The Automated Record for Child Health (ARCH): Improving the Quality of Pediatric Primary Care

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Background. Little is known about the quality of primary care services delivered in pediatric primary care centers. Only immunizations are routinely monitored in most practices. The use of computer-based patient records in pediatric primary care centers offers the potential to improve quality in areas such as: 1) improved data quality and access; 2) prompting of clinicians; 3) improved patient education via handouts; and 4) reduction of administrative burden (forms and reminder letters). Despite these potential benefits, few pediatric practices routinely use a computer-based patient record (CPR).

System Description. During the past four years, we have developed and implemented a comprehensive pediatric CPR called the Automated Record for Child Health (ARCH). The ARCH is a pen-based application used by clinicians at the point-of-service. The ARCH also has modules for immunization tracking, hearing and vision screening, form printing, nurse-based telephone triage, abnormal result tracking, and diagnosis-based patient tracking.

The user-interface of the ARCH has been designed to reflect the traditional paper-record (Figure 1). Clinicians use pen-based video palettes with optional keyboards to record patient encounters. At the close of each visit, a personalized “Pediatric Primary Care Report Card” is printed for the child and family. The software was created by the authors using the PowerBuilder 4GL programming language (Sybase, Inc.) and an ODBC compliant database. The ARCH uses “data-driven” visit templates, allowing issue-based templates to be built quickly and easily. The software has been designed to be portable, inexpensive, and easy to maintain and has been designed for use in practices serving low-income families.

Evaluation. 2,465 children have been seen by 9 clinicians (7 MD, 2 PNP) using the ARCH as of March 1, 2000. Clinician productivity has not decreased and in most cases has increased during the implementation phase. Changes in immunization data quality and reduced administrative burden from form completion have already been presented. To evaluate changes in quality of routine health care maintenance (RHCM) we compared documentation from 242 paper-based (pre-ARCH) visits before introduction of the ARCH with 350 ARCH visits during the first 4 months of use.

History Obtained during RHCM Visits
A similar proportion of ARCH and pre-ARCH visits contained information about interim illness, diet, and at least one psychosocial issue. However, after controlling for age, ARCH visits were significantly more likely to document the presence or absence of many findings including: receipt of dental care (relative risk (RR) = 1.7), guns in the home (RR = 79), WIC enrollment (RR = 6.7), domestic violence (RR = 47), and smoking in the home (RR = 14).

Physical Exam Screening
ARCH-users were significantly more likely to screen for age-appropriate physical findings including: strabismus (RR = 1.9) and hip dysplasia (RR = 1.3).

Anticipatory Guidance
ARCH-users were significantly more likely to discuss or print advice on many guidance topics including: infant sleep position (RR = 6.2), poison center phone number (RR = 4.5), and the importance of reading to young children (RR = 3.0).

Results of further analyses of laboratory screening rates, patient knowledge and satisfaction, and provider satisfaction will also be presented and the software will be available for demonstration.

Implications. CPRs can be used successfully in busy urban pediatric primary care centers and their use can lead to substantial improvements in the quality of services delivered.

REFERENCES
Adams, WG, Conner, W, Mann, A, Palfrey, S. Immunization Entry at the Point of Service Improves Quality, Saves Time, and Is Well Accepted. Accepted for publication, Pediatrics.