

Improving Access To TB Medical Records In Remote Clinics In Peru Using A Personal Digital Assistant Based Application

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INTRODUCTION

Accessing up-to-date lab results and clinical information in remote locations is a persistent and difficult problem for clinicians in the developing world. This is especially the case with regard to chronic diseases such as Multi-Drug Resistant Tuberculosis (MDR-TB). Traditional paper systems are cumbersome, difficult to access and update remotely, and fragile. A computerized Electronic Medical Record (EMR) can greatly facilitate archiving and retrieving this information ⁽¹⁾, but requires a computer and Internet access at the point of care. We have developed a PDA-based EMR for our MDR-TB program in Peru to give clinicians a low cost, portable, and robust system ⁽²⁾ fully integrated with our web-based EMR. For a fraction of the cost of a laptop computer this allows access to daily updated clinical information in a lightweight unit that can last over a month on a single set of batteries.

METHODS AND DESIGN CONSIDERATIONS

Our primary objective is to enable physicians in remote locations to access critical data, including lab results and comments generated at multiple sites in Peru and the US. By using the commercially available Avant-Go ⁽³⁾ software as a web platform we have linked the PDA-EMR with our existing web-based EMR ⁽⁴⁾. This has allowed us to construct the interface in standard HTML (using Java Server Pages). Records are updated by synchronizing the PDA to a computer that is connected to the Internet. As this system will be used for patient medical data, security is crucial. Avant-Go supports Secure Socket Layer connections, while we secure the PDA with Palm OS security software ⁽⁵⁾.

RESULTS

The current handheld/web interface allows clinicians to view clinical data summaries. Our system is based on an existing web-based EMR for our group's MDR-TB program in Lima, Peru ⁽⁶⁾. The summary includes patient demographics, current and past drug regimes, physical exams, diagnoses, lab results, drug sensitivity tests and information on X-rays. We can hold several hundred patient summaries on a handheld device with 2MB RAM. Synchronization has been successfully performed over dialup connections in Peru and South Africa. We are working to further compress the interface to fit more data onto the limited memory of a PDA and to work

in situations of limited bandwidth. Two physicians with the TB project are testing the system in Peru at present. The clinical summaries are available in both English and Spanish.

FUTURE PLANS

The most significant addition will be allowing data input on the handheld devices. We intend to allow clinicians to enter information on patient visits, treatment regimes, and adverse events. This will require a more elaborate security regime to allow secure uploads. Further refinement of the interface will make it easier to use and more intuitive. Defining an essential core dataset is a constant work in progress, as we balance constraints of memory limitations, download time and a desire for complete data. We plan to provide similar data for the nurses working in patient homes. This concept could be useful for other clinical problems in developing countries. In particular, HIV care shares many key features with MDR-TB care ⁽⁷⁾, such as duration and complexity and could be supported by a modified Web/PDA based EMR.

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