental delay in the setting of a community pediatric clinic: a prospective assessment of parent-report questionnaires. *Pediatrics*. 2006;118:e1178-1186.

Abstract

OBJECTIVES: Our goal for this study was to prospectively test whether parent-completed questionnaires can be effectively used in the setting of a busy ambulatory pediatric clinic to accurately screen for developmental impairments. Specific objectives included (1) assessing the feasibility of using parent-report instruments in the setting of a community pediatric clinic, (2) evaluating the accuracy of 2 available screening tests (the Ages and Stages Questionnaire and Child Development Inventory), and (3) ascertaining if the pediatrician's clinical judgment could be used as a potential modifier. **METHODS:** Subjects were recruited from the patient population of a community clinic providing primary ambulatory pediatric care. Subjects without previous developmental delay or concerns noted were contacted at the time of their routine 18-month-old visit. Those subjects who agreed to participate were randomly assigned to 1 of 2 groups and completed either the Ages and Stages Questionnaire or Child Development Inventory. The child's pediatrician also completed a brief questionnaire regarding his or her opinion of the child's development. Those children for whom concerns were identified by either questionnaire underwent additional detailed testing by the Battelle Development Inventory, the "gold standard" for the purposes of this study. An equal number of children scoring within the norms of the screening measures also underwent testing with the Battelle Development Inventory. **RESULTS:** Of the 356 parents contacted, 317 parents (90%) agreed to participate. Most parents correctly completed the Ages and Stages Questionnaire (81%) and the Child Development Inventory (75%). Predictive values were calculated for the Ages and Stages Questionnaire and the Child Development Inventory (sensitivity: 0.67 and 0.50; specificity: 0.39 and 0.86; positive predictive value: 34% and 50%; negative predictive value: 71% and 86%, respectively). Incorporating the physician's opinion regarding the developmental status of the child did not improve the accuracy of the screening questionnaires. **CONCLUSIONS:** Three important conclusions were reached: (1) parent-completed questionnaires can be feasibly used in the setting of a pediatric clinic; (2) the pediatrician's opinion had little effect in ameliorating the accuracy of either questionnaire; and (3) single-point accuracy of these screening instruments in a community setting did not meet the requisite standard for development screening tests as set by current recommendations. This study raises important questions about how developmental screening can be performed, and we recommend additional research to elucidate a successful screening procedure.

2. Earls MF, Hay SS. Setting the stage for success: implementation of developmental and behavioral screening and surveillance in primary care practice--the North Carolina Assuring Better Child Health and Development (ABCD) Project. *Pediatrics*. 2004; 118:e183-188.

Abstract

Early identification of children with developmental and behavioral delays is important in primary care practice, and well-child visits provide an ideal opportunity to engage parents and perform periodic screening. Integration of this activity into office process and flow is necessary for making screening a routine and consistent part of primary care practice. In the North Carolina Assuring Better Child Health and Development Project, careful attention to and training for office process has resulted in a significant increase in screening rates to >70% of the designated well-child visits. The data from the project prompted a change in Medicaid policy, and screening is now statewide in primary practices that perform Early Periodic Screening, Diagnosis, and Treatment examinations. Although there are features of the project that are unique to North Carolina, there are also elements that are transferable to any practice or state interested in integrating child development services into the medical home. Included here are lessons learned and a listing of practical tools for implementation.

3. Love JM, Kisker EE, Ross C, Raikes H, Constantine J, Boller K, Brooks-Gunn J, Chazan-Cohen R, Tarullo LB, Brady-Smith C, Fuligni AS, Schochet PZ, Paulsell D, Vogel C. The effectiveness of early head start for 3-year-old children and their parents: lessons for policy and programs. *Developmental Psychology*. 2005;41:885-901.

Abstract

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Early Head Start, a federal program begun in 1995 for low-income pregnant women and families with infants and toddlers, was evaluated through a randomized trial of 3,001 families in 17 programs. Interviews with primary caregivers, child assessments, and observations of parent-child interactions were completed when children were 3 years old. Caregivers were diverse in race-ethnicity, language, and other characteristics. Regression-adjusted impact analyses showed that 3-year-old program children performed better than did control children in cognitive and language development, displayed higher emotional engagement of the parent and sustained attention with play objects, and were lower in aggressive behavior. Compared with controls, Early Head Start parents were more emotionally supportive, provided more language and learning stimulation, read to their children more, and spanked less. The strongest and most numerous impacts were for programs that offered a mix of home-visiting and center-based services and that fully implemented the performance standards early. ((c) 2005 APA, all rights reserved).

4. Pinto-Martin JA, Dunkle M, Earls M, Fliedner D, Landes C. Developmental stages of developmental screening: steps to implementation of a successful program. *American Journal of Public Health*. 2005; 95:1928-1932.

Abstract

Through the use of 2-stage screening strategies, research studies have shown that autism spectrum disorders and other developmental disabilities can now be detected reliably and with greater validity and in children as young as 18 months of age. Screening and diagnostic practices in the medical and educational arena lag far behind clinical research, however, with the average patient age at time of diagnosis being 3 to 6 years. We discuss the challenges of instituting universal developmental screening as part of pediatric care and present 2 models of existing or planned programs of early screening for autism spectrum disorder and developmental disability (1 in a community-based setting and 1 in a pediatric setting), and discuss the pros and cons of the different strategies.

5. Sand N, Silverstein M, Glascoe FP, Gupta VB, Tonniges TP, O'Connor KG. Pediatricians' reported practices regarding developmental screening: do guidelines work? Do they help? *Pediatrics*. 2005;116:174-179.

Abstract

BACKGROUND: In 2001, the American Academy of Pediatrics (AAP) adopted a policy that all infants and young children should be screened for developmental delays at regular intervals. The policy statement promoted the use of valid reliable instruments. It is unknown, however, what proportion of pediatricians follow this recommendation and whether such a practice is associated with improved identification of children with developmental difficulties. **OBJECTIVES:** To describe the use of developmental screening tests among board-certified pediatricians practicing general pediatrics and to determine the association between standardized screening and the self-reported identification of children with developmental difficulties. **METHODS:** We mailed a survey to a random sample of AAP members. We used multivariate logistic/linear regression analyses to determine the association between standardized screening and the self-reported identification of children with developmental disabilities. **RESULTS:** Of the 1617 surveys mailed, 894 were returned, for a response rate of 55%. Of the respondents, 646 practiced general pediatrics and were included in the analysis. Seventy-one percent of those pediatricians indicated that they almost always used clinical assessment without an accompanying screening instrument to identify children with developmental delays. Only 23% indicated that they used a standardized screening instrument. The most commonly used instrument was the Denver II. Logistic regression modeling demonstrated odds ratios between 1.71 and 1.90 for a >10% rate of identification of developmental problems among patients of pediatricians reporting standardized screening. Each adjusted odds ratio bordered on statistical significance. Linear-regression models estimating the difference in mean proportions of children identified with developmental problems across screening groups failed to show a statistically or clinically significant difference in physician-reported identification rates. **CONCLUSIONS:** Our findings indicate that, despite the AAP policy and national efforts to improve developmental screening in the primary care setting, few pediatricians use effective means to screen their patients for developmental problems. It is uncertain whether standardized screening, as it is practiced currently, is associated with an increase in the self-reported identification of children with developmental disabilities.

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6. Rydz D, Shevell MI, Majnemer A, Oskoui M. Developmental screening. [Review] [124 refs] *Journal of Child Neurology*. 2005;20:4-21.

Abstract

An estimated 5 to 10% of the pediatric population has a developmental disability. The current strategy to identify these children is through developmental surveillance, a continuous procedure in which the health professional observes the infant, takes a developmental history, and elicits any concerns that the caregiver might have. However, identification of delayed children is ineffective when based solely on routine surveillance. A necessary adjunct is developmental screening: the process of systematically identifying children with suspected delay who need further assessment. Screening tests greatly improve the rate of identification. With the advent of intervention programs and the support of organizations such as the American Academy of Pediatrics, the topic of developmental screening is a timely and essential one. This review aims to describe the properties of screening tests, to evaluate the available tools for developmental screening while providing a representative sample of the currently available developmental tests, and, finally, to evaluate the efficacy of intervention programs, a needed prerequisite to justify screening. [References: 124]

7. Zuckerman B, Parker S, Kaplan-Sanoff M, Augustyn M, Barth MC. Healthy Steps: a case study of innovation in pediatric practice. *Pediatrics*. 2004;114:820-826.

Abstract

Healthy Steps (HS) represents a significant innovation in the way pediatric primary care can be delivered. Based on the standards and principles of Bright Futures and the American Academy of Pediatrics Health Supervision Guidelines, HS enhances and expands traditional pediatric care by including a child development specialist (Healthy Steps specialist) as part of the pediatric practice team. Services offered by this person, typically a nurse, early childhood educator, or social worker, include more time to spend discussing preventive issues during well-child visits, home visits, a telephone information line exclusively addressing developmental and behavioral concerns, new written materials, and more seamless linkages to community resources and parent support groups. The original HS cohort consisted of 15 pediatric practices in a variety of settings (private practices, health centers, pediatric training programs). Evaluated for the effects of HS on their family were 3737 intervention and comparison families. HS families received significantly more preventive and developmental services, compared to families in the control group. HS families were also less likely to be dissatisfied with their pediatric primary care. Additionally, HS had a positive impact on parenting in many areas including adherence to health visits, nutritional practices, developmental stimulation, appropriate disciplinary techniques, and correct sleeping position. Other outcome measures (such as initiation or duration of breastfeeding, child development knowledge, sense of competence, and reports of child language development at 2 years of age) did not differ between intervention and comparison group. Compared to other early childhood intervention efforts, HS offers a comparable positive impact on parenting at a relatively inexpensive cost: an estimated 400 dollars per family per year (compared to 4500 dollars from Early Head Start). Approximately 3 years after the evaluation of HS ended, 10 of the original 24 sites are still in operation, and an additional 24 sites have started up. Although funding and reimbursement remain an important barrier, continued growth of HS suggests an abiding interest in this approach to expand and enhance preventive and developmental care in pediatric primary care.

8. Minkovitz CS, Hughart N, Strobino D, Scharfstein D, Grason H, Hou W, Miller T, Bishai D, Augustyn M, McLearn KT, Guyer B. A practice-based intervention to enhance quality of care in the first 3 years of life: the Healthy Steps for Young Children Program. *JAMA*. 2003;290:3081-3091.

Abstract

CONTEXT: There is growing concern regarding the quality of health care available in the United States for young children, and specific limitations have been noted in developmental and behavioral services provided for children in the first 3 years of life. OBJECTIVE: To determine the impact of the Healthy Steps for Young Children Program on quality of early childhood health care and parenting practices. DESIGN, SETTING, AND PARTICIPANTS: Prospective controlled clinical trial enrolling participants between September 1996 and November 1998 at 6 randomization and 9 quasi-experimental sites across the United

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States. Participants were 5565 children enrolled at birth and followed up through age 3 years. INTERVENTION: Incorporation of developmental specialists and enhanced developmental services into pediatric care in participants' first 3 years of life. MAIN OUTCOME MEASURES: Quality of care was operationalized across 4 domains: effectiveness (eg, families received > or =4 Healthy Steps-related services or discussed >6 anticipatory guidance topics), patient-centeredness (eg, families were satisfied with care provided), timeliness (eg, children received timely well-child visits and vaccinations), and efficiency (eg, families remained at the practice for > or =20 months). Parenting outcomes included response to child misbehavior (eg, use of severe discipline) and practices to promote child development and safety (eg, mothers at risk for depression discussed their sadness with someone at the practice). RESULTS: Of the 5565 enrolled families, 3737 (67.2%) responded to an interview at 30 to 33 months (usual care, 1716 families; Healthy Steps, 2021 families). Families who participated in the Healthy Steps Program had greater odds of receiving 4 or more Healthy Steps-related services (for randomization and quasi-experimental sites, respectively: odds ratio [OR], 16.90 [95% confidence interval [CI], 12.78 to 22.34] and OR, 23.05 [95% CI, 17.38 to 30.58]), of discussing more than 6 anticipatory guidance topics (OR, 8.56 [95% CI, 6.47 to 11.32] and OR, 12.31 [95% CI, 9.35 to 16.19]), of being highly satisfied with care provided (eg, someone in the practice went out of the way for them) (OR, 2.06 [95% CI, 1.64 to 2.58] and OR, 2.11 [95% CI, 1.72 to 2.59]), of receiving timely well-child visits and vaccinations (eg, age-appropriate 1-month visit) (OR, 1.98 [95% CI, 1.08 to 3.62] and OR, 2.11 [95% CI, 1.16 to 3.85]), and of remaining at the practice for 20 months or longer (OR, 2.02 [95% CI, 1.61 to 2.55] and OR, 1.75 [95% CI, 1.43 to 2.15]). They also had reduced odds of using severe discipline (eg, slapping in face or spanking with object) (OR, 0.82 [95% CI, 0.54 to 1.26] and OR, 0.67 [95% CI, 0.46 to 0.97]). Among mothers considered at risk for depression, those who participated in the Healthy Steps Program had greater odds of discussing their sadness with someone at the practice (OR, 0.95 [95% CI, 0.56 to 1.63] and OR, 2.82 [95% CI, 1.57 to 5.08]). CONCLUSION: Universal, practice-based interventions can enhance quality of care for families of young children and can improve selected parenting practices.

9. King TM, Glascoe FP. Developmental surveillance of infants and young children in pediatric primary care. [Review] [36 refs] *Current Opinion in Pediatrics*. 2003;15:624-629.

Abstract

PURPOSE OF REVIEW: This article reviews the importance of appropriate developmental surveillance in early childhood, what is known about its effectiveness in current pediatric practice, and ways in which its delivery can be improved to optimize child outcomes. RECENT FINDINGS: Many infants and young children with developmental delays or risk factors for poor developmental outcomes are not identified by pediatric practitioners in a timely manner. When they are identified, they are often not referred to appropriate early intervention services or early childhood development programs. They are therefore denied the opportunity to benefit from programs documented to have long-lasting benefits for children. Structuring developmental screening around the use of validated parent questionnaires improves the rates at which children with developmental needs are appropriately identified. At the same time, lowering thresholds for referral improves the rates at which children with identified needs receive appropriate services.

SUMMARY: Pediatric practitioners are uniquely positioned to improve children's developmental outcomes through early identification and referral of children with developmental delays or risk factors for poor developmental outcomes. Unfortunately, inappropriate screening practices, high thresholds for referral, misplaced concerns about causing parental anxiety, and unfamiliarity with local resources all diminish the effectiveness with which many practitioners conduct developmental surveillance. Recent studies show that small changes in screening and referral practices have the potential to greatly improve the effectiveness of developmental surveillance. This, in turn, has the potential to improve lifelong outcomes for children.

[References: 36]

10. Szumlas GA. Development of an office-based curriculum of common pediatric primary care skills for residents. *Academic Medicine*. 2002;77:749.

Abstract

OBJECTIVE: Basic primary care skills-such as injections and hearing screening-are commonly absent from residency curricula, yet competence in these skills is required by residency accrediting organizations. To meet this need at our program, an office-based curriculum of common pediatric primary care skills was

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developed and piloted in a resident continuity practice. DESCRIPTION: Based on a needs assessment, an eight-unit curriculum was developed to teach residents basic ambulatory primary care skills. The program was designed as a skills supplement to existing primary care curricula and includes hearing screening, vision screening, developmental screening, injections, venipuncture, urinalysis, in-office rapid testing, and analysis of skin scrapings. Each unit lasted one month, using a "skill of the month" format during continuity clinic. During the month, residents received instruction and demonstration, practiced the skill, and tested to document competence. A pilot of the unit "Intramuscular, Subcutaneous, and Intradermal Injections," was conducted at the Pediatric Primary Care Center of Cincinnati Children's Hospital with 26 pediatrics residents. Fourteen residents participated in the pilot prior to testing and a comparison group of 12 was tested without the pilot experience. The pilot occurred over two weeks. The first week, a 20-minute training session was held at the beginning of continuity clinic to discuss a procedure checklist for injections and allow residents to practice with a mannequin. Throughout the remainder of the continuity clinic during the pilot, residents administered injections to their patients, following the procedure checklist and under supervision by medical assistants. At the conclusion of the second week, residents were evaluated with a written test and a practicum. The 12 residents in the control group were tested identically. DISCUSSION: This pilot demonstrated that it is feasible to teach primary care skills to residents in the office setting. In our pilot, the test group performed 61% better on a written test and 64% better on a practical test when compared with the control group ($p < .0001$). Residents who participated in the pilot felt the methods used were appropriate and effective and that the skills taught were important. Additionally, they found the pilot did not interfere with the operation of the continuity clinic. The procedure checklist proved to be an effective and simple method of instructing a psychomotor skill. Conducting the educational sessions at the beginning of clinic was difficult due to interruptions and tardiness. While other methods, such as noon conferences, may also be effective, instruction in the actual clinical setting appeared to better demonstrate the importance, practicality, and relevance of the skill. The residents were more enthusiastic during this office-based curriculum than a typical resident conference. We conclude that this model is an effective and practical method to teach primary care skills in a clinical setting. Our success with the pilot unit has been encouraging, and we plan to develop and test the remaining units of the curriculum.

11. Clemens C, Doolittle RP, Hoyle M. Kindergarten health assessment reports: what do schools really learn from them? *Clinical Pediatrics*. 2002;41:93-98.

Abstract

The kindergarten health assessment report (KHAR), mandated by most states, is used to identify children at school entry with any health problems that may interfere with school performance. The objective of this study was to review the completeness and accuracy of the reports that schools receive from health care providers. By analyzing 3,952 KHARs of children enrolled in the Guilford County (North Carolina) Public Schools during the 1999-2000 school year we found that only 20% were fully completed and only 32% recorded results of all 6 required screening tests. Results of the 3 screening tests most applicable to school readiness: vision, hearing, and developmental screening, were documented only 55% of the time. Providers failed to properly classify 75% of children who were either underweight or overweight. Abnormal vision screening results were noted in 485 (14.2%) children, of whom only 38% were recommended for follow-up. Results of vision and hearing screening were recorded in only 50% of children noted to have developmental concerns. The information recorded on the kindergarten health assessment forms is incomplete and frequently inaccurate. These findings arouse concern, given that these forms constitute the basis for school districts to identify those children who may have medical problems.

12. Flanagan O, Nuallain SO. A study looking at the effectiveness of developmental screening in identifying learning disabilities in early childhood.[erratum appears in *Ir Med J* 2001 Jul-Aug;94(7):222]. *Irish Medical Journal*. 2001;94:148-150.

Abstract

This is a retrospective study of children under six years of age referred to the Brothers of Charity Early Intervention Services in County Galway, a service that caters for children under 6 years with learning disabilities. The aim in doing this study was to assess the value of routine developmental screening in identifying children with learning difficulties. This study also investigates the patterns and sources of referral to the remedial services provided by the Brothers of Charity and highlights possible avoidable

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delays in referral. The results showed that many children were referred for remedial services late. The reasons for late referral included late identification of some children with problems, insufficient coordination of community-based services and a lack of awareness of the importance of early intervention in some cases. As some communication disorders such as autism, autistic spectrum disorders and specific language delay may not express themselves until the later part of the second year of life, the 18-24 month developmental assessment is of vital importance. However identification of these disorders can present difficulties and may call for additional training for professionals involved in the developmental screening of children in that age group. The interval between initial identification and referral for remedial care in many cases was more than twelve months. We propose that, in order to minimize this time, children requiring a more in-depth assessment should be assessed by a community-based multidisciplinary team, enabling integrated assessment by the different disciplines and thus speedier referral to remedial services.

13. Minkovitz C, Strobino D, Hughart N, Scharfstein D, Guyer B, Healthy Steps Evaluation Team. Early effects of the healthy steps for young children program. *Archives of Pediatrics & Adolescent Medicine*. 2001;155:470-479.

Abstract

OBJECTIVE: The Healthy Steps for Young Children Program (HS) incorporates early child development specialists and enhanced developmental services into routine pediatric care. An evaluation of HS is being conducted at 6 randomization and 9 quasi-experimental sites. Services received, satisfaction with services, and parent practices were assessed when infants were aged 2 to 4 months. **METHODS:** Telephone interviews with mothers were conducted for 2631 intervention (response rate, 89%) and 2265 control (response rate, 87%) families. Analyses were conducted separately for randomization and quasi-experimental sites and adjusted for baseline differences between intervention and control groups. Hierarchical linear models assessed overall adjusted effects, while accounting for within-site correlation of outcomes. **RESULTS:** Intervention families were considerably more likely than controls to report receiving 4 or more developmental services and home visits and discussing 5 infant development topics. They also were more likely to be satisfied and less likely to be dissatisfied with care from their pediatric provider and were less likely to place babies in the prone sleep position or feed them water. The program did not affect breastfeeding continuation. Differences in the percentage of parents who showed picture books to their infants, fed them cereal, followed routines, and played with them daily were found only at the quasi-experimental sites and may reflect factors unrelated to HS. **CONCLUSIONS:** Intervention families received more developmental services during the first 2 to 4 months of their child's life and were happier with care received than were control families. Future surveys and medical record reviews will address whether these findings persist and translate into improved language development, better utilization of well-child care, and an effect on costs.

14. Guyer B, Hughart N, Strobino D, Jones A, Scharfstein D. Assessing the impact of pediatric-based development services on infants, families, and clinicians: challenges to evaluating the Health Steps Program. *Pediatrics*. 2000;105:E33.

Abstract

BACKGROUND: Begun in 1996, the Healthy Steps for Young Children Program (HS) is a new model of pediatric practice that incorporates child development specialists and enhanced developmental services for families of young children. HS is for all families, not just those at high-risk. It is expected to strengthen parents' knowledge, attitudes, and behaviors in ways that promote child health and development, and in turn, to lead to improved child outcomes, such as improved language development, increased utilization of well child care, and decreased problem behaviors, hospitalizations, and injuries. The HS evaluation is designed to assess whether HS is successful in achieving the desired outcomes, measure the program's costs, and determine the relation of the program's costs to its outcomes. **OBJECTIVE:** This article is the first report of the HS evaluation. It describes the evaluation design and characteristics of the HS sites and sample for the evaluation. **METHODS:** The evaluation is following a cohort of children from birth to age 3 at 15 evaluation sites across the country. The sites represent a range of organizational practice settings that include group practices, hospital-based clinics, and health maintenance organization pediatric clinics. The evaluation design relies on 2 comparison strategies. At 6 randomization design sites, 400 children were randomized to the intervention or control group. At 9 quasi-experimental design sites, a comparison

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location with a similar organizational setting and patient profile has been selected and up to 200 children are being followed at each of these sites. At each site, 2 developmental specialists (or their full-time equivalents) work as a team with 4 to 8 pediatricians and pediatric nurse practitioners. The specialist conducts office visits (jointly or sequentially with the pediatric clinician) and home visits, assesses children's developmental progress, provides referrals and follow-up to resources in the community, organizes and conducts parent discussion groups, coordinates early reading activities, and maintains a telephone information line for questions about child development and behavior. The evaluation relies on many data sources including self-administered provider surveys, key informant interviews, forms completed by parents at office visits, telephone interviews with parents, medical record reviews, data from each site on program costs and health services use, and an ongoing log of family contacts maintained by each developmental specialist. Analyses for this article are based on enrollment data for the Healthy Steps sample and national data on 1997 US live births. The chi² goodness-of-fit test was used to evaluate whether the distribution of selected demographic variables, insurance, and infant's birth weight for the Healthy Steps sample was similar to the distributions for US births in 1997. In addition, comparisons were made between intervention and comparison families at the randomization and quasi-experimental evaluation sites. The chi² test of independence was used to evaluate differences in variables across groups. RESULTS: Throughout a 26-month period, 5565 children enrolled in the evaluation, 2963 (53.2%) children in the intervention group and 2602 (46.8%) in the comparison group. More than 10% of mothers in the Healthy Steps sample are teenagers; 18% have 11 years of education or less; 27% have completed college; 18% are black or African-American; slightly >20% are of Hispanic origin; 36% are single; and close to one-third used Medicaid for their prenatal care. Approximately 7% of infants were low birth weight. When compared with national birth data for the United States as a whole, the Healthy Steps sample seems similarly diverse. However, with the exception of maternal age, the distribution of variables was significantly different from the distribution for US births. There are no differences between intervention and comparison families at randomization sites on any of

15. Glascoe FP, Foster EM, Wolraich ML. An economic analysis of developmental detection methods. *Pediatrics*. 1997;99:830-837.

Abstract

OBJECTIVE: To assess the costs and benefits of various approaches to early detection of developmental disabilities. DESIGN: Cost-benefit analyses based on data from previously published studies of developmental screening tests. SETTING: General pediatric practices and day care centers. PATIENTS AND OTHER PARTICIPANTS: A total of 247 parents and their 0- to 6-year-old children-103 from day care centers and 144 from pediatric practices. MAIN OUTCOME MEASURES: Licensed psychological examiners administered a screening test of parents' concerns about children's development and one or two direct screening tests: the Denver-II and/or the Battelle Developmental Inventory Screening Test. For the day care sample, examiners also administered to each child measures of intelligence, adaptive behavior, and language. In the pediatric sample, children were administered additional assessments. At the same time, diagnostic measures were administered to a randomly selected subsample to make determinations about developmental status. Each screening method was evaluated for its short-term costs (administration, interpretation, diagnosis, and treatment) and long-term benefits (impact of early intervention on adult functioning as inferred from longitudinal studies by other researchers). RESULTS: When the long-term costs and benefits were considered, none of the approaches emerged as markedly superior to another. When viewing the short-term costs, the various screening approaches differed markedly. The use of parents' concerns was by far the least costly for physicians to administer and interpret. CONCLUSION: Physicians can incur tremendous expenses when attempting to detect children with developmental problems. Although the benefits of early detection and intervention are substantial, physicians are not well-compensated for providing a critical service to society. Health policymakers and third-party payers must reconsider their minimal investment in early detection by health care providers. Nevertheless, our findings have encouraging implications for practice, because the use of parents' concerns as a screening technique offers substantial savings over and above other methods.

16. Tsiantis J, Dragonas T, Cox A, Smith M, Ispanovic V, Sampaio-Faria J. Promotion of children's early psychosocial development through primary health care services. *Paediatric and Perinatal Epidemiology*. 1996;10:339-354.

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Abstract

The paper presents the study design of the development and organisation of an EU/WHO multicentre study on the promotion of children's early psychosocial development through primary health care services. The aim of the programme is to develop training for primary health care workers (PHCWs) that improves their ability to assess factors relevant to psychosocial development and gives them preventive approaches to foster that development, building on families' strengths. The focus is on the period from conception to the end of the second year of the child's' life. Two main components are the training of the PHCWs and the semi-structured interviews that guide the workers in practice. The training has content and structure that is feasible within primary health care resources working in collaboration with mental health services. The programme is evaluated in terms of (a) the impact of training on both the PHCWs' knowledge and attitudes with regard to infant behaviour and development, and on practice as assessed by the delivery of the semi-structured interview; and (b) the effect of the intervention on maternal well-being, infant language development and behavior, home environment and mother-infant interaction. The programme is taking place in Cyprus, Greece, the Federal Republic of Yugoslavia, Portugal, Slovenia and Turkey.