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## Electronic Medical Records Improve Quality of Care in Resource-Limited Countries



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**A new study, conducted by researchers from the Regenstrief Institute and the schools of medicine at Indiana University and Moi University, is one of the first to explore and demonstrate the impact of electronic record systems on quality of medical care in a developing country.**

In a paper published in the March 2011 issue of the Journal of the American Medical Informatics Association, Martin Chieng Were, M.D., M.S., assistant professor of medicine at the IU School of Medicine and a Regenstrief Institute investigator, and colleagues report that computer-generated reminders about overdue tests yielded nearly a 50 percent increase in the appropriate ordering of CD4 blood tests. CD4 counts are critical to monitoring the health of patients with HIV and guide treatment decisions.

The research evaluating impact of just-in-time clinician support (implemented within electronic medical records) on healthcare provider behaviour and quality of care was conducted in clinics in Eldoret, Kenya. The comparative study, which is one of the first to use computer-generated clinical reminders in sub-Saharan Africa, found that clinical summaries with computer-generated reminders significantly improved clinician adherence to CD4 testing guidelines.

This work is particularly significant because of the many medical errors that occur in settings where too few skilled healthcare providers deal with a large patient population with critical illnesses. In developed countries, patients with HIV are often seen by infectious disease specialists for their HIV care. In contrast, a large number of HIV-positive patients in resource-limited countries like Kenya are taken care of by clinical officers whose level of training is similar to that of nurse practitioners. The combination of overworked staff with limited training, increasingly busy clinics, the challenges of providing chronic disease management, and the difficulty of keeping up-to-date often results in suboptimal patient care.

"We need to improve quality of care in the developing world at a time when funding for HIV and other diseases is stagnating or decreasing - which means we will have to do it with fewer personnel as the number of patients increases. Finding innovative ways to improve care within these constraints is critical. This study shows how electronic medical record systems with clinical decision support capabilities can help fill this need," said Dr. Were. In a previous study, Dr. Were and colleagues reported on approaches that can be used to successfully implement computerized clinical decision support systems in resource-limited environments.

The Academic Model Providing Access to Healthcare (AMPATH) clinics in the study employ OpenMRS, an open source electronic medical record system widely used in the developing world. AMPATH, which cares for more than 120,000 HIV-infected adults and children at 25 main clinical sites in Western Kenya, is one of Africa's largest, most comprehensive and effective HIV/AIDS control systems.

This study was primarily supported by a grant from the Abbott Fund. The U.S. Agency for International Development, as part of the President's Emergency Plan for AIDS Relief (PEPFAR), provided partial support.

In addition to Dr. Were, co-authors of "The Evaluation of Computer-generated Reminders to Improve CD4 Laboratory Monitoring" are Changyu Shen, Ph.D., William M. Tierney, M.D., Paul G. Biondich, M.D., Xiaochun Li, Ph.D., and Burke W Mamlin, M.D., all of the Regenstrief Institute and IU School of Medicine; Sylvester Kimaiyo, MB.ChB., M.Med. of Moi University School of Medicine and AMPATH; and Joseph J. Mamlin, M.D. of IU School of Medicine and AMPATH.

The Regenstrief Institute and IU School of Medicine are located on the campus of Indiana University – Purdue University Indianapolis. Moi University School of Medicine is located in Eldoret, Kenya.

Source: IU School of Medicine  
Published on : Mon, 21 Mar 2011