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# DHP RFS Final Report



**BAMC-DACH Pediatric Sub-Specialty Telemedicine HealthCare Program  
Proposal Number: 1999000102**

**Stephen Curtis Inscore MD**

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## Abstract

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## Problems

**Tricare Region 6 Preexisting Telemedicine Model:** Tricare Region 6 solution to telemedicine was in place based on an adult telemedicine software model, Apollo/CNSI (dermatology; neurology) installed at a host of remote bases (Sheppard AFB; Dyess AFB; Corpus Chirsti NAS; Cannon, AFB; Laughlin, AFB). The Tricare lead agent paid for two additional units in San Antonio (agreement to examine regionwide pediatric patients). Pediatric inpatient and outpatient unique telemedicine solutions were not addressed by the existing software. Apollo/CNSI has continued to modify and refine the software to make it functional and subsequently more user friendly with a minimum instruction to pediatric subspecialists. The implementation of the software was delayed by building line and land line problems. In combination it took 6 months to make the system fully functional. The refinement of the software is an ongoing task.

**2. Transmission lines and network limitations.** (a) Brooke Army Medical Center(BAMC)and Wilford Hall Medical Center (WHMC) have domain compatability problems. We cannot interface the BAMC Local Area Network simultaneously with the telemedicine domain. In order to access laboratory and imaging studies we require two different computer hardware setups in the same room. This requires more desk and office space at DACH and BAMC. (b) WHMC Subspecialty Clinic has had limited functionality (see deliverables) because of narrow bandwidth assignment at USAMISSA. The sound quality and image resolution drops out in an unpredictable manner because we don't have guaranteed bandwidth. We continue to dialogue with them through CNSI contractor to get a guaranteed adequate bandwidth. (c) WHMC NICU was not properly wired by the building until 04/01. The echocardiography acuity has been severely limited by inadequate bandwidth assignment from USAMISSA and delay in getting a patchcord from the echocardiographic machine to the patient kiosk. (d) Separate server at WHMC was not on a UPS. A power outage caused a 3-day service outage. A UPS is expected to be installed 06/01.

**3. Hardware/Software limitations. (a) The Apollo software does not allow for adequate sound amplification on standard microphones. We had to acquire amplified microphones to properly transmit sound. Newer modifications of the software should correct this. (b) We need to be able to electronically sign our consults. Software update pending. (c) The printers are only able to print at 1/2 to 2/3rds size of the screen. A software update is pending. Training subspecialists on earlier, less user-friendly versions of the software was difficult. (d) The report function on the software was too limited in space and still is limited in printing (see 'c'). The report function has been upgraded. (e) Xray Scanner works well, but Twain interface works poorly (conversion from Apollo software), therefore must go right to scanner software. Saving the image is too slow (2 minutes) Solution in the software is still being worked out. (f) The Xray scanner had to be bought by the lead agent because there were non-available on GSA contract. There was not enough time by the end of the fiscal year to put it out to open bid. (g) The Teletethoscope was too expensive for the lead agent to buy, and there was no time to put in out for open bid. We can still accomplish a majority of the proposal without it. There needs to be a better way of buying off open bid for a research study with fiscal year budget constraints.**

**4. Process problems. (a) Practitioners are not completely filling out study reports. This is improving as the Apollo software is becoming more user friendly. (b) Printing, signing and scanning the consults is too time consuming for practitioner. A clerk or electronic signature should be used. (c) Information Management Division (IMD) support at DACH. The software and hardware are managed by CNSI, but IMD manages the servers and lines at DACH. The IMD has only recently agreed to support the research mission at all.**

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## Deliverables

Basic Telemedicine Unit (TMU) Pt exam kiosk 1. CPU (pent III; 128 meg memory; 933mHz processor) 2. Zydecron Interface board 3. a. 19" monitor b. 27" TV monitor\* for patient's to clearly see doctor 4. Peripherals a. Ophtalmoscope\* b. General Exam Camera\* c. Otoscope\* d. Scanner e. Printer f. X-ray Digitizer/Scanner\* g. Speaker h. Microphone (amplified) i. Software i. Internet ii. Apollo/CNSI computerized patient software iii. Windows 2000 iv. Statistics Software (Sigma Plot/Stat)\*\*

\*DACH Clinic only \*\*WHMC NICU only

**BAMC Clinic: 1 Telemedicine Unit (TMU). Installed 2/01, no functional problems.**

**WHMC: (a) 1 TMU Subspecialty Clinic. Lead agent, Region 6 replaced/supplied. Installed 02/01; functional 03/01; operational reliability 50% 03/01; operational reliability 75% 04/01; operational 90% 05/01 (b)1 TM unit in the NICU, Study supplied: installed 5/01; functional 5/01. First two studies 5/20, 5/28. Operational reliability (definition: Audio/software fixed; store & forward echo's as well as live; access to CHCS)projected 100% on or about 07/01/01. See problems about bandwidth problems from USAMISSA.**

**DACH: (a) 1 TMU at DACH Pediatric Outpatient Clinic, study supplied. Installed, operational reliability, functional to (See WHMC 'a' for dates and percentages) (b) 1 TMU at DACH Neonatal ICU, study supplied. Installed, operational reliability, functional to (See WHMC 'b' for dates and percentages)**

**Clinics started on 02/27/01. 130 clinic patients have been seen. 7 patients had two consults. 2 NICU inpatients have had echocardiograms. Pediatric Gastroenterology has seen 10 patients; Pediatric Endocrinology has seen 10 patients; Developmental Pediatrics has seen 3 patients; Pediatric Neurology has seen 106 patients. Data analysis is pending completion of original number of patients.**

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## Expenditures

	3Q FY 00	4Q FY 00	1Q FY 01	2Q FY 01	
Element of Resource (EOR)	Apr 1 - May 31	Jun 1 - Sep 30	Oct 1 - Dec 31	Jan 1 - Mar 31	TOTALS
Travel 2100	0.00	4,500.00	0.00	0.00	4,500.00
Shipping 2200	0.00	0.00	0.00	0.00	0.00
Rent & Communications 2200	0.00	0.00	0.00	0.00	0.00
Contract for Services 2500	0.00	108,500.00	0.00	27,498.00	135,998.00
Supplies 2600	0.00	0.00	0.00	0.00	0.00
Equipment 3100	0.00	174,000.00	0.00	0.00	174,000.00
<b>GRAND TOTALS</b>	<b>0.00</b>	<b>287,000.00</b>	<b>0.00</b>	<b>27,498.00</b>	<b>314,498.00</b>

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## Financials

The hardware and software acquisition for by study were as requested. An advanced RN was hired rather than an PNP for the project because of her experience and skills in research.

Full time Telemedicine registered nurse hired to supervise program at Darnell ACH. Cost represent startup for a complete subspecialty telemedicine program between one MEDDAC and one MEDCEN. Will also be connecting with 3 other MTFs within Region Six.

The lead agent had a simultaneous investment in telemedicine which accounts for some of the extra equipment that is noted under deliverables.

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## Final Results

Clinics started on 02/27/01. 130 clinic patients have been seen. 7 patients had two consults. 2 NICU inpatients have had echocardiograms. Pediatric Gastroenterology has seen 10 patients; Pediatric Endocrinology has seen 10 patients; Developmental Pediatrics has seen 3 patients; Pediatric Neurology has seen 106 patients. Data analysis based on the is pending completion of original number of patients and all the study questionnaires.

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## Projected Costs

**GS 10, step 0 Nurse at the Community Hospital: \$39,500 annual salary**

**Annual maintenance of Equipment and systems: \$21,000**

**Upgrading equipment every three years: \$3,000 annually**

**Maintaining DS 3 access. Cost unknown. Currently supplied to military posts through USAMISSA.**

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## Comments

**Many of the comments are already discussed under problems.**

**Many telemedicine items are not under GSA and the money comes late and leaves too soon for open-bid on some of the equipment.**

**USAMISSA supplied communication lines have not resulted in reliable transmission bandwidth.**

**All the software glitches make it very difficult for the naive user to want to use the systems.**

**There should be a larger component of the project funded and devoted to getting an operator training manual and a part-time trainer to educate the professional users.**

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## TATRC Scientific Review

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# TATRC Acquisition Review

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## Supporting Graphs/Charts

No Attachments