"Telemedicine Evaluation in the Pacific: "Overview and Status of the AKAMAI Evaluation Initiative"

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Abstract

Project AKAMAI is a federally funded program designed to augment health care delivery to the Department of Defense (DoD) and beneficiaries in the Pacific Basin using telecommunications technology. The AKAMAI Evaluation Initiative is a systematic evaluation of the potential contribution of telemedicine in a health care delivery system. In this study, patients are randomly allocated to usual care (UC) or telemedicine care (TC) for routine dermatology or orthopedic consultations between a primary care outpatient clinic and a tertiary care center. The automation infrastructure employs a thin client-server design and integrates existing hospital legacy systems and image servers on a secure network. The overall study investigates four areas of interest (Clinical Outcomes, Patient/Provider Satisfaction, Organizational Impact, and Cost/Effectiveness). The objective is to provide healthcare policy-makers with scientific and technical information and provide a tested methodology for future evaluation of deployed DoD telemedicine systems in the Pacific.

I. Introduction

Since the 1960s, there have been numerous attempts to advance telecommunications technology to augment health care delivery. Yet, despite the simplicity and apparent logic of the concept and three decades of experience, we are unable to show that telemedicine improves access, reduces cost, or affects the quality of health care. There are few well-designed studies and generalizing the findings to the military health care system and patient populations may not be valid. Consequently, there is clearly a need for well-designed research in this area. The current research program is an evaluation initiative within the AKAMAI project. AKAMAI is a Federally funded program designed to augment health care delivery to DoD and beneficiaries in the Pacific Basin using telecommunications technology. The AKAMAI Evaluation Initiative is a systematic evaluation of the potential contribution of telemedicine technologies and processes in a health care delivery system.

II. Description

The Evaluation effort consists of four projects that address the following domains: Clinical Outcomes; Patient/Provider Satisfaction; Organizational Impact; and Cost/Effectiveness. The protocol employs a randomized design to compare patient and process outcomes of two methods of consultation (telemedicine and usual care) in the areas of dermatology and orthopedics. The sample population for this study is active duty and retired military and their dependents requiring consultation from a primary care (Hickam) to a tertiary care (Tripler) facility and their health care providers. In this prospective study, patients are randomly allocated to usual care (UC) or telemedicine (TC) for routine dermatology or orthopedics consultations between a primary care outpatient clinic and a tertiary care center.

To assess the impact of this change in health care, measures of structure, process and clinical outcome are performed over a 90 day period from the date of consultation. Data analysis will include descriptive and analytical statistics, and construction of medical models based on individual patient trajectories. The automation infrastructure for the study employs a thin client server design and integrates existing hospital legacy systems and image servers on a secure network. Health care providers access the AKAMAI server using a web browser and use predefined clinical protocols defining Hx, PE, labs and images for problem oriented consultation.

III. Objectives

The objective of the overall project is to provide a scientific evaluation of outcomes resulting from insertion of telemedicine into a primary care clinic that routinely refers patients to a tertiary medical care center. Objectives of the four individual research domains are: 1) to investigate if telemedicine consultation between medical treatment facilities: (a) impacts the clinical outcome of patients compared to usual care; (b) affects patient and provider satisfaction compared to usual care and (c) reduces cost in relation to benefits compared to usual care; 2) to investigate the organizational changes that occur when
telemedicine is implemented in a medical treatment facility.

IV. Current Status

Clinical Outcomes: Significant progress has been made in establishing an infrastructure for transmission of consult data (Theater Telemedicine Prototype). A Web-based paradigm will be used. Specialists from Dermatology and Orthopedics have reviewed and participated in developing screens in their areas. A 'patient trajectory analysis' has been established as a major analysis tool for this evaluation project. The overall detailed data collection procedure and high level process diagram have been completed. Once the infrastructure is operational, procedures, systems, and team coordination will be tested and refined. After refinement, data collection, patient follow-up, and data analysis will commence.

Patient/Provider Satisfaction: Once the systems for telemedicine consultation are operational for at least 2 to 3 months, focus groups evaluating patient and provider satisfaction will be conducted. Arrangements are currently underway to conduct the preliminary focus groups.

Organizational Impact: An inventory has been identified which measures cognitive perceptions of the caregivers job characteristics. The medical decision making process has been identified as the variable to be measured and qualitative research methodology of ethnography has been adopted as the operative tool. An inventory assessing organizational learning has been chosen as the measuring instrument. Currently, the team is finalizing evaluation instruments and preparing procedures to test these instruments prior to data collection.

Cost-Effectiveness: Currently, refinement of an initial cost/benefit model is underway based on a high-level process flow diagram for the telemedicine consults. The cost/benefit model will continue refinement through the training phase.

V. Significance

Before telemedicine consultations are used as a substitute for usual care in which the patient and consultant meet in a clinical encounter, we must demonstrate through objective and measurable outcomes the equivalency of both methods of consultation in providing health care.

Successful completion of the AKAMAI evaluation effort will (1) provide health care policy-makers with scientific information to assist them in the decision to augment DOD medical treatment facilities in the Pacific Basin with telemedicine technology; (2) provide a methodology for comprehensive evaluation of future DOD deployed telemedicine systems.

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