The PBMA and telemedicine in the Pacific: the first steps

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Introduction

In April 1995 at the Charter Conference of the Pacific Basin Medical Association (PBMA) in Pohnpei, Col. Donald Person, Chief of Paediatrics, Tripler Army Medical Center (TAMC), and Maj. Scott Norton, a TAMC dermatologist, gave introductory presentations describing the activities of TAMC's Pacific Island Referral Program and its Telemedicine Clinic[1,2,3].

In an effort to enhance the postgraduate medical training program at TAMC, a major residency teaching hospital for the US Army in Honolulu, funding for the TAMC Pacific Islands Referral Program was appropriated by the US Congress to fund off island medical evacuation of select tertiary care medical and surgical cases from the US-Associated Pacific Islands[4,5,6]. It became clear, from the volume and the nature of referral cases from the jurisdictions, that a better communications system was needed to not only follow-up on TAMC-treated patients who had returned to their jurisdictions, but also the need to develop a process to provide timely Distance Medical Consulting (DMC) to physicians on isolated Pacific islands. The hope was that such timely communications would provide valuable DMC for critically ill patients, decrease the sense of professional isolation of island physicians, and help to prevent costly off island medical referrals (OIMR). The expense of OIMR, which provides tertiary care services for less than 1% of the population, exceeds 25% of total health care budgets of many of these developing countries where primary and secondary health care systems are underdeveloped and the lack of essential drugs, supplies, and services is commonplace.

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Telemedicine and medical consultation

TAMC's Telemedicine Clinic was initially established to support the DMC needs of the U.S. Army's Kwajelein Missile Range Hospital (KMRH) in the Republic of the Marshall Islands (RMI). A highly technical real time video/audio communications system was established whereby TAMC physicians routinely assisted KMRH physicians who were managing complicated medical and surgical cases via long distance interactive video communications. This process provided effective DMC and prevented many medical evacuations from KMRH to TAMC 2,000 miles away. The real time system, although very effective, depended upon sophisticated satellite and earth station communication systems, expensive computer and video hardware, and costly maintenance. This system might work on Kwajelein, a major US Army installation, but it clearly was not the communications model for the many isolated islands of the Freely Associated States (FAS) of the Republic of the Marshall Islands, the Federated States of Micronesia, and the Republic of Palau where per capita incomes for 90% of the population countries under $2,000[7].

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CASE REPORTS AND SHORT COMMUNICATIONS

Table 1. Select Telemedicine demonstration activities

Event and date	Locations
Distance medical consulting	
1st Pacific Basin Medical Association Conference, April 3, 1995	International: Pohnpei and Palau, 1,200 miles apart
Paediatric X-ray consulting: TAMC and PBMOTP, May 5&12 1995	International: Honolulu and Pohnpei, 3,000 miles apart
Emergency X-ray consultation between Kosrae State Hospital and Kosrae, PBMOTP, May 24, 1995	Interisland: Pohnpei
Dermatology consultation: chronic dermatitis lesions in a 8 y.o. PBMOTP staff to TAMC dermatologist, August 9, 1995	International: Pohnpei and Honolulu
Distance continuing education	
PMBA Conference: "HIV in the Pacific - 1995" by Dr A. Johnson, Director, TAMC HIV Clinic, Honolulu, April 3, 1995	International: Honolulu to Pohnpei
PBMOTP Director's Rounds: "loss of consciousness in the pepper fields", April 8, 1995	International: Pohnpei - Nett to Pohnlangas Dispensary
PBMOTP Director's Rounds: "Management and Treatment of Leprosy", by WHO Consultant Dr. C. Revankar, May 25, 1995	Interisland: PBMOTP, Pohnpei to Kosrae State Hospital
Lecture: "Management and Treatment of Leprosy" by Dr J. Malani, Associate Director, PBMOTP, to Annual Waianae Primary Health Care Conference, Oahu, Hawaii, June 7, 1995	International: Pohnpei and Hawaii
Lecture: "Telemedicine Demonstration Projects in the Western Pacific" by Dr G. Dever, Director, PBMOTP, to Western Alaska Telemedicine Conference, Nome, Alaska, July 7, 1995	International: Pohnpei to Alaska

At the PBMA Charter Conference Drs. Person and Norton, along with the Telemedicine Clinic Director, Maj. Craig Floro, and technician Sgt. Mike Philpotts, demonstrated the utility of the Picasso Still Image Phone [8] which, when attached to a camcorder and a television monitor, could readily capture, store, send, and receive high quality colour still image video pictures transmitted with simultaneous audio, over commercial telephone lines. Before the PBMA audience, Dr. Person, a paediatric rheumatologist, demonstrated his ability to communicate from Pohnpei via the Picasso Phone to a physician in Palau who, using a similar unit, transmitted to Dr. Person in Pohnpei still image video pictures of a Palauan patient with systemic lupus erythematosus who was scheduled to leave for Honolulu to be seen by Dr. Person at TAMC - 5,000 miles away. Dr. Person, in speaking over the Picasso Phone to both the local physician and his patient in Palau and from observing the multiple still image videos of the patient, advised his colleague in Palau to reduce the patient's oral prednisone dosage and decided, from what he observed, that the patient did not need to be medically evacuated to Hawaii - a cost savings of about $10,000.

Continuing medical education

Following this DMC demonstration, TAMC physician Arthur Johnson, the Director of the TAMC HIV Clinic, gave a 45 minute interactive distance continuing education (DCE) lecture on "HIV in the Pacific - 1995" from his clinic in Honolulu to the assembled PBMA conferees in Pohnpei[2].

Over the next 18 months, with donated Picasso Phones from AT&T, and the medical and technical back up of TAMC's Telemedicine Clinic, the University of Hawaii's Pacific Basin Medical Officers Training Program (PBMOTP) initiated a series of telemedicine demonstration projects (See Table 1) to test and document the utility, ease, and appropriateness of such technology for both distance medical consulting and distance continuing education for island states which have access to commercial phone systems[9-11]. In over 30 demonstration DMC and DCE activities of international, interisland, and intercommunity telemedicine communication, the PBMOTP, which was the originating Secretariat for the PBMA, gained the confidence and capacity with this new technology and process to recommend to the PBMA that it initiate next step planing activities needed to capture the resources needed to implement a region-wide telemedicine network to support the isolated health workforce in the Western Pacific[12,13].

Before Telemedicine

The Pacific has a long experience in the use of distance education and communication technology. In the 1960's the Peacesat network was used for the health and other sector, audio-teleconferences. The network extended from Seattle, Honolulu through the Pacific to Sydney and Wellington. In the 1970's the University of the South Pacific (USP) in Fiji became the hub of the Pacific distance education via satellite audio communications line. The Suva-based university was linked to radio terminals in up to 11 countries. Undergraduate degree and continuing education courses were delivered through a combined print and teleradio medium.

This distance education experience has since added various initiatives including computer linkages, slow scanning television capability and more extensive and comprehensive radio-telephone systems. Existing capability has allowed the development of broader distance education activities. In the Pacific this development has been at the global level (e.g. USP Net, the Guam/Palau Nurse Training and the Commonwealth of Learning) and at the national level (e.g. central hospitals and outlying clinics).

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In days gone by the use of VHF radio was the central communication technology. Even today the VHF radio and/ or telephone still provide the only mechianism for distance education and clinical consultations. The VHF radio or telephone linking the central hospital to outlying clinics is still the mainstay for communications in many Pacific countries. Even in Australia the remote health services and the Royal Flying Doctors still rely on VHF radio and telephone for 24-hour clinical consultation and guiding remote clinical staff through emergency procedures (e.g. insertion of chest tubes and suprapubic uninary catheters). In Hawaii the training of nurses and doctors has incorporated audiovisual telecommunication into the Ke Ola Project[16]. There is now also a Japanese telemedicine network which incudes some Pacific countries in its footprint (e.g. Papua New Guinea).

Where to with Telemedicine?

At the third PBMA Conference the PBMA membership gave its Secretariat the mandate to begin the planning process to develop a telemedicine network for the region. With the closing of the PBMOTP, the Micronesia Human Resource Development Center assumed the PBMA Secretariat responsibilities and has commenced a regional telemedicine planning process. As envisioned, the telemedicine network would be primarily directed at the less developed country members of the US-Associated Pacific Islands who would link into tertiary care and educational resources at TAMC, the John A. Burns School of Medicine, the Pacific Postgraduate Medical Center at the Fiji School of Medicine [14,15], and other resource centers within the region. The network will include e-mail and still image video/audio capacity that fit within the communication and financial resources of the island countries that it serves. With time, it is envisioned that such improved communications will contribute to decreasing the professional isolation of the regional workforce and provide reliable continuing education in areas where it does not generally exist for both clinical medicine and community health disciplines. Additionally, the network will provide timely distance medical consulting to patients and hopefully prevent expensive and disruptive off island medical referrals.

With the enthusiasm for telemedicine and cyberspace technology, it must not be lost that many fundamental problems exists in the Pacific. The caution, constraints and experience of Pacific-wide computerisation[17,18] are even more applicable to cyberspace audio-visual technology. Ultimately we must examine the opportunity cost and the marginal analysis of the technology explosion with simple Pacific health questions , e.g. Is this the best and appropriate way to improve malnutrition, child health, malaria, diabetes and injury related deaths?

Technology is only as useful as the human capacity to manipulate and direct its capabilities. The "garbage in - garbage out" edict applies equally well to all cyberspace technologies. It will be another retrograde step to clutter the Pacific cyberspace with more white elephants.

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" Give me one well-trained physician of the highest type. He will do better work for a thousand people than ten specialists "

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