

IU-Regenstrief CHICA system improves developmental delay screening and surveillance

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Is my child lagging behind physically, mentally or emotionally? Should I be concerned? When should I ask our pediatrician about it? What can I do to help my child?

A new study from Indiana University School of Medicine and Regenstrief Institute researchers reports that a computerized clinical decision support system is helping parents answer such questions. The system, which they developed to automate pediatric care guidelines, significantly increased the number of children screened for [developmental delay](#) at 9, 18 and 30 months of age, as recommended by the American Academy of Pediatrics.

The physician decision support system also significantly improved developmental delay surveillance by eliciting concerns from parents at other visits to the pediatrician. It also increased the number of children who ultimately were diagnosed as having developmental delay and who were referred for timely services at an earlier age.

The study, which was performed at 4 primary care pediatric clinics in the Eskenazi Medical Group, appears in the September 2014 issue of *JAMA Pediatrics*.

The Child Health Improvement through Computer Automation system, known as CHICA, helps pediatricians comply with clinical guidelines for their patients in the short time allotted for preventive care. CHICA prioritizes (from among the hundreds of questions programmed into CHICA) the 20 most important questions for a specific patient based on the child's age, medical history and outcomes of past appointments. Originally paper-based, and now presented to parents on tablet computers, the English- or Spanish-language questionnaire is completed in the waiting

room before seeing the physician.

Responses to the questions are stored in the child's electronic health record. A tailored worksheet containing up to six alerts for the physician is generated for use during the visit. By personalizing and automating the patient screening process and then alerting the physician to the results, CHICA prompts the pediatrician to follow up in needed areas.

"In our experience, even though parents voice concerns, they often aren't addressed by pediatricians in an optimal manner," said study first author Aaron Carroll, M.D., M.S., professor of pediatrics and Department of Pediatrics vice chair for health policy and outcomes research. He is also director of the Center for Health Policy and Professionalism Research and a Regenstrief Institute affiliated scientist. "Screening and surveillance reassures parents and helps the child. If developmental delay is suspected, a full evaluation is done. If the child is diagnosed as developmentally delayed, CHICA helps the family get plugged into the resources their child needs. Evidence is mounting that early intervention has a positive effect on the child and subsequent school performance."

In the randomized clinical trial of 360 patients, only 24 percent receiving usual care were screened for developmental delay at the American Academy of Pediatrics-mandated ages. However 85 percent of patients were screened at these ages by physicians using CHICA with the developmental screening module.

If screening occurred, the likelihood of a positive screen was similar between the groups. According to the study, this finding implies that the number of children at risk for developmental delay was similar

between groups but that more children were picked up in the developmental screening module group because of higher screening rates. Provided by Indiana University

Only 42 percent of parents in the control clinics were asked about concerns regarding their children's development outside of the 9-, 18- and 30-month, visits while a larger number—72 percent—were queried by physicians with access to the CHICA developmental surveillance module.

In addition to developmental delay guidelines, CHICA modules focus on asthma, maternal depression, ADHD, tuberculosis and iron deficiency anemia. Guidelines for Type 2 diabetes diagnosis and management are currently being incorporated into CHICA modules.

CHICA is an extension of the Regenstrief Medical Records System, a computer-based inpatient and outpatient information system that contains more than 40 years of patient data and hundreds of millions of patient observations. RMRS includes an internationally respected physician reminder system that offers suggestions on appropriate diagnosis, tests and treatment management for each patient. Open-source CHICA has been designed to interface with any electronic medical record system.

"CHICA helps us follow evidence-based guidelines and improve delivery of the care we know we should be providing," said Stephen Downs, M.D., MS, the study's senior author and a co-developer of CHICA. Dr. Downs is the Jean and Jerry Bepko Professor of Pediatrics, director of Children's Health Services Research at IU School of Medicine and a Regenstrief Institute investigator. "The comprehensiveness of what CHICA covers makes it useful at every clinic visit from newborn through older adolescence. CHICA is ideally suited to help us help both children and parents."

More information: "Use of a Computerized Decision Aid for Developmental Surveillance and Screening: A Randomized Clinical Trial" *JAMA Pediatrics*, 2014.

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