MedicalXpress

Pediatric preventive care guidelines need retooling for computerized format, study shows

July 29 2014

With the increasing use of electronic medical records and health information exchange, there is a growing demand for a computerized version of the preventive care guidelines pediatricians use across the United States. In a new study, researchers from the Indiana University School of Medicine and the Regenstrief Institute report that substantial work lies ahead to convert the American Academy of Pediatrics' Bright Future's guidelines into computerized prompts for physicians, but the payoff has the potential to significantly benefit patients from birth to age 21.

"In addition to covering an age range with wildly varying health needs, the Bright Futures guidelines cover a wide range of topics, from infant car seats to substance use," said S. Maria Finnell, M.D., M.S., assistant professor of pediatrics and a Regenstrief Institute affiliated scientist who is the study's first author. "A computerized Bright Futures would help pediatricians provide better care at the point of delivery.

"A major advantage would be the ability to generate clinical decision prompts using a child's age and gender and track what services have already been delivered to the child and which have not."

Bright Futures consists of a multitude of health supervision recommendations for children from birth through 21 years of age—from recommended shots for newborns to interventions for childhood bullying

to risk assessments for sexually transmitted diseases for adolescents.

Currently, Bright Futures is not organized to easily translate into computerized prompts. Recommendations are listed according to what should happen at each visit, which assumes the child will be seen for health supervision at each age and that previous visits have been completed. However, children may miss or have delayed visits to their physician.

A child scheduled for an annual well visit may present with an illness or concern that takes up most of the visit time, leaving some or all health supervision topics unaddressed. For example, the doctor may focus on a child's earache rather than discussing with the parent whether the child is exposed to second-hand smoke in the home. If a clinician is not able to address a recommendation at the age scheduled, he or she has to consider whether to do so at a later visit or to skip.

By consolidating recommendations and vague constructions that were repeated across visits or consisted of many smaller actions, the researchers reduced the total number of recommendations from a daunting 2,161 to a more manageable 245. However only 1 in 5 of these 245 was actionable and thus could be converted to prompts in an electronic medical record system.

"Decidability—when I am supposed to take action—and executability—what action should be taken—are key to computer decision support," said Stephen M. Downs, M.D., M.S., senior author of the study. "So extensive work will be needed to prepare the Bright Future guidelines for electronic medical record systems.

"Many of these guidelines are vague, making them difficult to translate into computerized format. For example, a statement like: 'inhaled steroids may be useful in severe asthma' is not instructive. The precise

and clear language needed for conversion to electronic prompts would include the recommended dose type, amount and frequency, as well as a definition of what constitutes severe asthma."

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. He is a co-developer of the Child Health Improvement through Computer Automation system. Known as CHICA, the computer-based decision support system was created by IU and Regenstrief Institute researchers to deliver personalized evidence-based recommendations to the child's physician at the time and point of care.

The new study, "Actionable Recommendations in the Bright Futures Child Health Supervision Guidelines," appears in the current issue (vol. 5; issue 3) of the peer-reviewed journal *Applied Clinical Informatics*. In addition to Drs. Finnell and Downs, Jennifer L. Stanton, MPH, of the IU School of Medicine's Department of Pediatrics is a co-author. The work was funded by the Indiana University Health Values Fund for Research, "Prioritization of Preventive Pediatric Services."

"Preventive pediatric services are important but easily pushed aside by urgent patient problems or parent concerns," Dr. Downs said. "Having computerized reminders of evidence-based guidelines when and where they are needed can improve the care that pediatricians provide to their patients. It's time to roll up our sleeves and make that possible."

Provided by Indiana University

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