"An Overview of the AKAMAI Telemedicine Project: A Pacific Perspective"

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Abstract
Project AKAMAI is a congressionally mandated, Department of Defense (DOD) medical research and development program sponsored by Tripler Army Medical Center (TAMC), aimed at applying and assessing the value of telemedicine technologies. Located in the Pacific Region, the project faces the challenge of extreme distances and significant time zone differences. Project AKAMAI is committed to applying emerging technology with a clinical focus to enhance telemedicine and projecting the medical specialty expertise of Tripler to remote sites in the Pacific. This project has significant readiness and humanitarian implications in the region. TAMC is conducting ongoing telemedicine operations supporting the Federated States of Micronesia, Marshall Islands, Palau, Schofield Barracks, Honolulu VA, Hickam Air Force Base, Diego Garcia and multiple DOD sites in Korea and Japan. Additionally, AKAMAI is engaged in a variety of clinical research projects utilizing emerging technologies. Project AKAMAI is the definition phase of an eventual virtual hospital network servicing the entire Pacific Region, and is working to verify a vision for 21st Century health care delivery.

I. Background

Project AKAMAI is a Tri-Service Department of Defense health project, sponsored by Tripler Regional Medical Center (TRMC), aimed at applying and assessing the value of telemedicine technologies in the Military’s Pacific region health care system. Since the inception of AKAMAI, significant strides have been made and experience gained. TRMC has achieved a level of 95% digital imaging; is conducting ongoing telemedicine operations supporting Bosnia, Civil Action Teams in Korea, the Federated States of Micronesia, Marshall Islands, Johnson Atoll, and Hickam Air Force Base and is engaged in a variety of clinical research projects utilizing advanced telecommunications technologies.

II. Department of Defense Position

The AKAMAI project enhances the health care delivery system and improves military readiness in the Pacific Basin Region by projecting the medical specialty expertise of Tripler Regional Medical Center (TRMC) to remote sites through the use of advanced medical technologies and telecommunications capabilities. Located in the Pacific Region, the AKAMAI Project faces the challenge of extreme distances and significant time zone differences. This project has significant readiness and humanitarian implications in the region.

III. AKAMAI Highlights

The following list briefly highlights the on-going operation initiatives of the AKAMAI Program:

Teleradiology: Tripler has finalized the Medical Diagnostic Imaging Support (MDIS) system which provides picture archiving and communications (PACS) functionality to support film independent operations at Tripler and teleradiology operations with remote sites. Specific teleradiology progress is reviewed below:

• Digital Radiography at Elmendorf: This effort establishes Digital Radiography technologies and equipment at the 3rd Medical Group at Elmendorf Air Force Base, Alaska. An initial capability has been installed in the existing facility. A complete system will be installed in the new facility scheduled after FY 1999.

• The Alaska Federal Consortium: AKAMAI is coordinating with the Alaska Federal Health Care Partnership to build a virtual radiology service. In this manner, all partners are taking advantage of the economies of scale from sharing of personnel, equipment and communications networks in the implementation of computer radiography.

• Image Distribution on Local Area Networks: This uses developed technology to support the distribution of radiographic images to all clinicians on the existing local area networks. The technology is provided throughout the hospital using desktop personal computers instead of the much more expensive dedicated high resolution work stations.

• Tripler’s Satellite MDIS Sites: Computed Radiography has been operational at Hickam Air Force
Base for approximately three years. The same capability has been installed at Schofield Barracks and will be operational in July of 1998.

**AKAMAI Telemedicine Evaluation:** This comprehensive research protocol evaluates the impact of telemedicine technology on a health care delivery system. Telemedicine prototype solutions are developed utilizing the delivery process to measure the effect of a telemedicine system to an applied clinical protocol. Assessment is focused on clinical outcomes, organizational impact, patient/provider satisfaction, human factors, and cost effectiveness.

**Pacific Area Needs Assessment:** Assessment surveys aimed at all DOD facilities within the region to document referral patterns, provider perceptions, prevailing attitudes and perceived needs of providers at potential telemedicine sites are needed. Results of the assessment will be utilized to verify, prioritize and direct telemedicine efforts in the Pacific area.

**Hyperspectral Diagnostic Imaging:** This is a means of performing non-evasive surgery by using Hyperspectral Fluorescent Imagery to depict cancerous cells within the body. This project is investigating the use of cervical topography with comparison to Pap smear results and cervical histopathology. The pattern of fluorescence images varies depending on whether the tissue is normal or diseased. Analysis of the pattern may reveal diagnosis. If successful, this non-contact, non-painful procedure could replace the need for cervical biopsies in women with abnormal Pap smears. Women could be screened and diagnosed at the same visit.

**Pacific Island Healthcare Project:** This project utilizes a web-based consultation and referral network for clinicians in the former US Trust territories in the Pacific. Case studies are reviewed with supporting digital imagery. Initial anecdotal data establish the dire need for tertiary care consultation and increased dialogue for remotely located clinicians. The project is investigating electronic triage, diagnosis, treatment recommendations, referral preparation and follow-up. Additionally, the project is exploring the use of the Internet in CME/GME, by presenting interesting cases electronically for remote providers.

**Internet Tumor Board:** The Internet has been used for presentation of remotely located oncology patients within Department of Defense for Tumor Board consultation prior to patient evacuation. This Health Affairs funded project is conducted in partnership with AKAMAI and has established new procedures for both presenting physicians and oncology specialists who review the case electronically prior to the Tumor Board discussion. Additionally, all Tumor Board participants are eligible for CME/CEU.

**Theater Telemedicine Prototype Project (T2P2):** The T2P2 is a consult-driven, web-based application that supports the clinical consultation process. The system integrates data from supporting clinical information sources like CHCS and radiology image servers, to the referral location over low bandwidth connectivity for clinical referrals in dermatology and orthopedics.

**IV. Conclusion**

Project AKAMAI is committed to applying all advanced technology with a clinical focus to enhance telemedicine and projecting the medical specialty expertise of Tripler Army Medical Center to remote sites in the Pacific. Project AKAMAI is the definition phase of an eventual virtual hospital network servicing the entire Pacific Region and is working to verify a vision for 21st Century medical support.

The views expressed in this presentation are those of the authors and do not reflect the official policy or position of the Department of the Army, Department of Defense, or the U.S. Government.