

The role of the Picasso phone system in distance consultation for remote Pacific islands

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Abstract

The U.S. affiliated Pacific Island nations spend an average of over 10% of total health budget on off-island referral care to tertiary centers. Tripler Army Regional Medical Center (TAMC) has been the major provider of this service for many years. Prior to 1995 communication to consultants at TAMC was by long distance telephone, fax and regular mail. Connecting to a specialist sometimes took hours and clearly a better communication link was needed. The AT&T Picasso phone, an instrument the size of a small briefcase was developed to reliably transmit still images over the regular phone. Freeze-frame images captured at the sending end by a cam recorder were transmitted to a remote receiver unit, where they were displayed and stored. A typical medical consultation involved about three images, with each transmission over the 28.8 Kbps modem taking about one minute. A separate consultation form submitted by fax to TAMC was attached to the transferred images. Four Picasso phones were used to test their usefulness in linking isolated Pacific islands to a metropolitan medical center. For the first time ever, coloured patient images, data, X-rays etc were transmitted with a faxed written medical report. The Picasso phone was the spark of the Telemedicine development in the US affiliated Pacific islands.

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Introduction

The population of the northern Pacific Islands is scattered across 104 inhabited islands covering an expanse of ocean larger than continental U.S. The health care delivery systems vary in different jurisdictions depending on the degree of political relationship with U.S. Almost all health indicators for islanders are worse than islanders in Hawaii and the U.S. mainland. Obstacles to the delivery of health care include emphasis on hospital based acute care, long distances that must be covered to provide care to remote areas, lack of trained personnel to meet the increased expectations of the community, inadequate medical facility and support system, and finally by enormous costs involved in sending patients off island for specialized care¹. In contrast to most island nations in the South Pacific, between 10–33% of the health budgets of all the U.S.-affiliated Pacific Islands are spent for off-island medical care to serve less than 1% of the total population². The enormous expenditures have not translated into measurable improvement in health status. In fact the reverse has happened as funds for primary health care, medicines and supplies are exhausted.

Fig 1. The Pacific region

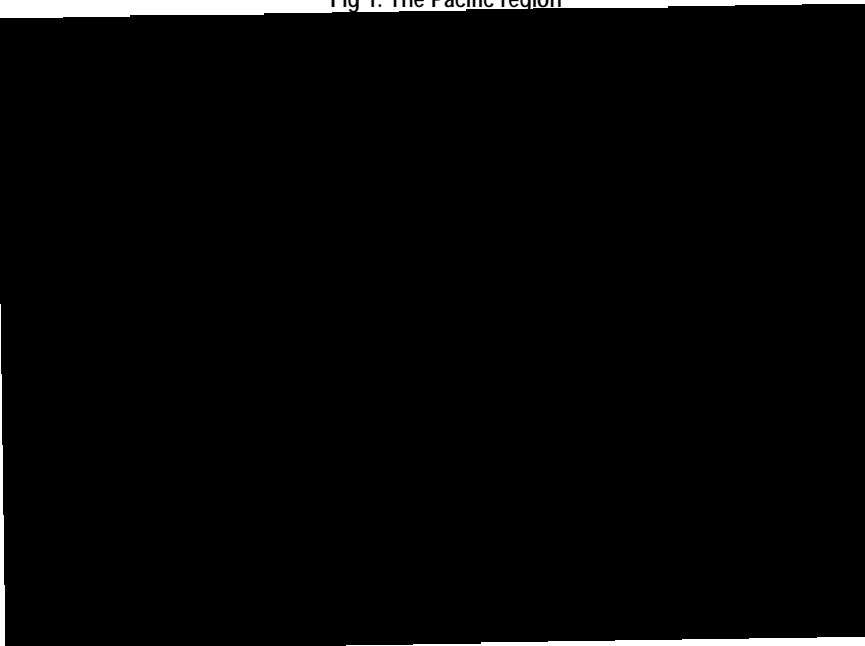


Table 1. Statistics for selected Pacific countries

Country	Total health budget (US \$M)	Per capita expenditure (US\$)	Off-island medical care (%)	Total population	Infant mortality rate /1000	Life expectancy (Years)
American Samoa	21.40	369	30	58,070	13	71
CNMI	36.20	614	19	58,846	9.3	72
Guam	81.00	510	*24	155,225	8.9	74
FSM	14.00	132	**13	105,506	46	65
Pohnpei	4.80	143	9	33,692	42	67
Chuuk	4.88	92	18	53,319	53	64
Yap	1.98	178	14	11,178	39	67
Kosrae	1.10	151	12	7,317	49	65
RMI	7.60	128	33	59,246	29	64
Palau	10.90	633	15	17,225	26	67
Fiji	19.40	24	2	810,000	18	73
W. Samoa	5.40	32	2	170,000	22	69
Vanuatu	6.15	34	0	181,000	37	65

Figures from "Health Priorities and Options in the World Bank's Pacific Member Countries 1994"

* Calculated for Medicaid Indigent Program - 163 in 96 from "Pacific Partnerships for Health"

** Average of four Federated States of Micronesia (FSM)

Figures from "A Brief Summary of the Health Priorities Seminars conducted in FSM and the Marshall Islands", Dr Joe Flear, Fr. Hezel

Population figures for US API from PIHOA (1997)

Figures for neighbour island nations taken from World Bank "Country at a Glance" sheets for 1988.

Fig. 2 and Fig. 3. The Picasso system



Fig 4. Consult Form TAMC Telemedicine Clinic

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NAME: Ms. Laila Ariyana PRACTICE: Manus - Bilim DATE: 8/16/99

MS. LAILA ARIYANA 57y/o Puaan - Danawa
from Linau. She has glaucoma and complains of diffuse scaly skin rash.

DIAGNOSIS: psoriasis - apparently not by STAFF Specialist

PHYSICIAN: L. U. Calogian

LABORATORY TESTS: serum uric acid 4.6 mg/dl (ref 2.4-6.8)
hs T4 9.9 (ref 9.3-12.7) WBC 12.0 (ref 4.0-11.0)
UPEL non-reactive
UA: 5-10 WBC Hemat 8.3%

CRK borderline normal clear lungs

Nurse: a number of months since previous treatment
with low dose of MTX favorable response but D/C'd
due to GI upset. (Managed on 5mg once weekly then 10mg once weekly)
Hypertension & diabetes (on allopurinol & 2 weeks of amoxicillin)
Pain: Uncontrolled - generally not tolerating any other
medication & also difficulty
with walking & climbing stairs
PAIN - consider GI sparing regimen (eg 100 mg) & beneficial to structural
support in psoriasis

Medication: Nizoral
Prozac
allopurinol
Colchicine

PHYSICIAN: William MAS, M.C. DATE: 23 Aug 99

ARIGATA, LAILA A6249 L. 082-0717136

453-5117

Dist: 1/2/1/99

Fig 5. Patient Image



Fig 6. Chest X-ray Image



Background

The majority of patients from the Freely Associated States who were referred off-island prior to the Compact (in 1980) went exclusively to Tripler Army Regional Medical Center (TAMC) in Honolulu and selectively through the Pacific Islands Health Care Project (PIHCP) in the Compact years. The process of transferring a patient to a tertiary medical center depended on factors on the islands and at the receiving end. The transfer barriers include different referral protocols in each jurisdiction, added expense of referral coordinating offices in Hawaii, periodic changes in TAMC specialists, uneven levels of access by island providers to the consultants. Prior to 1995 communication with consultants at TAMC involved the use of long distance telephone, faxes and regular mail. Connecting to a specialist required a sequence of events that took hours to accomplish as office workers coordinated the necessary phone transfers. Time difference, lack of infrastructure development, and frustration limited the number of these consultations to the emergency cases. There was a clear need for better coordination and communication link. See Table 1.

Method

A system "that would reliably transmit still-images over regular phone lines" could provide an improvement in the communication link³. In April 1995 Dr. Donald Person, Director of PIHCP and Dr. Scott Norton, Chief of Dermatology, TAMC presented the activities of the Telemedicine Clinic at the Charter Conference of the Pacific Basin Medical Association. Although the clinic was established to support remote military physicians in real time a similar application could be utilized in any isolated setting⁴. The AT&T Picasso Still-Image phone would perform this function. The size of a small briefcase, this product behaved like a still-image, full color, paperless FAX machine. Freeze-frame images captured at the remote sending end by a camcorder were transmitted to a central receiving unit, where they could be displayed and stored. Four Picasso Phone units were donated by AT&T to the region through TAMC to test their utility in linking isolated Pacific islands to a metropolitan medical center³. A technical demonstration by Maj. Craig Floro and Sgt. Mike Philpotts initially overwhelmed the audience when in addition to voice transmission high quality color images were transmitted over phone lines from Honolulu to Pohnpei. The potential of this system was further demonstrated as images of a patient in Palau scheduled for follow-up visit to Honolulu were reviewed by a consultant in Pohnpei. Treatment protocol was discussed with the primary physician and the patient, adjustment was made to her regimen and a follow-up visit to Honolulu was avoided⁴. A typical medical consultation involved transmission of about 3 images, each transmission over the 28.8 Kbps modem took one minute³. A separate consultation form is submitted as a faxed document to TAMC which is then attached to the transferred images and brought to the

attention of the consultant. Over the next 18 months, the Pacific Basin Medical Officers Training Program (PBMOTP) initiated a series of telemedicine demonstration projects to test and document the utility of this technology in patient care⁶. A unit donated to Palau was also utilized by local and U.S. Public Health Service Corps physicians to request consultation from TAMC specialists on EKG interpretation, X-ray readings and skin rashes. Figures 2 - 6 are examples of the Picasso consultation process.

Conclusions

The success of this Picasso Phone process involved personal dedication of individuals who saw the potential application of such technology in patient care. For the first time ever, color patient images, patient data, x-ray images could be transmitted with submission of a written medical report. 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 region⁵. The Western Pacific HealthNet is the Telemedicine Initiative of the PBMA. The mission of the WPHNet is to promote the use of appropriate communications in health. The objectives of the WPHNet include formally linking resources of health institutions, decreasing the professional isolation of the regional workforce, and providing continuing education for both clinical and community medicine⁵. Even though the Picasso Phone was discontinued in the fall of 1995, it sparked further development of Telemedicine Efforts in the U.S. affiliated Pacific Islands⁷.

References

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