AD_____

Award Number: DAMD17-03-C-0058

TITLE: IMPGSS - International Medical Program Global Satellite System

PRINCIPAL INVESTIGATOR: Samuel S. Ciccio, M.D.

CONTRACTING ORGANIZATION: International Medical Programs, Incorporated
Albany, NY 12203-3726

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Fort Detrick, Maryland 21702-5012

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13. ABSTRACT (Maximum 200 Words)

The advantages and disadvantages of advanced medical education content delivery via different currently commercially available means such as satellite, internet subscriber digital network (ISDN) lines and the Internet are being examined in-depth. A viable and adaptable Transmission Configuration profile, with a range of associated utilization parameters and capabilities, will result as a basis for cost-efficient, value-added advanced medical education content dissemination. This Transmission Configuration profile will be highly relevant and adaptable to country content delivery strategies where a reasonably effective wide area network (WAN) is available. The range of offerings will encompass one-way through highly interactive expert/participant sessions with possibly segmented (segmented with different physical or electronic positioning of session moderators/managers/leaders) local/regional and international panel leaders.

Additionally, the use of different software, techniques, electronic educational tools, system integration approaches in combination with adaptation of evaluation/feedback input allowed by the recent evolution of available electronic education software, provides the basis for designing content delivery strategies that result in more effective knowledge transfer. The end result will lead to an enhanced ability to better leverage the knowledge transfer and exchange process.

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Table of Contents

INTRODUCTION

The subject and scope of the International Medical Program Global Satellite System (IMPGSS) research contract is to: examine, test, experiment and consider various transmission mediums that will result in the optimum transmission of advanced medical information content for physicians and other medical professionals in Poland with possible follow-on use by similar participants in adjacent Eastern European countries. The audience/participant base, and medical topics chosen, have been determined by the contractor, International Medical Programs, Inc. (IMP) in conjunction with leading Polish medical education professionals. Cost-effectiveness, availability of reception, network and in-country dissemination resources, infrastructure capability, assessment of immediate medical knowledge needs and optimal delivery possibilities, are key factors in audience and topic determinations. Of these considerations, the needed content, most cost-effective delivery system and the potential to quickly leverage the knowledge as delivered, are what drive topic selections – in combination with local professionals input. IMP has learned that content and delivery are two different phenomena but are intertwined for truly effective results. This research effort addressed exploration of transmission strategies per stated hypotheses. The emphasis on curriculum and medical education content formulation, combined with needs, was not reduced in scope.

BODY

The research accomplishments associated with each task as outlined in the Contract Proposal Statement of Work (SOW) are referenced below. Note: Pursuant to the Broad Agency Announcement, which governed this Proposal, a one page SOW was requested which addressed Research Objective, Scope and Tasks. To better facilitate the management of the Contract the Contractor, IMP, voluntarily appended to the requested one page SOW a more detailed version with numbered SOW tasks. Although not mandated, IMP has largely followed this more detailed SOW approach in management of the Contract.

This section of the Annual Report (Report), the Body, will address:

- the indicated SOW deliverables [by SOW numbered tasks as recited in the Proposal; e.g., "SOW 4.0 Scope"],

- then more generally the main numbered Hypotheses (there were three which were numbered in the Body of Proposal as "2.1" through "2.3"), and

- aspects of the Technical Objective, Body of Proposal "3.0" (this includes an update of what had been a representative diagram of a 'Possible Transmission Configuration' which is replaced by a more recently prepared management planning draft Transmission Architecture Configuration diagram for the upcoming March 2004 Test effort [note: this document is primarily a management document used as a Contract Deliverable; as such *it is a constantly changing representation* based on understandings, responsibilities and obligations between IMP as Contractor and its consultants, sub-contractors and third party service providers].

In the original Body of Proposal, IMP addressed 'Military Significance' and 'Methods' ("4.0" and "5.0", respectively). At the end of the first year, IMP does not believe either of these areas have changed or have been impacted significantly by research activity and therefore will not be addressed in this Report.

With reference to 'Methods' ("5.0"), IMP believes e a proprietary methodology may result, which includes a valuable "evaluation" component. IMP views this as an outcome of the research and so is described in a more summary fashion in this section ("Body"), Key Research Accomplishments and Reportable Outcomes. A summary level one-page synopsis of the emerging methodology will be contained as part of the Appendices.

SOW tasks:

4.0 Scope Deliverable A 000:

The general agreed upon audience/participant determinations have been established in the various IMP Assessment Team Trip Reports upon return from Poland. Certain specifics of audience/participant determination are being calibrated further in conjunction with the Polish medical education consultants IMP has retained in Poland (their collective services are vouchered under the 'ZiZ' management services arrangement). In particular, an upcoming 'test' transmission in March will determine specifics of the audience profile in conjunctions with preliminary transmission assessments, through an overall scoping level evaluation of both transmission mediums utilized and audience composition. This March 'test' effort is deemed to be a calibration exercise to focus the limited Contract resources on better uses and more focused assessment of transmission mediums and audience composition for subsequent program transmissions. Until this 'test' exercise is complete the specific audience/participant determination is subject to change from the input received. Furthermore, with each post-'test' program transmission, resulting evaluation input, may alter succeeding audience/participant determination. At the time of this report, the general Polish physician audience/participant profile objective targets both university and non-university physicians practicing general medicine and internal medicine and who are approximately ten (10) years post-medical school graduation.

The medical topics chosen are:

- acute coronary syndromes
- tuberculosis
- radiation safety & radiation injuries

5.2.3 Management Tasks

- Management Plan Deliverable A 001

This plan is contained in the combination of Trip Reports, ongoing Monthly Voucher Explanatory Notes, the recently held In-Process Review materials and the Contract Year 2 revised Detailed Cost Estimate for completion of the Contract. [Note: the revision to the Detailed Cost Estimate (DCE) is primarily a realignment of the Contract DCE amount originally established for the Proposal as revised, prior to Contract activities and it portrays the Contractor's best estimate of anticipated expenditures under the Contract for the remainder of the Contract. It is not a revision to the Contract but rather a clearer portrayal of where and how the

remaining budget is likely to be expended in appropriate DCE line items versus what was originally portrayed at the time of original Contract Proposal].

- Integrated Master Schedule Deliverable A 003

This sets forth the dates, topics, timeframes, initiating & receiving locales, transmission & network dissemination links, tentative experts involved, audience/participant moderators (if any) and e-tools usage use and to what degree and who moderates these if apart from receiving audience moderators. As such this management tool, as a deliverable, is in a state of flux up to to actual transmission times. This also includes calibration 'test' exercises. The most current version of this management tool is included in the Appendices.

- Monthly Invoice & Expense Rpt Deliverable A 009

This sets forth the monthly submission for cost reimbursement under the Contract. Any thing that is new, significant, needs approval, or needs contextual explanation, is contained in the Explanatory Notes that accompanies each Voucher submission. As such, the Voucher has provided a window of IMP's direction and actions apart from other reports, meetings, communications and deliverables under the Contract.

5.2.4 Project Reviews

- Monthly Status & Upcoming Activity Rpts Deliverable A 004
- In-Process Review "

Much of ongoing reporting, developments, decisions and direction for Contract activity occur in the Monthly Status & Upcoming Activity Reports. Note should be made that the detailed level SOW states 'Quarterly Status Reports' but IMP has switched to the referenced format at the request of TATRC. In addition, IMP presented and participated in its In-Process Review at the end of January 2004. Therefore, most of the still relevant PowerPoint slides from that presentation are included in the Appendices (the only slides not kept relate to: i) the summary level Detailed Cost Estimate revision for the remaining year of the Contract (CYr2) - the line item balances have changed slightly from what was conveyed at the time of the In-Process Review, ii) a more up-to-date Transmission Architecture Configuration graphic, and iii) some additional comments regarding the significance of working with Tachyon and NASK under this Contract).

5.2.5 Requirements

- Country/Region Assessments
  (Conference Minutes/Trip Reports) Deliverable A 005

Within days, the IMP Assessment Team, collectively and individually, files a set of Trip Reports following return from each visit to Poland. These Trip Reports contain much of the IMP Country/Region Assessments. Additional input is received from the ongoing activity of the Polish medical education consultants retained under the ZiZ management services arrangement. Their input is reflected in e-mails, phone calls and their individual monthly billing summary reports which are submitted monthly with each Voucher.

- Requirements Definition Document Deliverable A 006

As previously explained, this is a constantly changing document primarily exemplified by the graphic of the current anticipated Transmission Architecture Configuration. This graphic is included in the Appendices along with a one-page bullet point outline of other relevant, currently established program transmission parameters. It is repeated that in March 2004, IMP will conduct a 'test' program transmission which will be used to calibrate more formal program transmission efforts based on the input and evaluation of the 'test'. Also, because the function of 'evaluation' has been raised significantly based on research activity under the Contract, the results of each program transmission evaluation will sharpen and narrow the research activity of succeeding program transmissions.

5.2.6 Telecom Research/Working Survey Deliverable A 002
(this will eventually be part of Deliverable A 013)

This research is ongoing and can change quite dramatically from week-to-week due to technological advancements, commercial announcements re: pricing and availability of new capabilities and IMP's assessment of long term impact on what IMP has focused on under this research Contract. The Transmission Architecture Configuration graphic represents this research, in contemporary form, and its associated one-page bullet point outline of who the contemplated key vendor/third party service providers are envisioned to be, their roles and some relevant, currently established program transmission parameters. For example, the emergence of the significance of Tachyon's fit of services, capabilities and pricing in light of the needs apparent form IMP's preliminary research findings, is quite recent and was not as apparent at the time of the In-Process Review one month ago [note: it was not announced formally as a commercial service but IMP was introduced to these services on a tentative exploratory basis by Tachyon].

5.2.7 Program Development Deliverable A 007

This is currently summarized in the Program Content Curriculum & Presenters planning draft that is included in the Appendices. Due to research findings, there is an addition to the program content descriptions in terms of the planned utilization of DoD approved standard e-tool (Centra) for leveraging the education process and possibly adding a further channel for feedback and evaluation.

5.2.8 Knowledgebase & Database Deliverable A 008

As IMP proceeds through each of the planned transmissions sequences and research efforts it will become more narrowly focused, and this deliverable will take final shape. It will encompass the feedback, input and evaluation from each of the sessions and use of the collaborative e-tools by the audience/participants, their moderators and the panel experts. This material will also contain preliminary research findings of IMP.

5.2.9 Play-Out Capability/Facility none

Ongoing, internal memos and e-mails function as the basis for determining who and how among the various consultants, sub-contractors and third party service providers will handle transmission, broadcast control, server functioning, and recording/play-back capabilities. This

aspect is important for purposes of possible follow-on feedback and evaluation input. In documentation form, the results of these communications will appear in the Library Management deliverable mentioned below.

5.2.10 Scheduling Deliverable A 011

This information is part of the more comprehensive document that includes a Program Transmission Summary, which outlines the dates, approximate times and participation of experts and moderators, as well as audience/participant locales.

5.2.11 Library Management Deliverable A 012

This deliverable will be determined in the immediate run-up to the 'test' effort scheduled for March 2004. Likewise, this will also be added to during the run-up to subsequent program transmissions.

5.2.12 Finding & Final Report Deliverable A 013

Deferred to conclusion of Contract activity

5.2.13 Telecom Approach Deliverable A 000 & A 002

This deliverable information is contained in the management tool, as updated, identified as the Transmission Architecture Configuration, which is part of the Appendices.

2.0 Hypotheses Commentary [from Original Body of Proposal]:

2.1 First Research Issue & Expected Finding

Whether it is likely or possible to identify certain medical education approaches, technologies and dissemination mediums and strategies that significantly amplify and leverage medical treatment capabilities of targeted Polish/Eastern European physicians (and other health professionals)?

IMP believes this is the case and the preliminary stage of the research effort tends to bear this out. The overall point of the research effort is to examine this hypotheses and IMP is excited about the development of methodologies, including an adapted use of evaluation strategies in combination with emerging highly capable e-tools. These techniques may lead to faster and better cycling of feedback to rapidly adjust and improve curriculum emphasis and dissemination strategies. But the research effort is extremely early precluding statements of conclusions.

2.2 Second Research Issue & Expected Finding

What commercially available (or soon to be available) technologies could facilitate dissemination of advanced medical education content in countries with less developed infrastructure? What features of these technologies can be readily utilized with minimal

assets/resources/funding to leverage the effect of the medical information transmission or reception in less ideal environments?

Of the three research thrusts, these are is the most defined at this stage. First, dissemination technologies have grown so that the perceived benefits of 'spot-casting' have been reduced considering its high cost despite the flexibility and quality of its signal. IMP has identified some new transmission technologies with lower costs and highly flexible for uses envisioned in international medical education contexts. These are partially reflected in the most current draft Transmission Architecture Configuration graphic contained in the Appendices. They are highly flexible, highly capable, efficient and offer a fairly wide range of transmission and broadcast possibilities when paired with likewise efficient network service providers and program origination sources. IMP believes that while integration of the systems, technologies and capabilities are key, the required customization is not of such a high degree that prevents a wider use of the emerging menu of capabilities that might serve medical education needs. There may be some global geographic limitations due to footprint restrictions but that is not at issue in this research Contract. If IMP is successful in the utilization of these increasingly integrated technology capabilities, there maybe a proprietary dimension to IMP's research findings.

One clear trend is that the traditional high fixed cost and delivery strategy limitations of traditional telecom approaches 'hijacking/overwhelming' specific project needs, objective and flexibility is receding if not disappearing. This possibility of freeing content delivery from a high fixed cost straightjacket of traditional telecom delivery strategies frees content to be delivered under much more flexible and optimal dissemination means – including experiments with multi-media and multi-dimensional delivery and feedback (i.e., various '2-way' mediums; not just very expensive live interactive broadcast quality transmissions). IMP speculates whether this new flexibility might usher in a range of content delivery possibilities that could not be adequately imagined as recently as a few years ago.

2.3 Third Research Issue & Expected Finding

Explore how prepared programs and organized inter-active expert sessions can be effectively extended (the following is a new twist to the research hypothesis) – extending use of the program coverage more fully throughout a given country, as well as the earlier stated thesis of possible broader out-of-country regional use. Also consideration of what other communication technologies can enhance and effectively expand the footprint delivery of the program content.

This is another research thrust that presents opportunities to a more value-added use of program content. The growing sophistication of wide area networks and the capabilities of firms that can professionally handle the myriad of management tasks of international content dissemination in these networks could be instrumental in effective low-cot delivery strategies. IMP is discovering that at an attractive cost profile, program content can be wheeled more thoroughly within a country depending upon its network capabilities. This is an attractive adjunct to contemplating passive dissemination strategies to adjacent countries in the geographic region. Also, the combination and integration of a new generation of e-tools in the program curriculum structure, which more fully utilizes such wide area network capabilities, can more fully expand the educational experience and provide feedback loops for quicker and tighter

evaluation considerations. This can allow for much faster reaction times and content adjustments (e.g., 'on-the-fly' possibilities).

3.0 Technical Objective

In the Appendices, there is a more current update of what was Attachment A of the original Proposal as the evolving technical solution for Transmission Configuration graphic. This is illustrative of how the March 2004 'test' will be accomplished and in a generic functional way, by whom.

5.0 Methods

The methods employed by IMP as explained in the original Proposal have not changed. However, an area that IMP has enhanced in its program development and adaptation approach is the 'evaluation' component. The evaluation addresses technical transmission assessments and program content delivery and audience/participant comprehension – both of the expert materials and panel members (and moderators) and understanding of the curriculum conveyed and discussed. In conjunctions with other internal formulations by IMP and its consultants, the emergence of a more robust emphasis on evaluation is part of what IMP views as a possible proprietary methodology.

KEY RESEARCH ACCOMPLISHMENTS

- After a lengthy Request For Proposal/Request For Information (RFP/RFI) process, and extensive inter-party communications and successive iterations with potential vendors and service providers with an increasingly narrowed focus (which was not billed to IMP by any of the providers), IMP was able to formulate with their help a technical solution in the form of the current draft Transmission Architecture Configuration contained in this Report. Its innovations, cost-savings and effectiveness will be 'tested' in March 2004 for calibration and preliminary feedback purposes to make adjustments for the more comprehensive program transmissions to follow later in the year. The firms involved in collaborating with IMP, and their anticipated roles, to arrive at the current draft Transmission Architecture Configuration indicated in this Report are:

    - New York Network - satellite transmissions & providing equipment for dissemination; program content reformulation (update production of ACS program content)
    - Viking Productions of Hudson Valley Community College – video & internet streaming
    - NASK (Poland network services provider) – transmission reception, in-country dissemination services and equipment usage.

- Surveys, research, inquiries and analysis of telecom advances led IMP to conclude that program transmission research should increasingly focus on:

- Further integrated use of collaborative e-tools software in program dissemination structure (e.g., Centra)
- TCP/IP-based satellite transmissions and transmission pricing based on segmented, limited use data volumes via Tachyon.

- A more involved use of evaluation techniques has been identified as an intricate component of programming use and audience/participant feedback. Consultants experienced in distance education.

- Based on Trip Assessments and ongoing input from Polish medical education consultants, the following programs will be transmitted:

  - Acute Coronary Syndromes
  - Tuberculosis
  - Radiation Safety & Radiation Injuries

  The Acute Coronary Syndromes main program has been completed. The Tuberculosis script is in process. Other program curriculum module components, procedures as well as the structure and composition of the interactive/round table discussions are under planning, discussion and process.

REPORTABLE OUTCOMES

1. January 13, 2004 IMPGSS Contract In-Process Review Presentation [note: the actual IPR PowerPoint document is included in the Appendices except for a draft representative Contract Year 2 Detailed Cost Estimate (DCE) slide/page which is omitted as it is superseded by the DCE actual revisions that will be submitted following delivery of this Report]

2. TATRC International Day prior to 2004 Annual Meeting of the American Telemedicine Association Presentation entitled -

   An Architecture and Technology for Scalable Medical Content Delivery: International Medical Programs, Inc.'s Experiences from Poland

   - Abstract
   - Full PowerPoint Presentation

3. It is planned that IMP will generate research findings directed to the work of Contract Year 2 regarding technology integration for medical education content delivery, evaluation/feedback mechanisms, curriculum and program format adaptations to best utilize and adapt to transmission mediums and delivery strategies. As of the end of Contract Year 1 work directed to this research and possible findings was still in process and emerging.

CONCLUSIONS

The advantages and disadvantages of advanced medical education content delivery via different currently commercially available means such as satellite, internet subscriber digital network (ISDN) lines and the Internet are being examined in-depth. A viable and adaptable Transmission Architecture Configuration profile, with a range of associated utilization parameters and capabilities, will result as a basis for cost-efficient, value-added advanced medical education content dissemination. This Transmission Architecture Configuration profile will be highly relevant and adaptable to country content delivery strategies where a reasonably effective wide area network (WAN) is available. The range of offerings will encompass one-way through highly interactive expert/participant sessions with possibly segmented (segmented with different physical or electronic positioning of session moderators/managers/leaders) locally or regionally and international panel leaders.

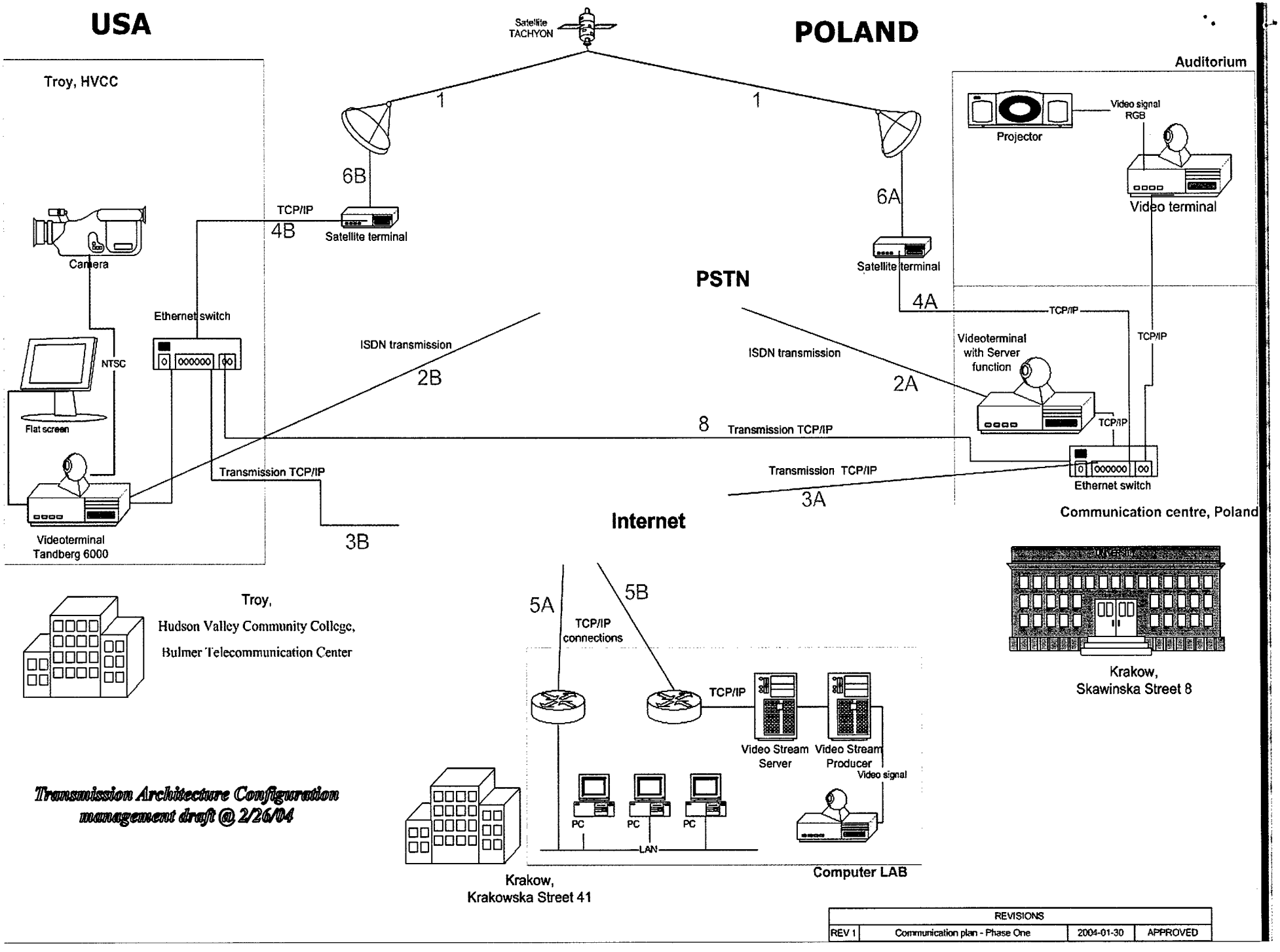
Additionally, the use of different software, techniques, electronic educational tools, system integration approaches in combination with adaptation of evaluation/feedback input allowed by the recent evolution of available electronic education software, provides the basis for designing content delivery strategies that result in more effective knowledge transfer. The end result will lead to an enhanced ability to better leverage the knowledge transfer and exchange process.

APPENDICES

APPENDIX A

Transmission Architecture Configuration

(management draft 2/26/04)



REVISIONS			
REV 1	Communication plan - Phase One	2004-01-30	APPROVED

INTERNATIONAL MEDICAL PROGRAMS

Transmission Architecture Configuration
Management Draft @ 2/26/04

IMPGSS Vendors & Their Roles for the Project

- **New York Network, Albany, New York : This vendor is primarily used in the capacity of Broadcast Satellite telecommunications, as well as for the development of the Medical Programming/non-linear video editing.**

- **Hudson Valley Community College (Viking Video Technologies) Troy, New York: This vendor is primarily used in the capacity of ISDN & Internet video streaming technologies, as well as their television studio facilities.**

- **Centra Software, Lexington Mass. : They are a provider of application software and services for real-time enterprise collaboration (RTEC). They will be our Internet platform provider.**

- **IP Logic, Albany New York : This vendor will be providing network analysis information services.**

- **Tachyon, San Diego, California : A provider of broadband satellite infrastructure and services to augment and extend terrestrial enterprise networks. They will be our vendor to collaborate with HVCC & NASK.**

- **NASK, Warsaw Poland: This is our "IP " provider in Poland. They will assist in the receiving and dissemination of all signals generated from the US.**

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APPENDIX B

Program Content Curriculum & Presenters

(planning draft @ February 2004)

IMPGSS Program Content Curriculum & Presenters

Planning Draft @ February 2004

CARDIOLOGY MODULES

Module #1: Core Curriculum Module – Acute Coronary Syndromes
Unstable Angina
Myocardial Infarction

Presenter: David Putnam, M.D.
Clinical Assistant Professor of Medicine/Division of Cardiology
Albany Medical College
Albany, New York

Module #2: Acute Coronary Syndromes – Risk Factors & Prevention Module

Presenter: Mark Nelson, M.D.
Assistant Professor of Medicine
Albany Medical College
Albany, New York

Module #3: Procedures and Applications Module

Topic #1: Automatic Implantable Cardio Defibrillator Implantation

Presenter: James P. O'Brien, M.D.
Clinical Instructor of Surgery
Albany Medical College
Albany, New York

Topic #2: Percutaneous Rotational Atherectomy & Stent Implantation

Presenter: Augustin DeLago, M.D.
Associate Professor of Medicine/Division of Cardiology
Director, Cardiac Cath Labs and Interventional Cardiology
Albany Medical Center
Albany, New York

Topic #3: **Transesophageal Echocardiogram**

Presenter: Robert Benton, M.D.
Assistant Professor of Medicine/Division of Cardiology
Director of Research, The Heart Institute
Albany Medical Center
Albany, New York

Module #4: **Cardiology Expert Panel Discussion Module**

Presenters: Open – Initial Presenter candidates from prior IMP efforts are:

Thomas Killip, M.D., Moderator
Director, The Heart Institute
Beth Israel Medical Center
New York, New York

Steven Horowitz, M.D.
Chief, Medical Cardiology
Beth Israel Medical Center
New York, New York

Michael Lesch, M.D.
St. Luke's Roosevelt Hospital
New York, New York

TUBERCULOSIS MODULES

Module #1: **Core Curriculum Module and Medical Decision Making**

Presenter: Raymond Smith, M.D.
Associate Professor of Medicine – Albany Medical College
Lead Physician, Infectious Disease
Stratton VA Medical Center
Albany, NY

Module #2: **Procedures and Applications Module**

Presenters: Max Salfinger, M.D.
Director, Mycobacteriology Laboratory
Wadsworth Center, New York State Department of Health
New York State Department of Health
Albany, NY

Harry Taber, Ph.D.
Director, Division of Infectious Diseases
Wadsworth Center, New York State Department of Health
Albany, NY

Linda Parsons, Ph.D.
Assistant Director, Mycobacteriology Laboratory
Wadsworth Center, New York State Department of Health
Albany, NY

Jacqueline Hotaling
Research Scientist
Mycobacteriology Laboratory
Wadsworth Center, New York State Department of Health
Albany, NY

Module #3: Tuberculosis Expert Panel Discussion Module

Presenters: Open – Initial candidates from prior IMP efforts are:

Neil Schluger, M.D., Moderator (Expert Panel)
Chief, Clinical Pulmonary Medicine and Public Health
Associate Professor of Medicine
Columbia University
New York, New York

Raymond P. Smith, M.D.
(See above title and affiliations)

Lisa V. Adams, M.D.
Director of Surveillance, Tuberculosis Control Program
New York City Department of Health
New York, NY

Naomi E. Aronson, M.D.
Associate Professor, Department of Medicine
Director, Division of Infectious Diseases
Uniformed Services University of Health Sciences
Bethesda, Maryland

RADIATION SAFETY AND RADIATION INJURY MODULES

Module #1: Core Curriculum Module – Radiation Safety and Radiation Injury

Presenter: Ronald Roth, M.D.
Associate Professor of Clinical Emergency Medicine
Chief of the EMS Division
Department of Emergency Medicine
University of Pittsburgh School of Medicine
Pittsburgh, Pennsylvania

Module #2: Procedures and Applications Module

Presenter: Gilbert H. Cosnett
Gilbert H. Cosnett & Associates
Nuclear, Biological, Chemical Medical Preparedness
Haddonfield, New Jersey
City of Albany Fire Department

Oswego Hospital
(IMP videotaped footage of a routine radiation decontamination drill, which took place at Oswego Hospital's Emergency Department for educational purposes)

Module #3: Radiation Safety and Radiation Injury Expert Panel Discussion Module

Presenters: Open – Initial candidates from prior IMP efforts are:

Colonel Robert R. Eng, Ph.D., (Moderator, Expert Panel)
Nuclear Medical Science Officer
Director, Armed Forces Radiobiology Research Institute
Bethesda, Maryland

Ronald E. Goans, Ph.D., M.D.
Section Leader, Medical Services, Radiation Emergency Assistance Center and Training Site (REACT/TS)
Oakridge Associated Universities
Oak Ridge, Tennessee

Erwin F. Hirsch, M.D.
Professor of Surgery, Boston University School of Medicine
Director, Trauma Center, Boston Medical Center
Boston, Massachusetts

Gilbert H. Cosnett
(See above title & affiliations)

Ronald Roth, M.D.
(See above title & affiliations)

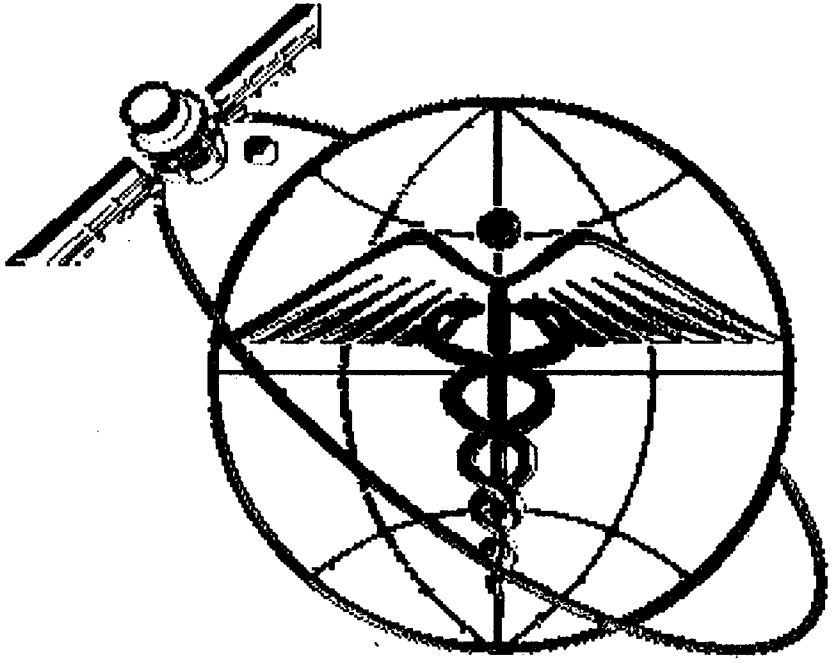
Niel Wald, M.D.
Professor or Radiology
University of Pittsburgh
Graduate School of Public Health
Department of Environmental and Occupational Health
Pittsburgh, Pennsylvania

APPENDIX C

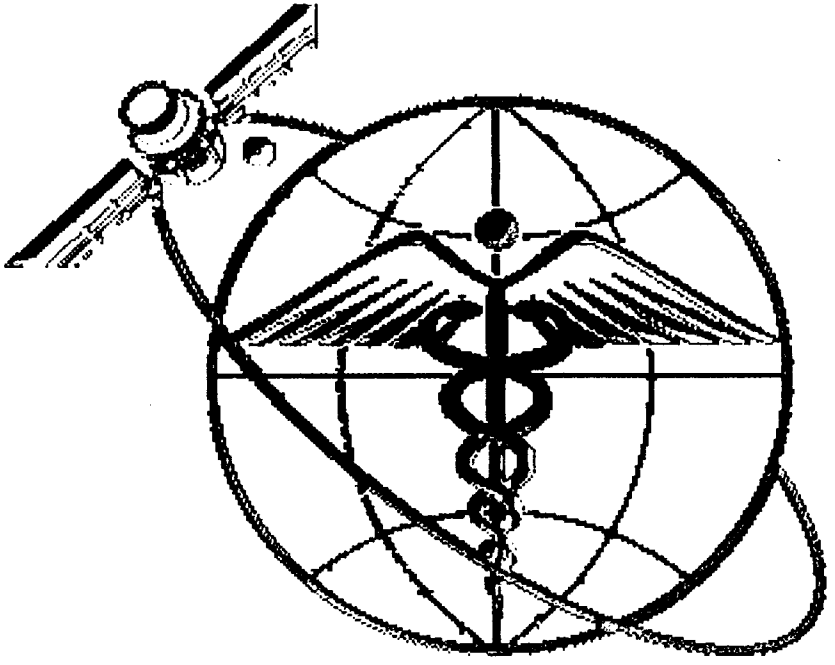
Powerpoint Printout of January 13, 2004 IMPGSS Contract In-Process Review Presentation

In-Process Review Presentation January 13, 2004

International Medical Programs



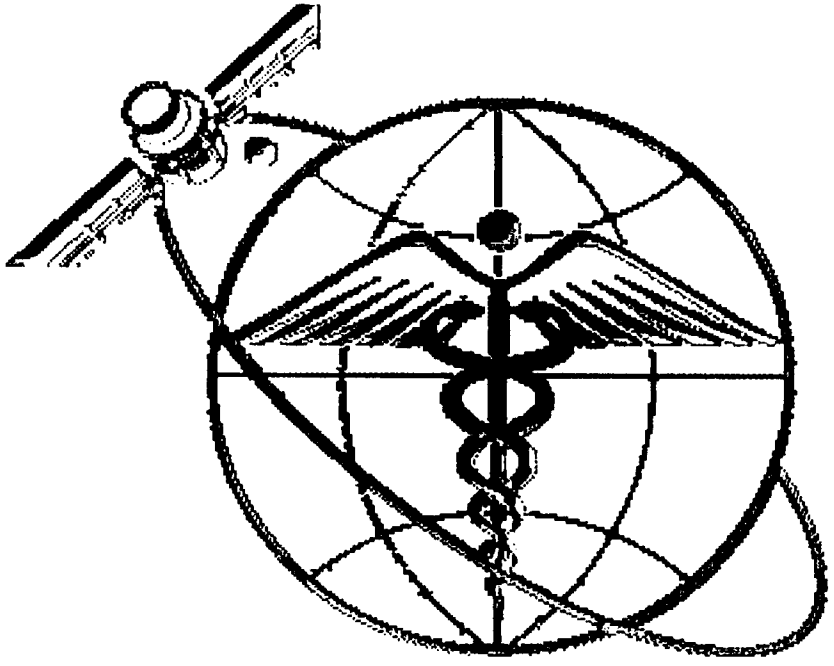
International Medical Programs



Request for Proposal
Request for Information

Chris Lenaghan
Production Manager

International Medical Programs



Execution of the Programs in Poland: Current Status

Prof. Boleslaw Szymanski, consultant

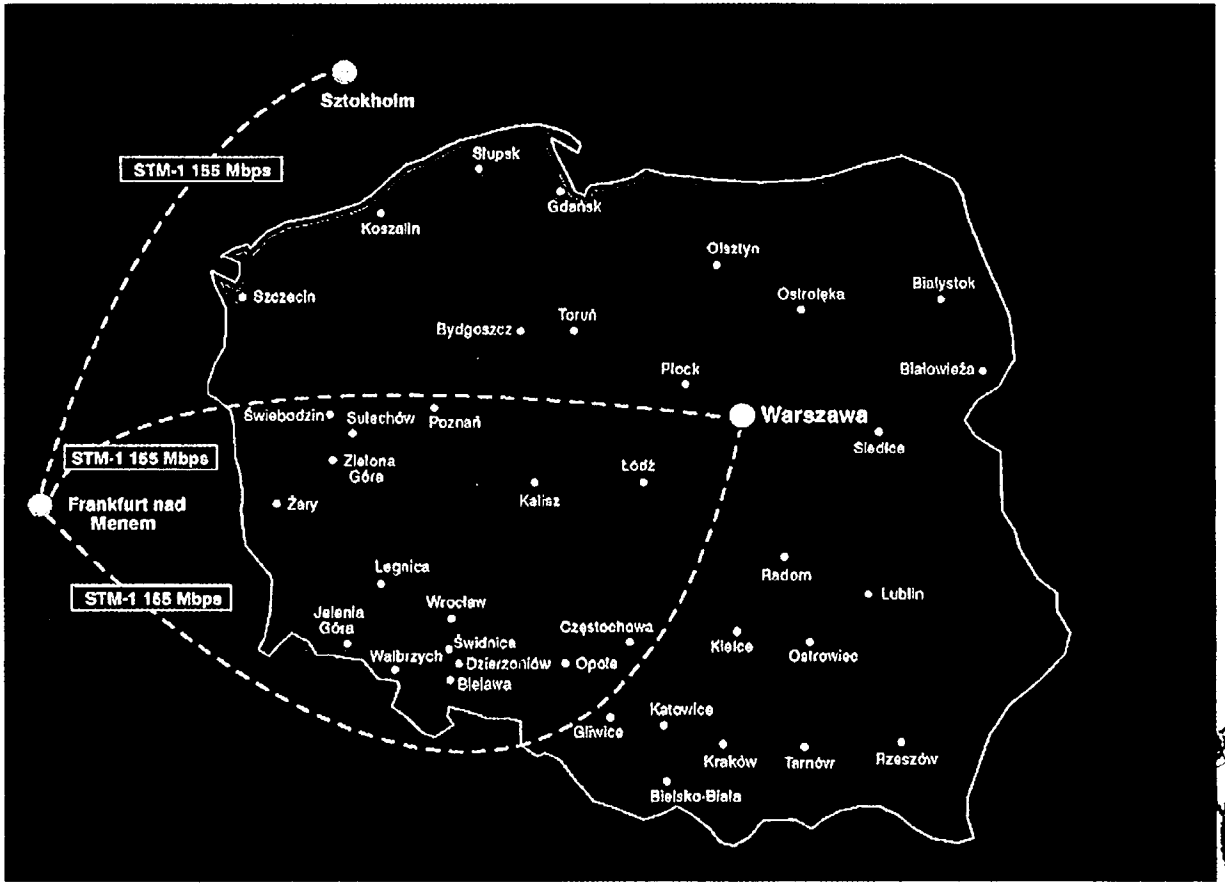
Competition for IMP Contract in Poland

- NASK: National Scientific and Commercial Internet Provider
- MP (Medical Practice) with Polish Telecommunication
- MOST (Mobile Open Society Through Wireless Telecommunication) with Telenegria

Main differentiating factor:

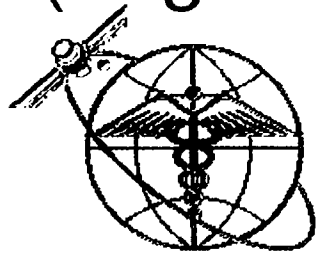
satellite cost

NASK Network



NASK Advantages

- Experience in synchronous broadcast (the first Internet based virtual concert in 2001)
- Large research activities (NASK is partially private, partially government funded to coordinate and conduct Internet based research for academic institutions in Poland)
- Strong position with subcontractors (large volume of subcontracts)



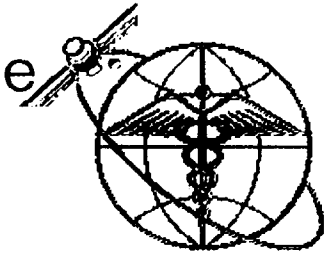
Division of Responsibilities in Poland

IMP Krakow office:

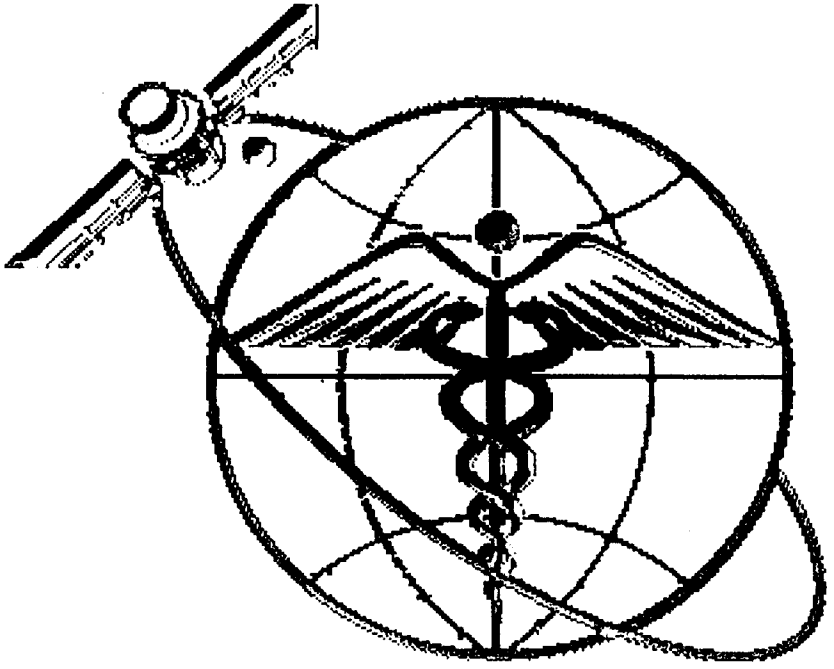
- Customization of the medical Programs to locals needs
- Programs promotion, including selecting audience and securing Programs evaluation
- Providing translators, Programs moderators and auditoria

NASK:

- Transmission of Programs from the satellite/ISDN link and/or Internet to the auditoria
- Providing video and audio equipment for the auditoria
- Design and execution of the Programs transmission in all technical aspects



International Medical Programs



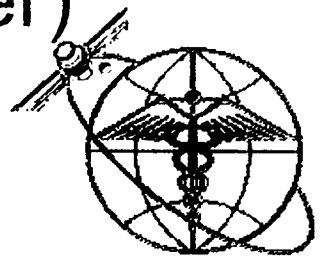
Vendors for Implementation

Chris Lenaghan

Production Manager

Vendors

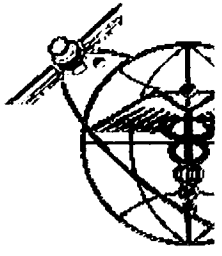
- *New York Network*
  (Satellite and Production Providers)
- *Hudson Valley Community College*
  (T-1, ISDN, Internet Gateway Providers)
- *Centra* (Internet Platform Provider)
- *IP Logic* (Network Analysis Provider)



Centra

Internet platform designed to *synchronousl* (real time) deliver education to distance, distributed clients via:

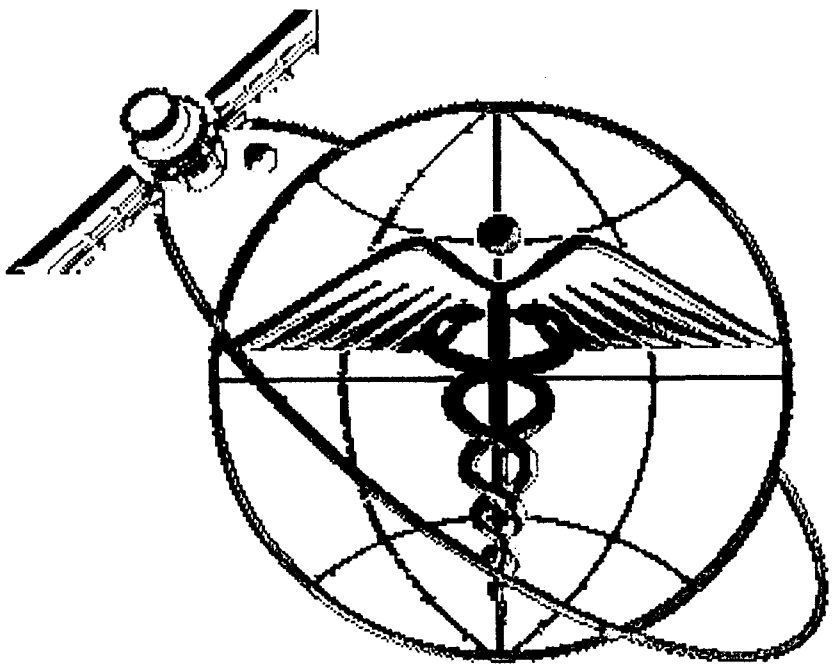
- **Duplex (two way) audio and text chat**
- **Graphic images**
- **Streamed video / Multimedia**
- **Recently rated as DOD software standards compliant, only software of its class to gain this rating**



Centra

- Advantages:
  - **Low cost of transmission / internet delivery**
  - **Collaborative, real time communication between doctors**
  - **Centrally distributed from server, minimal local hardware and software needs**
  - **Available at low bandwidth / telephone line**
  - **Graphic / audio / text channels**

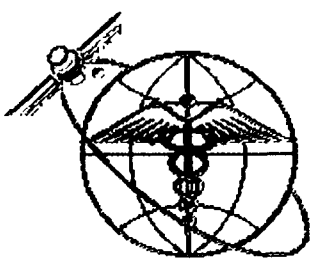
International Medical Programs



Review of organizational Structure in U.S.

Chris Lenaghan

Production Manager



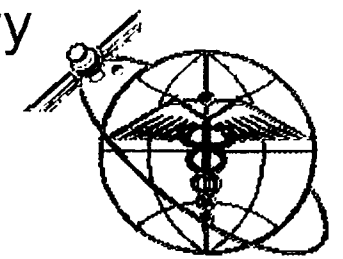
Vendors and Consultants

Vendors:

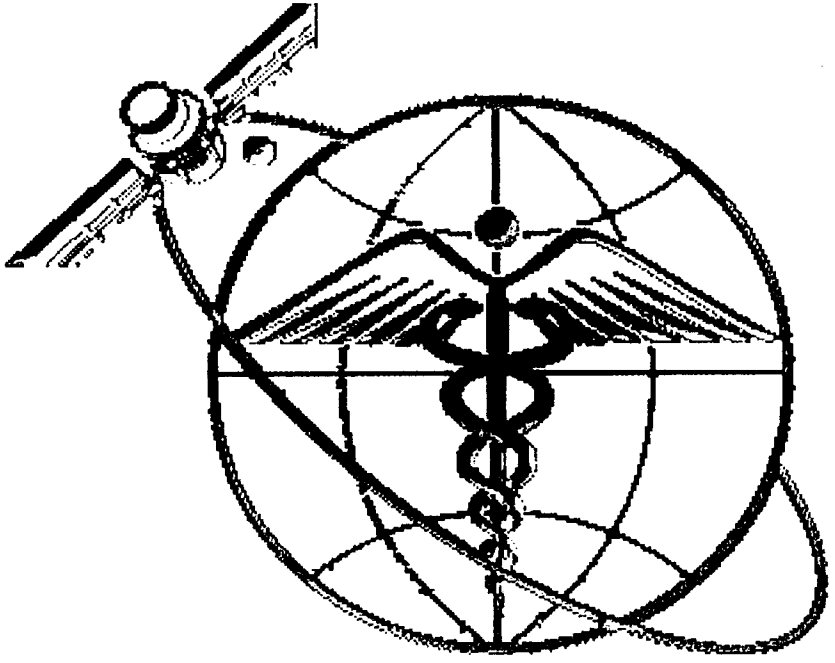
- NYNET
- HVCC
- IP Logic
- Centra

Consultants:

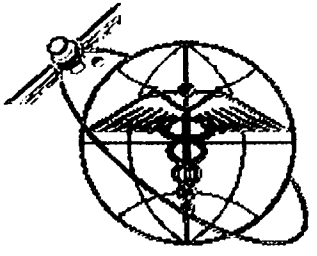
- John Hughes
- Professor Bolek Szymanski
- Susan Bray
- Dr. Putnam
- Dr.Smith
- Dr.Nelson
- Dr.Delago
- Dr.Benton
- Dr.O'Brien
- Wadsworth Laboratory
- Dr.Salfinger



International Medical Programs



Development of Medical Content/Programs Curriculum



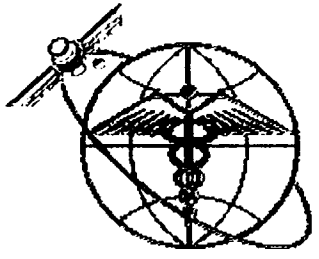
Dr. Sam Ciccio

Proposal Objective

IMP to develop medical education for Poland

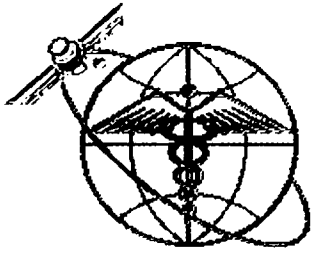
Results to Date

A series of mutually agreed upon professional level medical education Programs have been developed and are being developed for transmission to the Polish medical community.



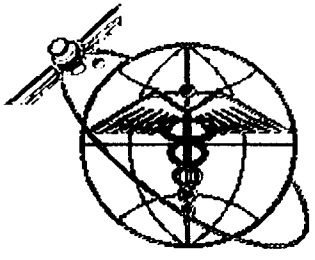
Programs Topics

- Acute Coronary Syndrome
- Acute Coronary Procedures
- Tuberculosis
- Radiation Safety / Injuries



Programs Curriculum

- Each Programs chapter is developed in a video chapter format



Programs Curriculum

Acute Coronary Syndromes
" Unstable Angina, Myocardial Infarction "
(7 video chapters)

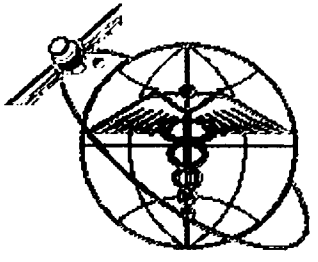
- **Chapter 1: Introduction, Epidemiology, Pathophysiological Changes (TRT 10:02)**
- **Chapter 2: Initial Evaluation & Assessment of the Patient (TRT 12:00)**
- **Chapter 3: Treatment Options (TRT 13:53)**
- **Chapter 4: Non-Invasive Testing (TRT 4:21)**
- **Chapter 5: Treatment of Acute Q Wave Myocardial Infarction (TRT 4:11)**
- **Chapter 6: Adjunctive Drug Therapy (TRT 17:50)**
- **Chapter 7: Risk Factors & Prevention (TRT 21:13)**

Programs Curriculum

Acute Coronary Procedures

(3 video chapters)

- **Chapter 1: Automatic Implantable Cardio Defibrillator Implantation (TRT 62:00)**
- **Chapter 2: Percutaneous Rotational Atherectomy & Stent Implantation *(2 procedures)* (TRT 28:00)**
- **Chapter 3: Transesophagael Echocardiogram (TRT 24:00)**



Programs Curriculum

Tuberculosis

(4 video chapters)

- Chapter 1: Introduction & Epidemiology
- Chapter 2: Pathogenesis
- Chapter 3: Clinical Aspects
- Chapter 4: Procedures

Programs Curriculum

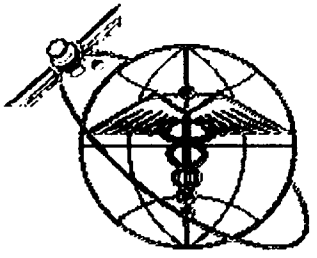
Radiation Safety
(10 video chapters)

- Chapter 1: Basic Radiation Physics
- Chapter 2: Radiation Injuries
- Chapter 3: Radiation Exposure
- Chapter 4: Acute Radiation Sickness
- Chapter 5: Overview Treatment
- Chapter 6: Surveying Equipment
- Chapter 7: Treating Patients
- Chapter 8: Patient Disposition
- Chapter 9:Emergency Department Procedures
- Chapter 10: Pre Hospital Radiation Procedures

Topic: Acute Coronary Syndromes/Acute Coronary Procedures

Production Schedule:

- Pre-Production
- Field Production
- Post Production
- Fulfillment



Pre-Production Phase

- April - Informed of topics following IMP April visit to Poland
- May - Contacted Content expert to ascertain his availability to assist in Programs production
- June - Content expert prepared initial draft of Programs content and was reviewed internally
- July - Script development – including storyboard / video elements and graphic treatment identified.
  Reviewed with Content expert.
  Determine need for field production

Production Phase

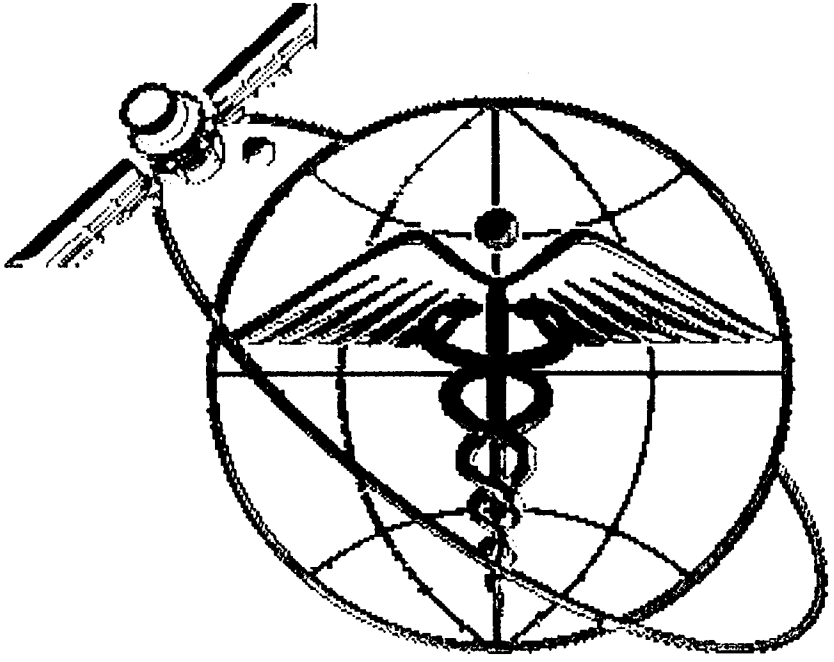
Field Production

- August- Acquired necessary images to support Programs content. Field production crew on location to film technical aspects of Programs

Post Production

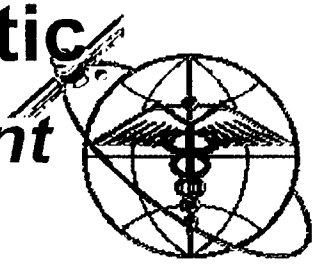
- September - Continued graphic development and insertion of images, animations and power point portions to be added to final production
- October - Began offline editing. Acquired talent requirements such as moderators, voice over expert and other personnel
- November - On line editing: final editing of all field production video components, graphics, voice over, animations and PowerPoint components
- December - Final review of Programs development and Programs continuity for completion of Programs. Programs completed.

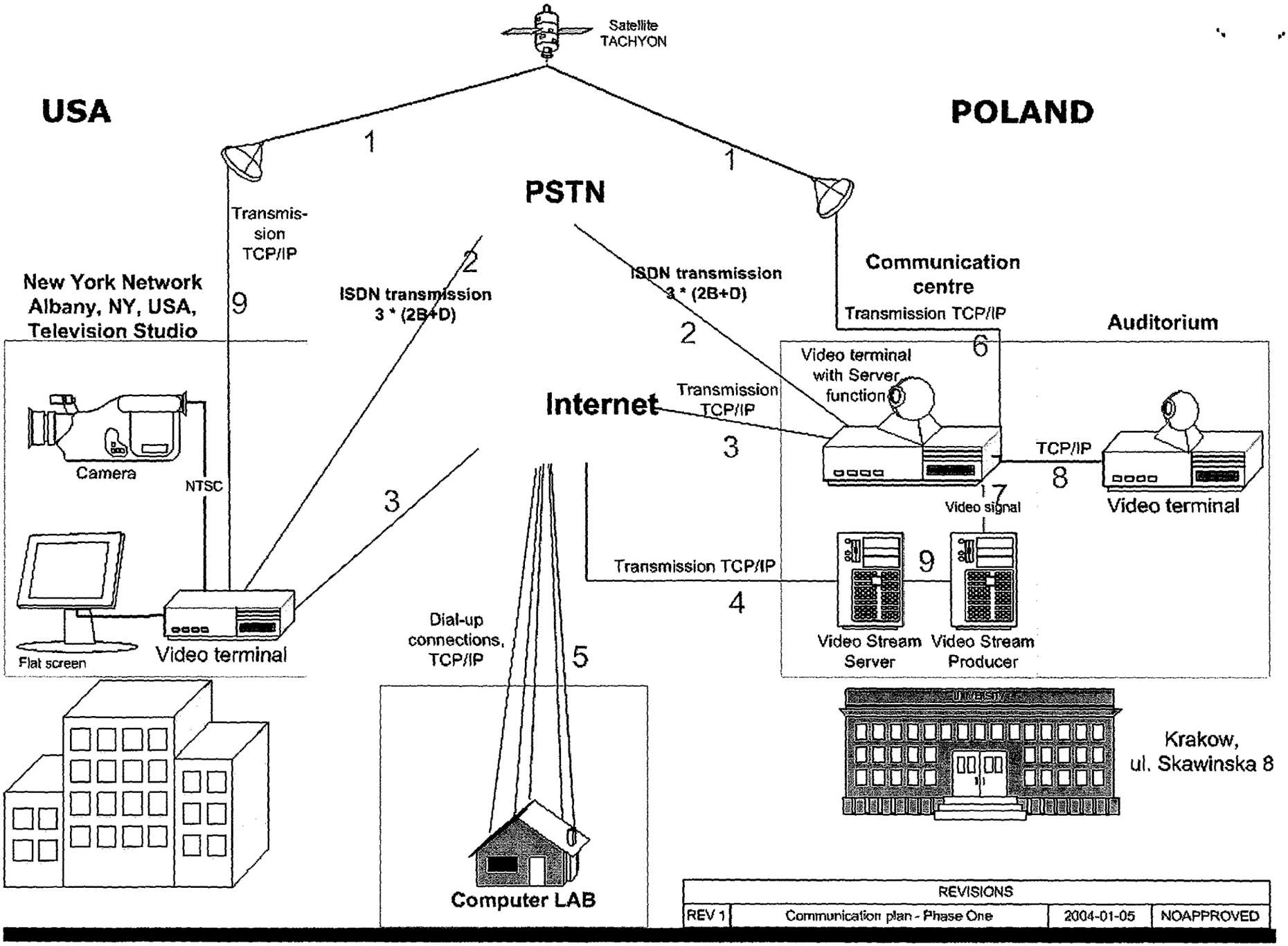
International Medical Programs



Proposed Transmission Schematic

Prof. Boleslaw Szymanski, consultant




Satellite
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ISDN transmission
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ISDN transmission
3 * (2B+D)
2
Communication
centre
Transmission TCP/IP
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Auditorium
New York Network
Albany, NY, USA,
Television Studio
Video terminal
with Server
function
Internet
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TCP/IP
8
Video terminal
Camera
NTSC
3
7
Video signal
Transmission TCP/IP
4
9
Video Stream
Server
Video Stream
Producer
Flat screen
Video terminal
Dial-up
connections,
TCP/IP
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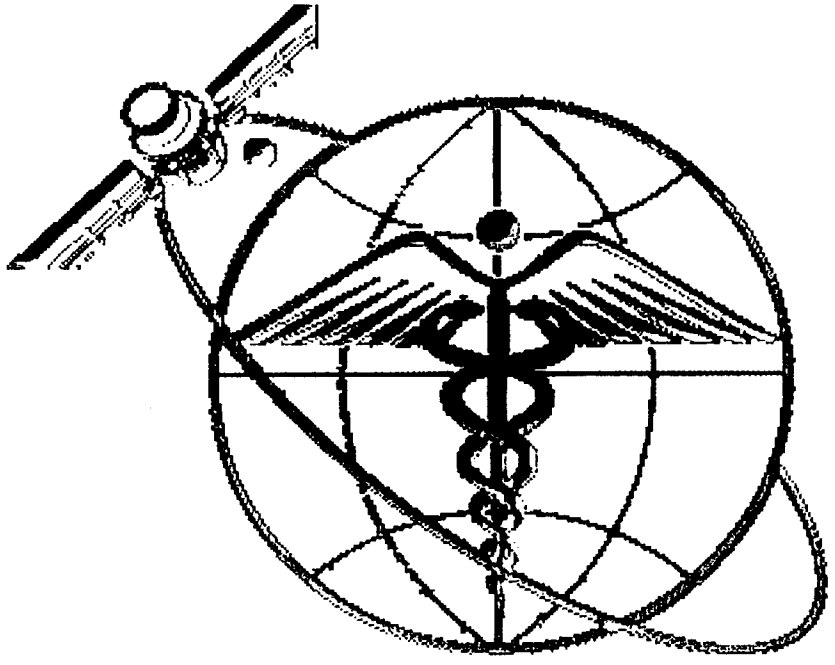
Computer LAB
Krakow,
ul. Skawinska 8
REVISIONS
REV 1
Communication plan - Phase One
2004-01-05
NOAPPROVED

International Medical Programs



Evaluation Methodologies

Dr. Sam Ciccio

Evaluation

- Working with Susan Bray, Associate Dean for Strategy and Development in Rensselaer Polytechnic Institutes distance education Programs
- Development of a model for distance delivery of medical content
- Evaluate technology and delivery model

Evaluation Plans -- Phase 1

Phase One (Viability Testing of Technologies)

Issues to be addressed:

- Were the 3 technologies successfully used separately?
- Was there a marked difference in satisfaction?
- Were we able to successfully combine the 3 technologies in singular transmission event?

Methods:

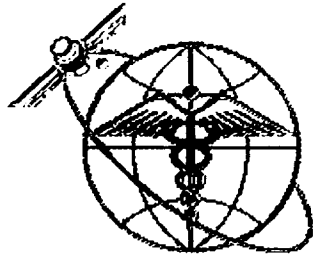
- Online questionnaires are being developed
- Focus Groups will evaluate transmission modes
- Formal Observation of Implementation Teams – via email and video testimonials

Evaluation Plans -- Remaining Phases

Research Assertions to be Assessed:

1. "That we can deliver peer-to-peer medical education simultaneously in multiple delivery formats (satellite, videoconferencing and Internet) using the IMP model and have positive learning, satisfaction and technical viability outcomes for all three formats."

2. "That certain types of instructional strategies will lend themselves better to certain technology formats."



Evaluation Plans -- Remaining Phases

Delivery Issues be Assessed:

1. Technical Evaluation
   - Quality of audio, video and graphical displays

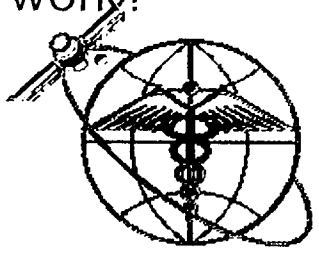
2. Quality of the Interaction
   - Moderated Discussions (Day One)
   - Round Table Discussions (Day Two)
   - The "Discussion Board" A "Discussion Forum" (On-line Bulletin Board) that has been used during the events, will continue for one month

Evaluation Plans -- Remaining Phases

Learning Content Issues to be Assessed:

1. Quality of the Learning Materials
   - Advance Information
   - Video Materials (Production Values and Instructional Design)
   - Design of the Event

2. Impact of the Educational Experience
   - Were the learning objectives met?
   - Is this content valuable to you?
   - Will exposure to this content impact professional work?
   - Suggestions for Future Topics



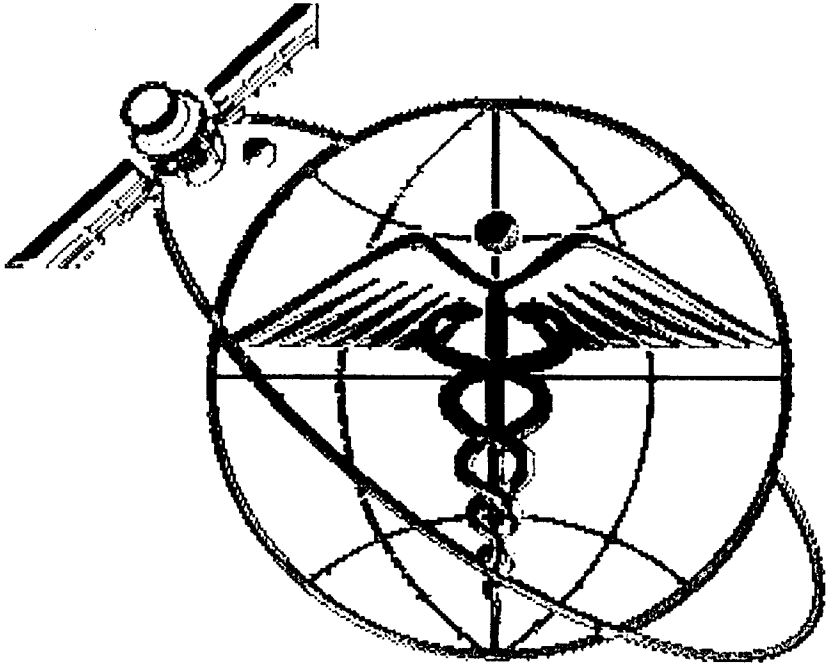
Evaluation Plans -- Remaining Phases

Proposed Evaluation Approaches (Phase 2+):*

- Online questionnaires
- Focus Groups
- Formal Observation of Implementation Teams
- Analysis of "Discussion Board"
- Video Testimonials of participants

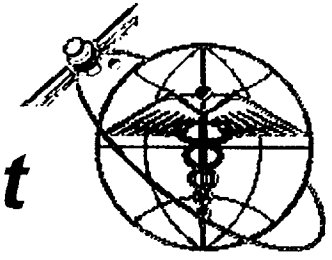
*Note: The model and approaches will be modified in each successive phase based on feedback

International Medical Programs



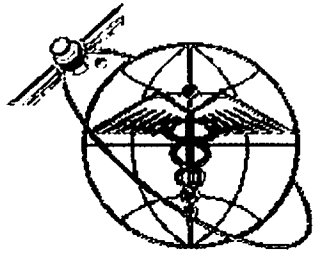
IMPGSS Contract Budget

Charles Cernansky, Consultant



IMPGSS Contract Budget

Per Contract Year 1	**$849, 723**
less Vouchers Paid	
through November 30	**(538, 603)**
	311,121
December Voucher	**(59, 292)**
	251,829
projected Jan. '04 Voucher	**(52,000)**
Remaining Budget at Contract Yr 1 End	**199,829**
Per Contract Year 2	**835,726**
Remaining Contract Budget	**$1,035,555**



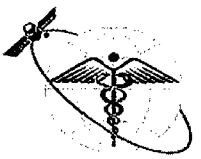
APPENDIX D

TATRC International Day/2003 Annual Meeting of American Telemedicine Association

An Architecture and Technology for Scalable Medical Content Delivery: International Medical Programs, Inc.'s Experiences from Poland

- Abstract

- Full Powerpoint Printout of Entitled Presentation



INTERNATIONAL MEDICAL PROGRAMS

An Architecture and Technology for Scalable Medical Content Delivery: International Medical Programs Experiences in Poland

A.P. Tartaglia, D.L. Weiner, S.S. Ciccio, B.K. Szymanski, C.M. Lenaghan, C.J. Cernansky and J.F. Hughes

Medical content delivery for international medical education poses unique pedagogical and technological challenges when compared to generic distance education. International Medical Programs (IMP) focuses on delivering high quality continued medical education to technologically underdeveloped regions.

The presentation starts with a description of IMP mission and structure and a summary of IMP's past involvement in the Republic of Georgia. Then, advantages and disadvantages of medical content delivery via satellite, ISDN lines and the Internet are discussed. An integrated architecture is proposed for highly reliable delivery through connection redundancy. Scalability of the program is discussed and the use of a two-tier structure using the publicly available Wide Area Network (WAN) in the target country is proposed.

The second part of the talk characterizes medical and technological environments in Poland and describes their impact on the proposed medical content of the program and the methods of its delivery. The talk concludes with a discussion of opportunities for extending this program to other countries in Eastern Europe.

6 Executive Park Drive, Albany, New York 12203
Phone: 518-438-0272 ● FAX: 518-438-0414 ● E-mail: clenaghan@IMProg.com

An Architecture and Technology for Scalable Medical Content Delivery: International Medical Programs Experiences in Poland

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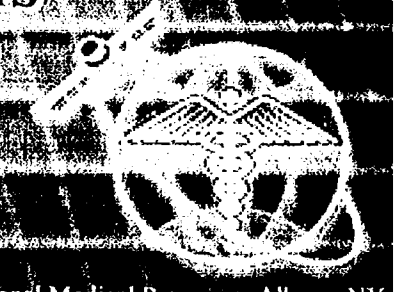
International Medical Programs

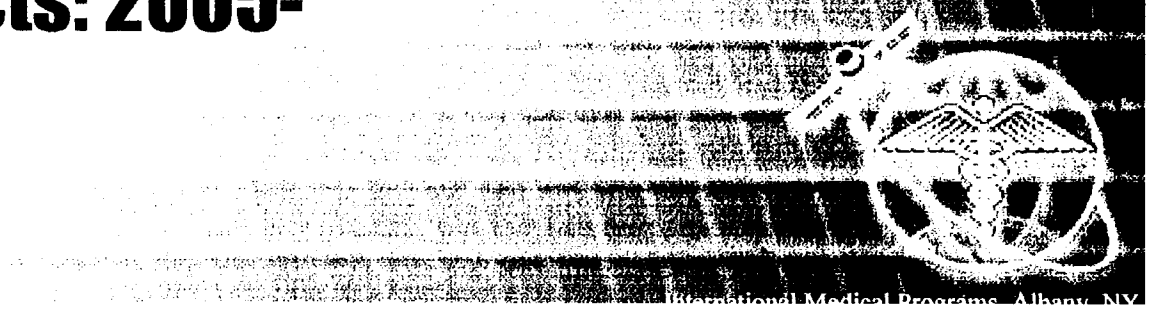


Outline

- IMP organization and structure
- Goals and Challenges of Remote Medical Education
- Possible Technical Solutions
- IMP Program Delivery Architecture
- Scalability of Educational Interactions
- Specific Challenges in Poland
- Conclusions

International Medical Programs

- IMP: founded in 1999
- Program in Republic of Georgia: 2000-2001
- Program in Poland: 2003-2005
- Future Projects: 2005-



Goals of Current Project in Poland

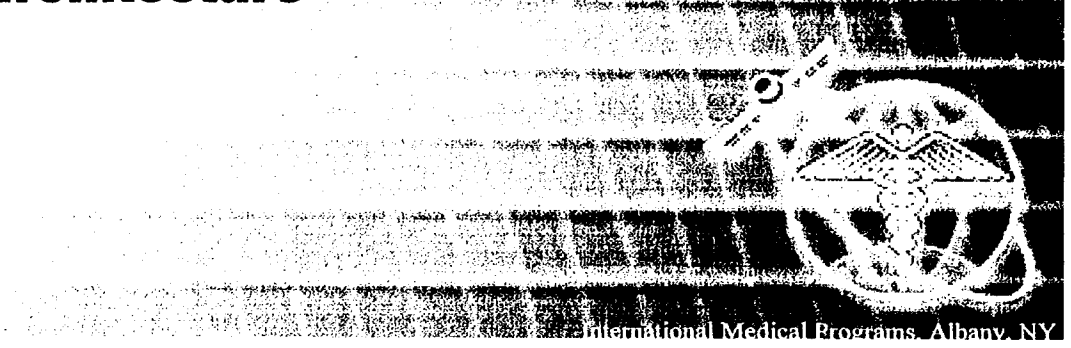
- **Providing continuing medical education in Poland that:**
  - -- is delivered in units, each consisting of three components:
    - (i) basic knowledge and procedures
    - (ii) diagnosis/treatment
    - (iii) newest developments discussed by a panel of experts
  - -- enables interactions with experts and authors of the programs in US
  - -- focuses on regional or national needs
- **Establishing the best mixture of transmission technologies**

  to optimize economical efficiency (cost per participant)
- **Measuring scalability**

  ability to reach the largest possible audience while preserving interactions of audiences with experts

Challenges of Medical Content Delivery:

- Interactions set a tight limit on acceptable delays
- Quality of visual image required for medical community (diagnosis, treatment, procedure) sets tough requirements on the needed bandwidth
- Ability to reach remote regions of the world requires long range communication
- Non-interactive parts of the program require inclusion of a low cost component in the architecture



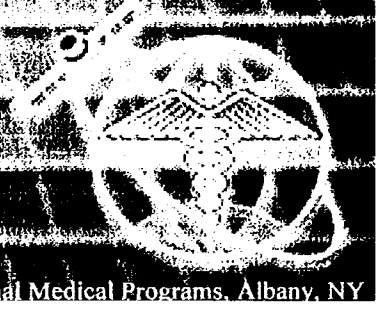
Wide Area Network Connectivity

Transmissions from/to US and Poland require Wide Area Network connectivity, either dedicated (satellite, ISDN) or shared (public Internet, overlays)

Satellite transmission uses leased bandwidth of a commercial satellite and antennas and satellite terminals to up- and down-load the signal.

Benefits of the satellite transmissions include:

- **-- large bandwidth**
- **-- constant delay of the transmission signal**
- **-- scalability of transmission**
  - **large geographical area can be simultaneously covered by one transmission**



Satellite Based Transmission Disadvantages:

- High cost of purchasing broadcasting time

  An approach using IP and sending transmissions in packets alleviates this issue

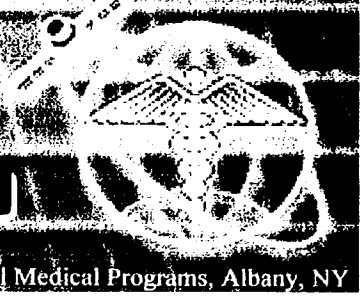
- High cost of transmission time
- High cost of the antenna and satellite terminal

  Expected massive deployment by MCI of Tachyon satellite network may alleviate this issue

- Basically asymmetric channel

  Dual communication often raises the price significantly, especially transmitting (questions, interactions) to US

- Unreliable (can be disrupted by extreme weather conditions)



ISDN Transmission Considerations

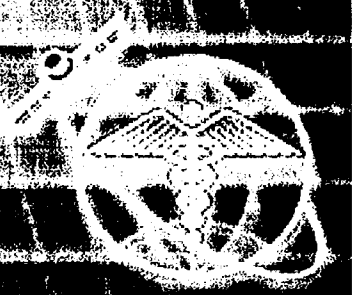
ISDN leased line is an alternative Wide Area Network technology suitable for our programs

- **Advantages:**
  - **Reliability (weather independent)**
  - **Guaranteed bandwidth, although often lower (but less expensive) than satellite**
  - **Fully symmetric channel**
  - **Economical (competitive pricing is available)**
- **Disadvantages:**
  - **Point-to-point connections introduce an issue of scalability**
  - **Pressure from the Internet solutions: VPNs etc.**
  - **Unused bandwidth is wasted**

Challenges of the Internet Transmission

The third way of transmitting over the Wide Area Network

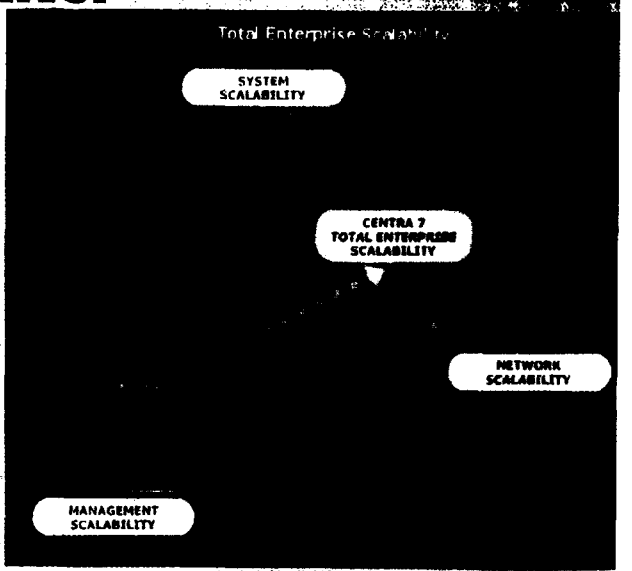
- **Advantages:**
  - -- low cost
  - -- wide-spread accessibility
- **Disadvantages:**
  - -- total lack of control over the transmission:
    - -- unpredictable delays
    - -- unpredictable bandwidth
    - -- unpredictable routing
  - -- limited scalability:
    - -- multicasting not widely available
    - -- multi-streaming costly
  - -- last mile problem is fully pronounced:
    in the remote areas, the final links of interconnectivity could be of poor quality



Internet Content Delivery Systems

Centra: an example of an Internet platform

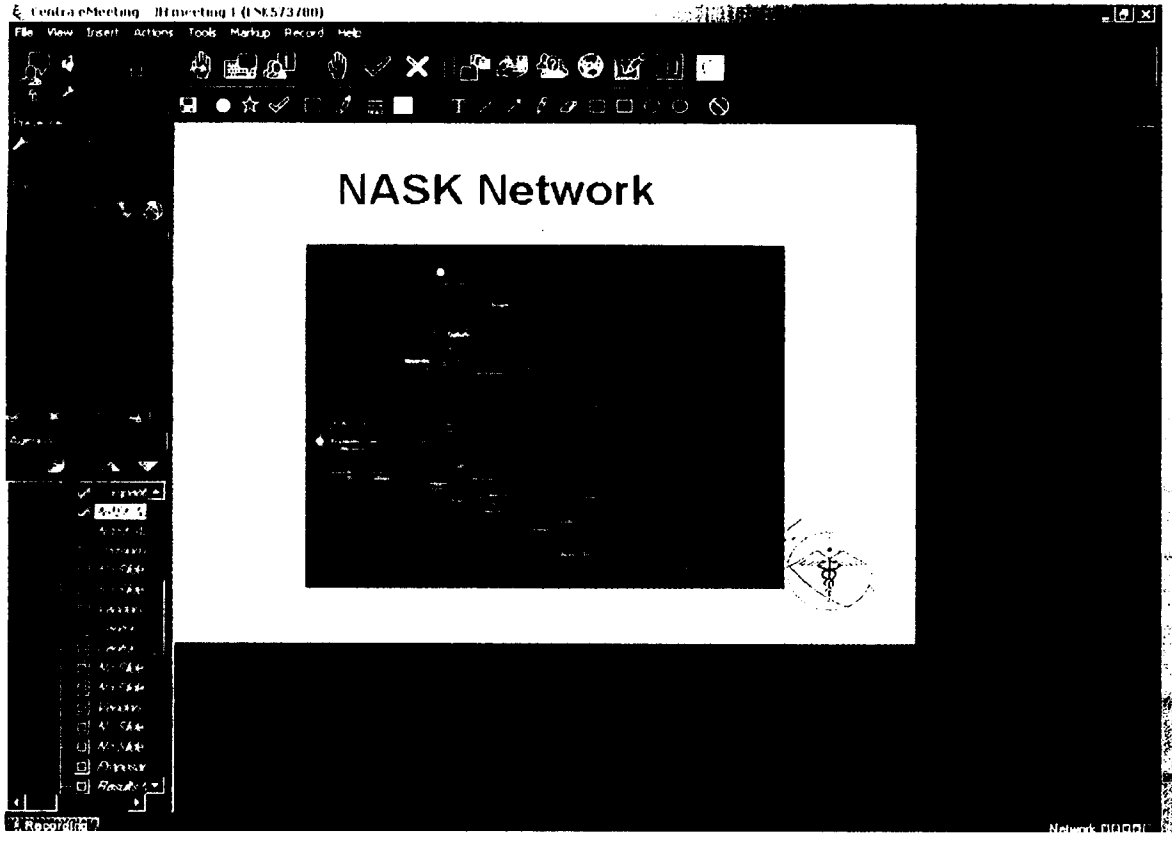
- Designed to *synchronously* (real time) deliver education to distance, distributed clients
- Supports simultaneously:
  - Duplex (two way) audio and text chat
  - Graphic images
  - Streamed video / Multimedia
- Recently rated as DoD software standard compliant



Considered for dialogue/feedback role in IMP programs

Centra – Benefits of Use

- Participation possible at low bandwidth over the telephone line
- Program centrally distributed from server, minimal local hardware and software requirements
- Low cost of transmission via Internet delivery



- Collaborative, real time communication between participants
- Concurrent channels graphic / audio / text

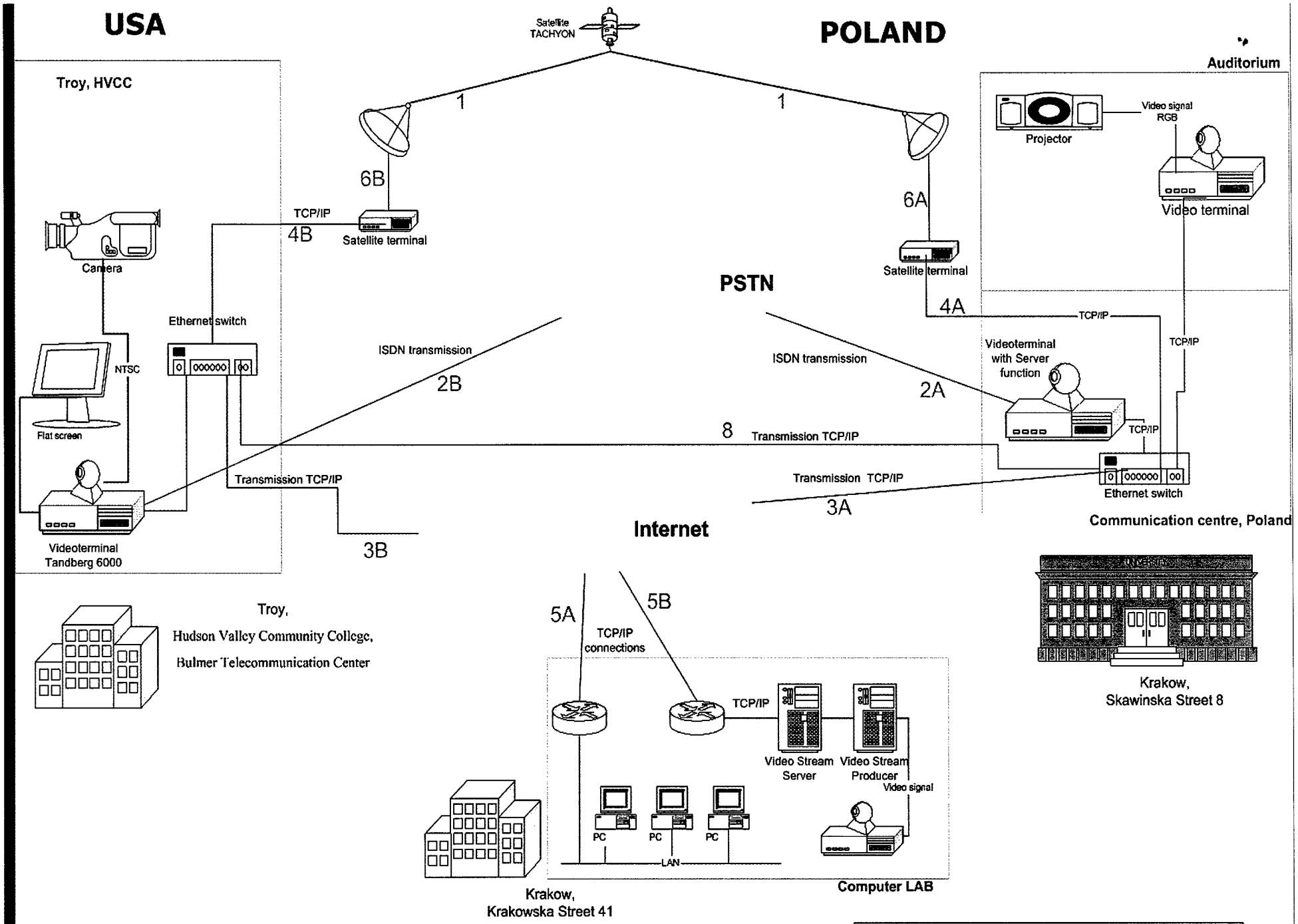
IMP Integrated Transmission Solution

IMP solution integrates different techniques to take advantage of their strength:

- **Long range communication is done over the reliable channel:**
  - **-- satellite, and/or**
  - **-- ISDN**

  with connection point-to-point (ISDN, satellite)
  or broadcast (satellite)

- **Each of the receiving sites transmits the program to:**
  - **-- an auditorium via a video-terminal, or**
  - **-- a group of user sites via the Internet or ISDN**

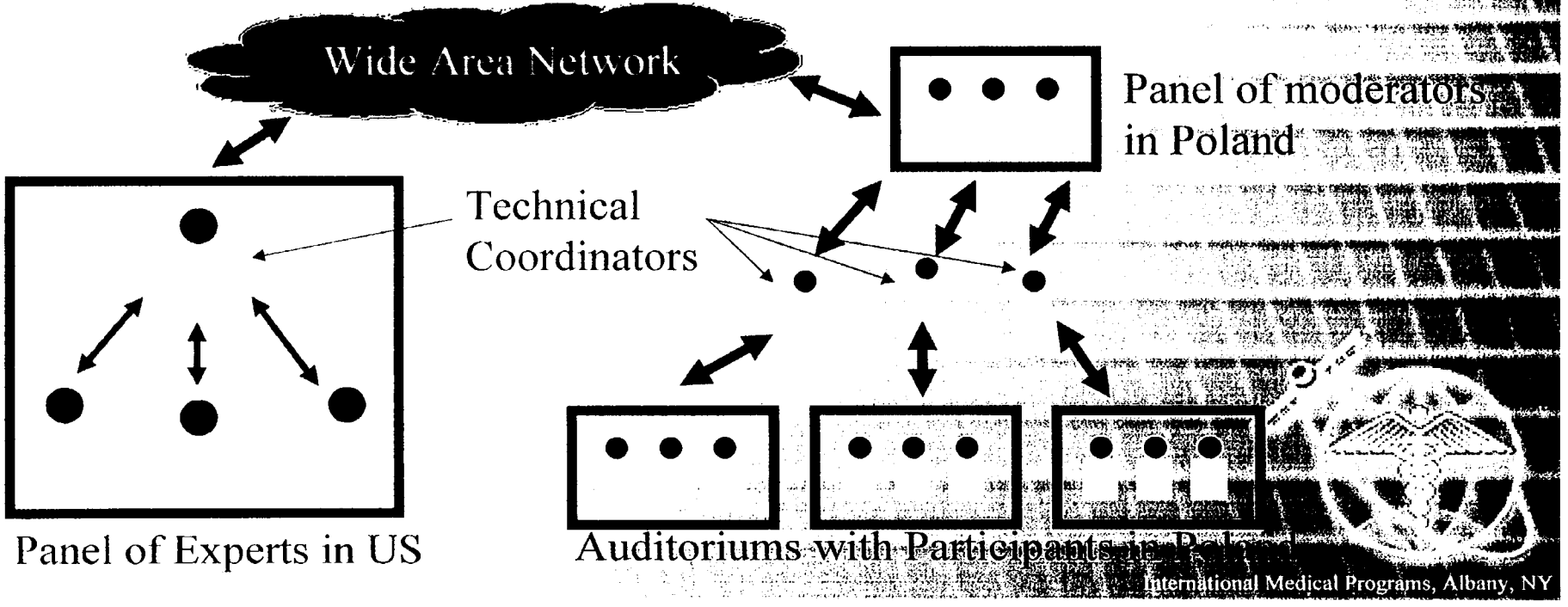


REVISIONS			
REV 1	Communication plan - Phase One	2004-01-30	APPROVED

Two-Tier interactions

- High cost of experts in US and of long range communication needed for program delivery makes scalability important but difficult because of the need to support interactions

- Proposed solution: use of panel of moderators to represent multiple audiences to the expert panel

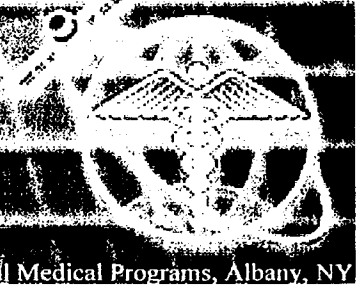


Polish Medical System

Peculiarities of Polish medical education & system:

- -- Short 5 year medical degree after high school
- -- Continuing education based on three degree of medical specialization that are done concurrently with the professional career
- -- No formal requirements for continuing medical education, but there is active pharmaceutical industry promotion program
- -- No private hospitals, so most of the doctors work in public hospitals and have placement privileges and maintain private or partnership practices

Conclusion: Continuing medical education programs are a novelty



Polish Telecommunication Infrastructure

Polish Internet capabilities are quite formidable

-- NASK supports the high speed network for research and education in Poland: it is a semi-government self-supporting organization

-- TP SA, privatized, formerly governmental telecommunication monopoly, supports most of the individual user's Internet needs, including ISDN lines, cable access etc.

-- Telenegria provides most of the fiber core for the Internet and deployed miles of fiber along electric power lines

-- Most of the homes and small enterprises still rely on the telephone modems

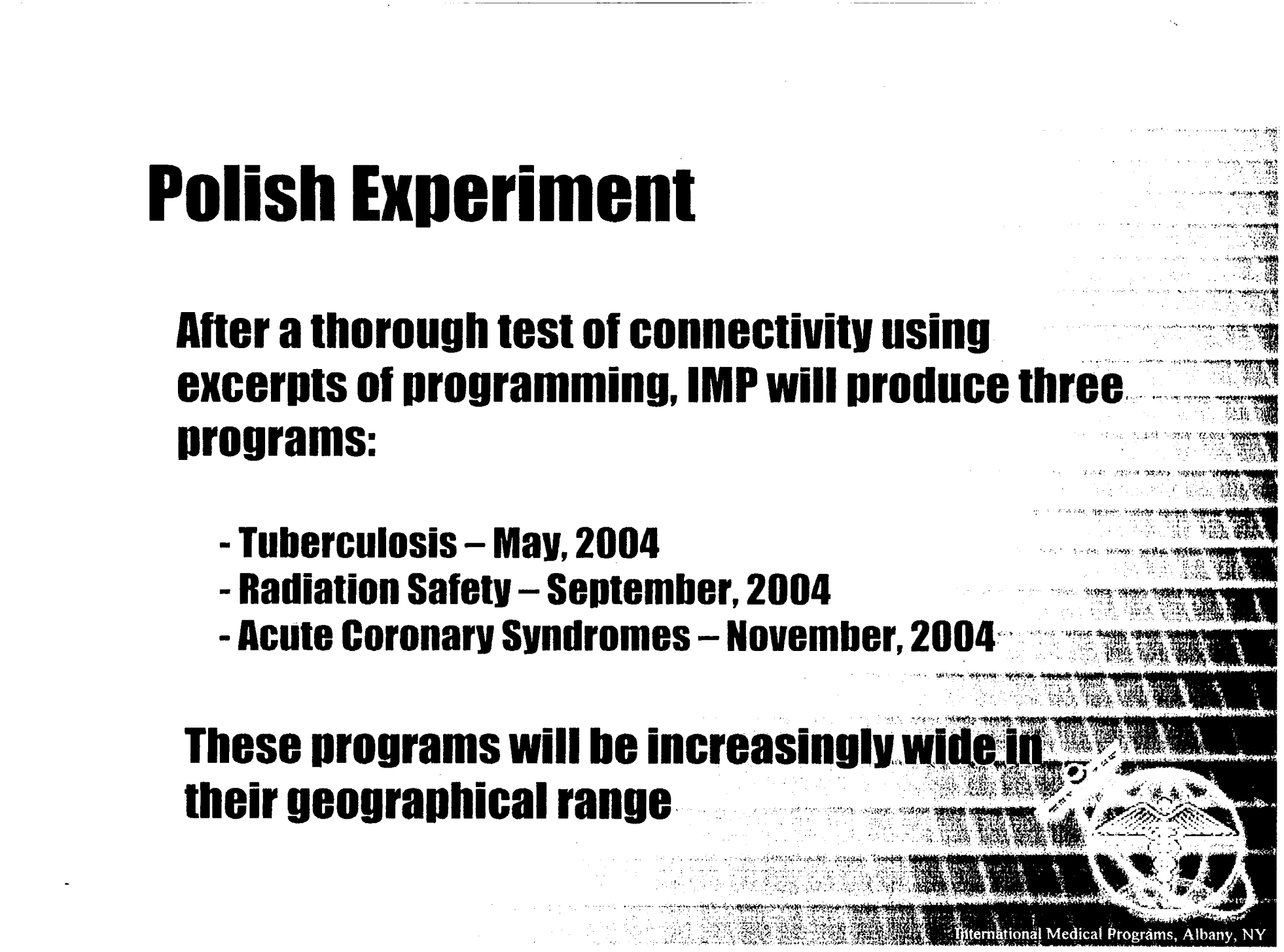
-- Larger cities have Metropolitan Area Networks

Polish Experiment

After a thorough test of connectivity using excerpts of programming, IMP will produce three programs:

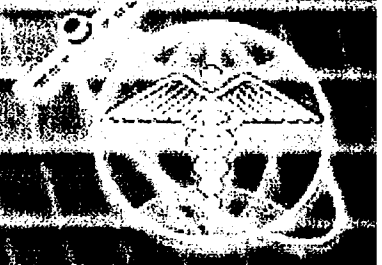
- **Tuberculosis – May, 2004**
- **Radiation Safety – September, 2004**
- **Acute Coronary Syndromes – November, 2004**

These programs will be increasingly wide in their geographical range



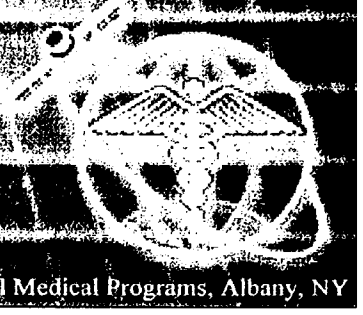
Future work - Eastern Europe

- Eastern Europe (Baltic Republics, Belarus, Ukraine, Moldavia, Western Parts of Russia) have even larger needs for modern medical education than Poland because they:
  - -- were cut off Western Medicine till a decade ago
  - -- lack tradition of private medical services
  - -- suffer from severe under-investment in the medical facilities
- Less advanced telecommunication facilities makes transmissions there even more challenging
- Poland has traditional ties with this region and existing medical collaborations make the current program a logical stepping stone to those regions



Conclusions

- Continued medical education for remote regions poses andragogical and technological challenges
- Integrated architecture combining different transmission technologies and tailored to the local telecommunication infrastructure is the only economically feasible solution
- Local medical community, practices and challenges dictate the content and topics of the program



APPENDIX E

Personnel

Employees:

Samuel S. Ciccio, M.D., Program Director/Principal Investigator
Christopher Lenaghan, Production Manager/Research Associate
Joan Salustri, Administrative Assistant
Catherine Plummer, Administrative Assistant

Ongoing Consultants:

Anthony P. Tartaglia, M.D., Principal/Medical Consultant
Daniel L. Weiner, M.D., Principal/Medical Consultant
Charles J. Cernansky, Technical Consultant/Research Associate
Boleslaw K. Szymanski, Technical Consultant/Research Associate