e Health:
From Training to Implementation:

Dr. Asif Zafar
MBBS, MCPS, M.D. FRCS, FCPS
Professor of Surgery,
Rawalpindi Medical College
Director, Telemedicine & E- Health Training Center,
Surgical Unit II, Holy Family Hospital, Rawalpindi
President Society of Surgeons Pakistan Rawalpindi –Islamabad
Founder member & Past President e – Health Association of Pakistan
Regional high level meeting on e/m Health
Bangkok, Thailand: 17-19 November 2013

Strategic Area 4: Human resource development

E Health:

Telehealth / Telemedicine

Case Study : Pakistan
eHealth Definition

- “the cost-effective and secure use of ICT in support of health and health-related fields, including healthcare services, health surveillance, health literature, and health education, knowledge and research”. (WHO-2007)

- “eHealth describes the application of information and communications technologies across the whole range of functions that affect the health sector, from the doctor to the hospital manager, via nurses, data processing specialists, social security administrators and - of course - the patients”

- – EU ICT
E-Health Applications

- Telehealth / Telemedicine
  - Use of ICTs to deliver health services, expertise and information over distance

- e-Learning
  - Delivery of individualized, comprehensive, dynamic learning content in real time, aiding the development of CMEs, and linking with experts.

- Health Informatics
  - Deals with storage, retrieval and optimal use of biomedical data, information, and knowledge for problem solving and decision-making
Telemedicine

Human resource

SYNERGY

Tools

Connectivity
Human Resource Development
Telemedicine / E-health training:

- Identify Collaborating Institutions
- Faculty Identification / Training
- Curriculum: Telemedicine Training Manual
- Telemedicine / E-Health Training Courses
- Hands on training
Telemedicine Training of Doctors & Nurses

Features:
1. 03 weeks training
2. Hands on experience on real time and mock cases
3. Visit to remote hospital in Pindi Gheb
4. Proposal Writing for introduction of Telemedicine in own institutes

Graduation Ceremony

Basic Computer Training

Training in Telemedicine Applications

On Line Lectures by US Experts

Hands on Training at Remote Site
Curriculum: Telemedicine Training Manual

Three Modules

Module I – 21 hours Basic Computer Training

Module II – 26 hours Basic Telemedicine Training
   On Line Lectures by US Experts

Module III – 18 hours Hands on Telemedicine Training
   At Holy Family Hospital.
   At Remote Unit in Pindi Gheb
# Module I – Basic Computer Training

<table>
<thead>
<tr>
<th>Day / Date</th>
<th>Time</th>
<th>Session</th>
<th>Appointment</th>
<th>Incharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday 4th</td>
<td>0830-</td>
<td>I</td>
<td>Registration of the trainees &amp; Pre-test of trainees</td>
<td>Asma Gul, Rida Bint-e-Naeem</td>
</tr>
<tr>
<td>June</td>
<td>1000</td>
<td></td>
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<tr>
<td></td>
<td>1000-1015</td>
<td>II</td>
<td>Welcome Address and Introduction of Faculty</td>
<td>Prof. Asif Zafar</td>
</tr>
<tr>
<td></td>
<td>1015-1100</td>
<td>II</td>
<td>Introduction to;</td>
<td>Prof. Asif Zafar</td>
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<td></td>
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<td></td>
<td>The training, training staff, training center</td>
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<td></td>
<td>1100 –</td>
<td>Break</td>
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<td></td>
<td>1130-1230</td>
<td>III</td>
<td>Introduction to Computers – Hardware</td>
<td>Mr. M. Rizwan</td>
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<td>1230</td>
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<td></td>
<td>1230-1400</td>
<td>IV</td>
<td>Introduction to Computers – Software</td>
<td>Mr. M. Rizwan</td>
</tr>
<tr>
<td>Thursday 5th</td>
<td>0900-1000</td>
<td>I</td>
<td>Operating Systems – Windows XP</td>
<td>Mr. M. Rizwan</td>
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<tr>
<td>June</td>
<td>1000</td>
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<tr>
<td></td>
<td>1000-1100</td>
<td>II</td>
<td>Microsoft Office – Word</td>
<td>Ms. Asma Gul</td>
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<td>1100</td>
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<td>1130-1230</td>
<td>III</td>
<td>Microsoft Office – Excel</td>
<td>Ms. Rida Bint-e-Naeem</td>
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<td></td>
<td>1230-1400</td>
<td>IV</td>
<td>Hands on training</td>
<td>Mr. M. Rizwan, Ms. Asma Gul,</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ms. Rida Bint-e-Naeem</td>
</tr>
<tr>
<td>Friday 6th June</td>
<td>0900-1000</td>
<td>I</td>
<td>Introduction to VCU</td>
<td>Dr. Azhar Rafique</td>
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<td></td>
<td>1000-1100</td>
<td>II</td>
<td>Microsoft Office – Power Point</td>
<td>Ms. Rida Bint-e-Naeem</td>
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<td>1100</td>
<td>Break</td>
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<td>1130-1230</td>
<td>III</td>
<td>Introduction to Internet &amp; Networking</td>
<td>Mr. M. Rizwan</td>
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<td>1230</td>
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<tr>
<td>Saturday 7th</td>
<td>0900-1000</td>
<td>I</td>
<td>Website Browsing and E-mails</td>
<td>Ms. Asma Gul, Ms. Rida Bint-e-</td>
</tr>
<tr>
<td>June</td>
<td>1000</td>
<td></td>
<td></td>
<td>Naeem</td>
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<tr>
<td></td>
<td>1000-1100</td>
<td>II</td>
<td>Scanning, Text and Audio Chat &amp; Videoconferencing</td>
<td>Ms. Asma Gul, Mr. M. Rizwan</td>
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<tr>
<td></td>
<td>1100</td>
<td>Break</td>
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<tr>
<td></td>
<td>1130-1400</td>
<td>III</td>
<td>Hands on Training</td>
<td>Mr. M. Rizwan, Asma Gul, Rida</td>
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<td></td>
<td></td>
<td>Bint-e-Naeem</td>
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# Module II – Telemedicine Training

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Session</th>
<th>Topic</th>
<th>Presenter(s)</th>
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<tbody>
<tr>
<td><strong>Monday 9th June</strong></td>
<td>0900 - 1000</td>
<td>I</td>
<td>Introduction to Telemedicine (Need, barriers, historic perspective)</td>
<td>Dr. Asif Zafar</td>
</tr>
<tr>
<td></td>
<td>1000-1100</td>
<td>II</td>
<td>Introduction to Telemedicine Software System</td>
<td>Dr. Faisal Murad</td>
</tr>
<tr>
<td></td>
<td>1100 - 1130</td>
<td>Break</td>
<td></td>
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<tr>
<td></td>
<td>1130 - 1300</td>
<td>III</td>
<td>Hands on training in telemedicine software</td>
<td>Mr. M. Rizwan</td>
</tr>
<tr>
<td></td>
<td>1330-1400</td>
<td>V</td>
<td>Telemedicine solutions for your own institute (preparation of Proposals for own institutes)</td>
<td>Dr. Faisal Murad Mr. M. Rizwan</td>
</tr>
<tr>
<td></td>
<td>1500-1600</td>
<td>IV</td>
<td>The Spectrum and Potential of Telecommunications Technology Hanoi</td>
<td>Dr. R.C. Merrell</td>
</tr>
<tr>
<td><strong>Tuesday 10th June</strong></td>
<td>0900 - 1000</td>
<td>I</td>
<td>Lecture on Telemedicine Applications</td>
<td>Dr. Azhar Rafique</td>
</tr>
<tr>
<td></td>
<td>1000 - 1100</td>
<td>I</td>
<td>Telemedicine technology, The Basics</td>
<td>Dr. Faisal Murad</td>
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<tr>
<td></td>
<td>1100 - 1130</td>
<td>Break</td>
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<tr>
<td></td>
<td>1330-1200</td>
<td>II</td>
<td>Introduction to Telemedicine tools: Cardiology, Dermatology, ENT</td>
<td>Mr. M. Rizwan Dr. Faisal Murad</td>
</tr>
<tr>
<td></td>
<td>1200 - 1230</td>
<td>III</td>
<td>Introduction to Teleconsultations</td>
<td>Dr. Faisal Murad</td>
</tr>
<tr>
<td></td>
<td>1230-1400</td>
<td>IV</td>
<td>Hands on Training in telemedicine tools</td>
<td>Mr. M. Rizwan Dr. Faisal Murad</td>
</tr>
<tr>
<td><strong>Wednesday 11th June</strong></td>
<td>0900 - 1000</td>
<td>I</td>
<td>Telemedicine Technologies (store, forward Vs Real time)</td>
<td>Dr. Faisal Murad</td>
</tr>
<tr>
<td></td>
<td>1000-1100</td>
<td>II</td>
<td>Telemedicine Issues – Privacy, Confidentiality &amp; Security; Regulations and Legislations</td>
<td>Dr. Faisal Murad</td>
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<td></td>
<td>1100-1130</td>
<td>Break</td>
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<td></td>
<td>1130-1300</td>
<td>III</td>
<td>Workshop Exercise on Proposal for Telemedicine solution of own institutes</td>
<td>Mr. M. Rizwan Dr. Faisal Murad</td>
</tr>
<tr>
<td></td>
<td>1300 – 1400</td>
<td>IV</td>
<td>Emergency Telemedicine</td>
<td>Dr. Faisal Murad</td>
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</tbody>
</table>
Telemedicine Training
Human Resource Development

Tele Pathology

Radiology
# Module III – Hands on Telemedicine Training

<table>
<thead>
<tr>
<th>Thursday 12th June</th>
<th>0900 - 1400</th>
<th>I</th>
<th>Teleconsultation with THQ Hospital Pish Ghel, Attock, DG Khan, Khushab</th>
<th>Dr. Faisal Murtad</th>
<th>Mr. Muhammad Rizwan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1200 - 1600</td>
<td>II</td>
<td>Wireless in Wonderland</td>
<td>Dr. L.C. Merrell</td>
<td></td>
</tr>
<tr>
<td>Friday 13th June</td>
<td>0900 - 1030</td>
<td>II</td>
<td>Home Telemedicine, Tele Pathology</td>
<td>Dr. Imtiaz</td>
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<td>1100 - 1130</td>
<td>Break</td>
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<tr>
<td></td>
<td>1130 - 1230</td>
<td>III</td>
<td>Clinical Applications &amp; Case Studies – Telesurgery</td>
<td>Dr. Asif Zafar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1300 - 1315</td>
<td>IV</td>
<td>Clinical Applications &amp; Case Studies – Tele Cardiology</td>
<td>Dr. Faisal Murtad</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1315 - 1400</td>
<td>V</td>
<td>Clinical Applications &amp; Case Studies – Tele Dermatology, Tele Radiology</td>
<td>Dr. Ashta Elsaa</td>
<td>Dr. Qasim Ali</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Saturday 14th June</th>
<th>0900 - 1000</th>
<th>I</th>
<th>Clearance Examination on Mock and real time cases</th>
<th>Dr. Faisal Murtad</th>
<th>Mr. M Rizwan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1000 - 1100</td>
<td>II</td>
<td>Reviews of Proposals and Presentation</td>
<td>Dr. Asif Zafar</td>
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<td></td>
<td></td>
<td></td>
<td>Finalization and submission of Proposals</td>
<td>Dr. Faisal Murtad</td>
<td></td>
</tr>
</tbody>
</table>

**Certificate Distribution Ceremony**

<table>
<thead>
<tr>
<th>1100</th>
<th>Arrival of the Chief Guest</th>
<th>Dr. Raza Sheikh, Dr. Faisal Murtad</th>
</tr>
</thead>
<tbody>
<tr>
<td>1130 - 1215</td>
<td>Certificate Distribution Ceremony&lt;br&gt;• Briefing of the Project: Telemedicine/E-Health Training Centre, by Project Director, Professor Asif Zafar Malik.&lt;br&gt;• Certificate Distribution to Course participants.&lt;br&gt;• Address by Chief Guest</td>
<td>Dr. Asifa</td>
</tr>
<tr>
<td>12.45 - 1.00</td>
<td>Visit of Telemedicine Center&lt;br&gt;Demonstration &amp; Consultations</td>
<td>Dr. Faisal Murtad</td>
</tr>
</tbody>
</table>

| Training Lab | Rula, Asma |
| Minimal Invasive Surgery | Dr. Faisal Murtad |
| Refreshment |
Module III – Hands on Telemedicine Training
Module III – Hands on Telemedicine Training
Telemedicine Training Courses 05-06

Total Telemedicine Courses 2005: 04
Total number of Trainees: 45
✓ Total No of Doctors: 35
✓ Total No of Staff Nurses: 10

Telemedicine Training Courses 2008

Total Telemedicine Courses 2008: 05
Total number of Trainees: 56
✓ Total No of Doctors: 41
✓ Total No of Staff Nurses: 12
✓ Total No of Technicians: 01
✓ Total No of Students: 02
Human Resource Development - Promote knowledge management, education in ICT, and better access to information as a key element for health promotion

Objective 4.1 –
Training in ICT
National Telemedicine Training

University of health Sciences, Lahore, Punjab
E Health Included

- Undergraduate Medical & Nursing Curriculum

COMSATS university
- Diploma / Masters Programs
Human Resource Development - Promote knowledge management, education in ICT, and better access to information as a key element for health promotion

Objective 4.2  CME

• eLearning
e Learning!
Continuous Medical Education

- Distance / e Learning
- Lecture of the week
- Surgical Atlas
- Tutorials
Distance Learning!
Demonstration of Procedures Online
Clinical Decision Support System

Intra operative Critical Decisions!
National Minimal Access Surgery Training Program
HEC Collaboration

Higher Education Institutes on PERN

[Diagram showing network connections between various institutes]

Legend:
- 10G Link
- 1G Link
- Multiple of 1G Link (Planned on Long Haul)
- 1G Link (Planned on Long Haul)

Institutions:
- HEC(KH)
- HEC(ISB)
- HEC(PESH)
- HEC(LHR)
- BUITMS(QTA)
- AUFS(ESB)
- BUZU(MLT)
- UST (KNU)
- NUST
- IBA
- UET
- NUML
- COMSATS
- FST
- KDU
- FIC
- Quaid
- NUST
- Shahi Khan Lab
- eRA
- RA/LA
- POP
- Campus
Minimal Invasive Surgery Training
Pakistan Education & Research Network (PERN) is amongst the flagship projects of the Higher Education Commission, Pakistan and an integral part of the overall education system of the country, which interconnects all public and private sector universities and institutes of higher learning across the country. PERN being the information highway provides ultra-high speed communication infrastructure for collaborative research in the field of high energy physics, bioinformatics, disaster management, agriculture field research, and tele-medicine, to the higher education institutes and research organizations in the country.

PERN & Society of Surgeons
Joining hands for the promotion of Telehealth in Pakistan
Digital Ultrasound Training For Afghan Doctors
MDM (Tumor Board Meetings)

HFH
Surgeons, Radiologists & HistoPathologists
All new Cancer patients (Indoor / Outdoor)
Requiring Oncological Opinion during Management

NORI
Oncologists / Radiology / Pathology
New and Referred Patients
Requiring Surgical Opinion/Intervention during management
Referral from Remote Site: Attock

- Left abdominal mass tumor: USG & CT Abdomen & pelvis
  Echo mixed mass 13 x 10 cm in size in left suprainguinal region.
  **Tumor markers**: Beta-HCG levels – raised
Snap shot of Tumor Boards  HFH : NORI: SGPMI
Lucknow
Human Resource Development - Promote knowledge management, education in ICT, and better access to information as a key element for health promotion

Objective 4.4

Promote research using e/mHealth tools
Research & Development in e-Health
Pakistan

Rawalpindi Medical College: Holy Family hospital

- Telehealth: Capacity Building / Multitasking
- Emergency Telemedicine response Kits
- Mobile telehealth
- Virtual Grand Rounds teaching Concept
- Minimal Access Surgery: Tele Mentoring
- Simulation Software / Tele surgical Robotic arm
- Tele presence Robot
- Clinical Decision Support System
Emergency Response Telemedicine Vehicle

Enhancing Medical Care for Internally Displaced Persons
Research & Development in e-Health Pakistan

NUST University Islamabad

- Healthcare Applications Interoperability through Implementation of HL7 Web Service Basic Profile

FAST University Islamabad

- Next Generation Intelligent Networks Research Center
- Remote Patient Monitoring System with Focus on Antenatal Care

LUMS, LAHORE

- A Low Cost Ultrasound Training Simulator
- Investigating Wavelet based Video Coding and Video Conference Applications
Human Resource Development - Promote knowledge management, education in ICT, and better access to information as a key element for health promotion

Objective 4.3

Disease Prevention

Health Education Promotion to mass population
Research & Development in e-Health
Pakistan

Aga Khan University

PANACeA project

(PAN Asian Collaborative for Evidence-based eHealth Adoption and Application)

• Research in e-Health in 12 Asian countries.
  • Use of Mobile Phone in Bridging the Gap for Referral of Pregnant Women
  • Mainstreaming e-Health initiatives in primary care: an evidence-based approach
  • Online TB Diagnostic Committees for Clinically Suspect Sputum Negative Patients in the TB-DOTS Program
Human Resource Development - Promote knowledge management, education in ICT, and better access to information as a key element for health promotion

Objective 4.5

Utilization of m health Tools

• Emergency & Major Disaster Response
Emergency Telemedicine Response

- Earthquake: 2005
- Internally Displaced Persons: Mass migration: 2009
- Floods: 2010
- ITU & Emergency Telemedicine Response

Mobile Telemedicine Centers
Multitasking of Telemedicine center
Tele-Rehabilitation for Paraplegics
Future Directions

• National Replication

• Regional / International Collaboration