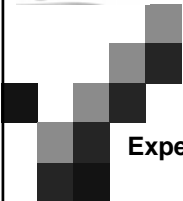


Telemicine HEALTH Training Center

Surgical Unit 2



## TELEMEDICINE Concepts, Scope & Experience in Major disasters in Pakistan

**Dr. Asif Zafar Malik**  
MBBS, MCPS, M.D. FRCS, FCPS  
*Professor of Surgery, Rawalpindi Medical College  
Consultant Surgeon  
Holy Family Hospital, Rawalpindi, Pakistan*

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**Consultant Surgeon**  
Holy Family Hospital, Rawalpindi

**Project Director**  
Telemicine / E-Health Training  
Project

**President**  
Telemicine Association of  
Pakistan




Telemicine HEALTH Training Center

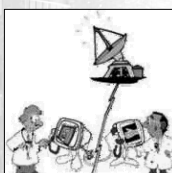
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### Outline of today's presentation

- **Telemicine / e-health concept & Scopes**
- Earthquake in Pakistan -an overview
- Telemicine - Role in disaster Management
- Telemicine / E-Health Training Center
- Lessons Learnt!!
- Regional & International Collaboration

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## TELEMEDICINE


### Concepts & Scopes

Telemicine HEALTH Training Center

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## TELEMEDICINE

"The use of medical information exchanged from one site to another via electronic communication for the health and education of the patient or health care provider and for the purpose of improving patient care".




(The American Telemicine Association)

Telemicine HEALTH Training Center

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## TELEMEDICINE REQUIREMENTS

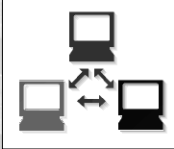
1. Network, Connectivity
2. Telemicine Tools
3. Trained Health Professionals



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# TELEMEDICINE REQUIREMENTS

## CONNECTIVITY



- Telephone Lines
- ISDN, Lease Lines
- Fiber Optics
- Radio Modems
- Satellite Links

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# TELEMEDICINE REQUIREMENTS

## TOOLS

- Computers
- Peripheral Attachments (etc ...)
- Video Conferencing
- Dedicated Software (customized to Pak.)

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# TELEMEDICINE METHODOLOGY

- Store & Forward
- Two way Interactive Television (Video Conferencing)

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## STORE & FORWARD



Useful for Non-Emergency Consultations

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## TWO WAY INTERACTIVE CONFERENCING



- Face to Face consultation in Real Time
- Requires *High Speed Internet* (> 128 KBps, ISDN, Lease etc)
- Dedicated Hardware and Software necessary for Professional Output

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# TELEMEDICINE APPLICATIONS


- Early Intervention
- Emergency & Trauma Care
- Tele- Surgery
- Tele – Dermatology
- Tele – Cardiology
- Tele – Psychiatry
- Tele – Radiology

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## TELEMEDICINE APPLICATIONS

### - EARLY INTERVENTION -

**EMERGENCY & TRAUMA CARE**      **URGENT 2<sup>nd</sup> OPINION**



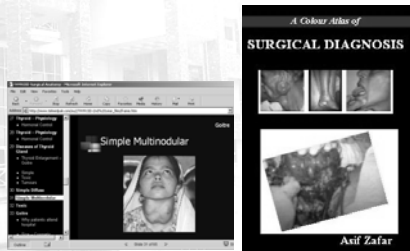
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## TELEMEDICINE APPLICATIONS

### MEDICAL EDUCATION

- Distance Learning

Lecture of the week  
Surgical Atlas  
Tutorials




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## TELEMEDICINE APPLICATIONS

### MEDICAL EDUCATION

Demonstration of Procedures Online



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## Earth Quake of Pakistan





# Earth Quake of Pakistan

Magnitude 7.6

86,000 people lost their lives

69,000 injured

Heaviest damage occurred in the Muzaffarabad area

Estimated 4 million people in the area left homeless



# Earth Quake of Pakistan

TABLE 3: SUMMARY OF DAMAGE TO HEALTH CARE SYSTEM IN THE AFFECTED AREAS

Type of Health Institution/Offices	Number Fully Damaged	Number Partially Damaged	Estimated Replacement cost in Pak Rs in million
Tertiary Care Hospital	-	1	500
Secondary Care - District, Tehsil Headquarters and Civil Hospitals	16	13	6,678
First Level Care Health Facilities (RHCs, BHUs and MCH Centers)	203	68	8,091
Other Health Facilities( Dispensaries, First Aid Posts etc)	219	34	159
Health Management Offices	17	3	318
<b>Total Health Facilities</b>	<b>455</b>	<b>119</b>	<b>15,866</b>
Loss of vehicles/motorcycles	216	-	22
<b>Total</b>			<b>15,888</b>

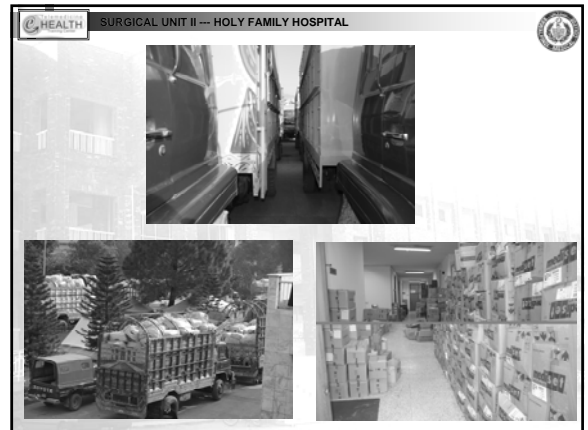
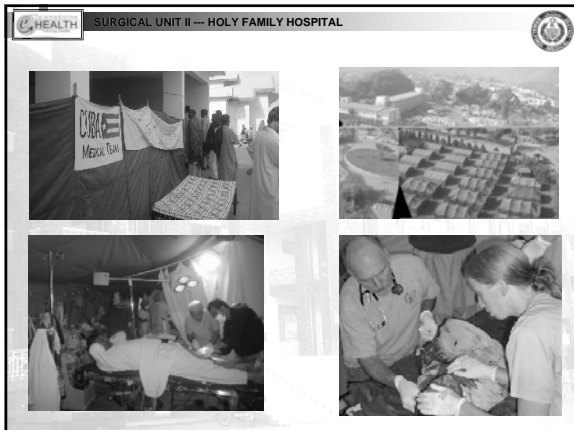


# RMC Allied Hospitals

- No of pts 5544
- Surgeries Performed 2035
- Amputations/paraplegia 87/144
- Mortalities 89
- No of discharges 5169
- Present Admissions 26







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## How did we respond!

### Remarkable

The entire Nation stood up to the Challenge  
Surgeons from all over the country were no exception

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## Outline of today's presentation

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- **Telemedicine - Role in disaster Management**
- Lessons Learnt!!
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## Telemedicine in Disasters

- Telemedicine applications for disaster emergencies by many countries.
- First Telemedicine application in disasters : Mid 1980's
- NASA to furnish disaster aid following earthquake in Mexico City : 1985
- US-USSR Space Bridge Project : 1988

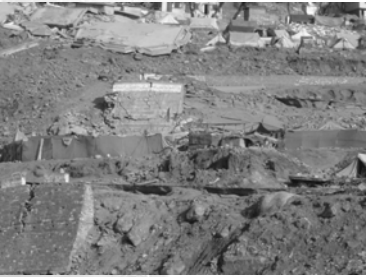
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## Disaster types

- Man Made
- Natural


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### Role of Telemedicine in Disaster Management Pakistan Experience




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### Remains of T.H.Q Balakot



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### Remians of B.H.U Shohal Najaf



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### Remains of Civil Hospital Gharhee



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### Telemedicine in Disaster Management - Experience in Pakistan

**Initiative of!**

MOIT  
ITU  
PASHA  
INTEL  
Telemedicine & e-health center holy family  
hospital

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### Telemedicine & E-health training center

**Identified as only center in the country  
to play its role in Telemedicine in  
disaster situations.**

- Hub at Holy Family Hospital
- Centers in NWFP
- Centers in AJK
- Two centers in referral step down hospitals

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# "Telemedicine / e-health Training Project"



Pak-US Collaboration in S&T


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## Telemedicine - Role in disaster Management

- Hub & Remote centers in disaster area
- Step down hospitals
- Follow up
- Rehabilitation
- Multitasking

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## Hub at Holy Family Hospital



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## Role of Hub at Holy family hospital

- Customization of Telemedicine Software for disaster relief
- Training of Volunteers in Telemedicine consultations
- Respond to Teleconsultations from relief camps at disaster site.
- Coordination of relief activities with P.M RELIEF Cell in Islamabad.
- Addressing day to day needs of Earthquake victims

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## Role in Disaster Management

- Customization of Telemedicine Software for disaster relief



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## Role in Disaster Management


### Training of Volunteers in Telemedicine consultations



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## Role in Disaster Management

- Setting of telemedicine centers
- Shoal Najaf / Balakot



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## Mobile Telemedicine Setup



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## Role in Disaster Management

- Collaboration with Foreign Relief Missions
- Cuba/ Turkey / UAE
- NGO'S
- Pakistan Govt. relief missions



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## Mobile Telemedicine centers

Centers in Shoal Najaf Balakot NWFP




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## Role in Disaster Management

- Setting of telemedicine centers

Centers in AJK - Muzaffarabad




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## Role in Disaster Management

- Setting of telemedicine centers


> Centers in AJK - Hattian Bala



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## Role in Disaster Management

- Setting of telemedicine centers
  - Centers in AJK - Muzaffarabad



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## Role in Disaster Management

- Collaboration with VCU / NASA Experts



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## Results

- Teleconsultations with Specialists
- Referred cases were sent to the tertiary hospitals in a state of complete "surgical preparedness".
- The stay in the hospital was minimized.
- Speedy treatment was ensured.

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## FOLLOW-UP OF EARTHQUAKE VICTIMS IN A REMOTE HOSPITAL USING TELEMEDICINE

- Telemedicine centers in Step down hospitals : Pindi Gheb / Attock



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## Victims initially managed at RMC and Allied hospitals later Transferred to step down hospital

1. Follow up of trauma patients remotely without the need to travel to main center
2. Assessment of missed injuries
3. Reducing follow up visits

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## Remote Supervision

Patient management by a team

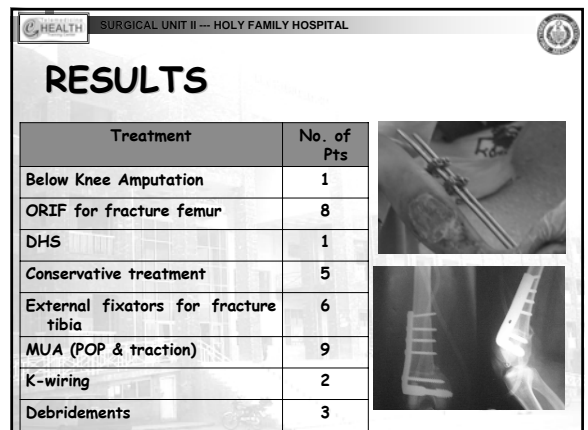
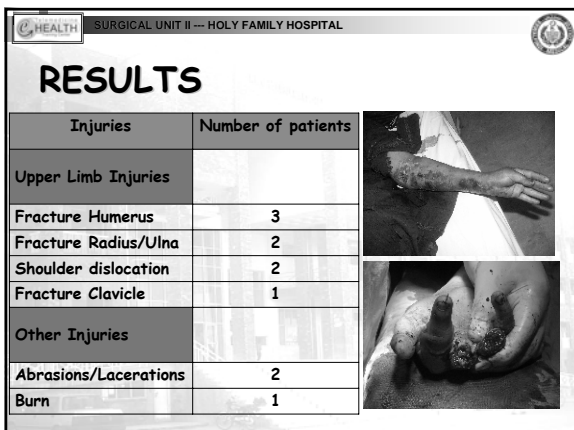
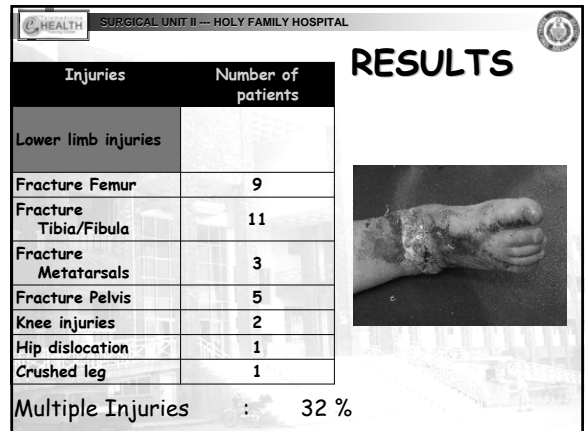
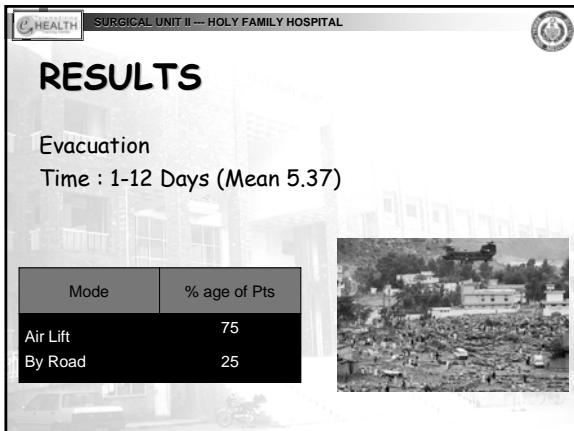
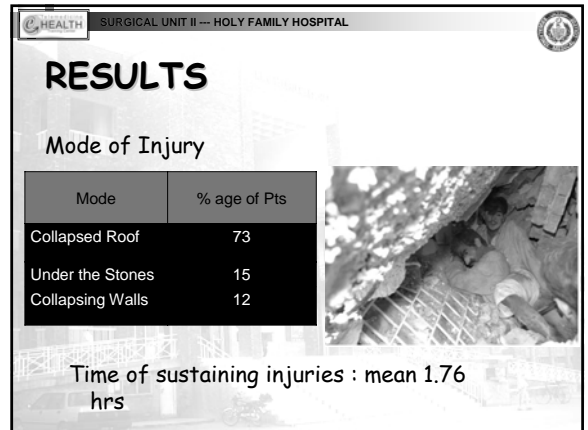
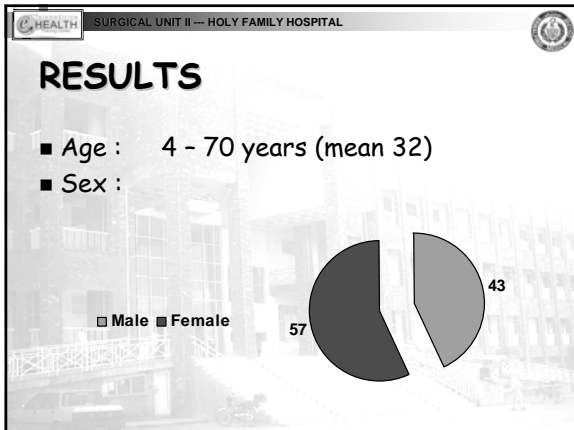
- a junior doctor (properly trained and certified by TETC)
- Medical staff at step down hospital

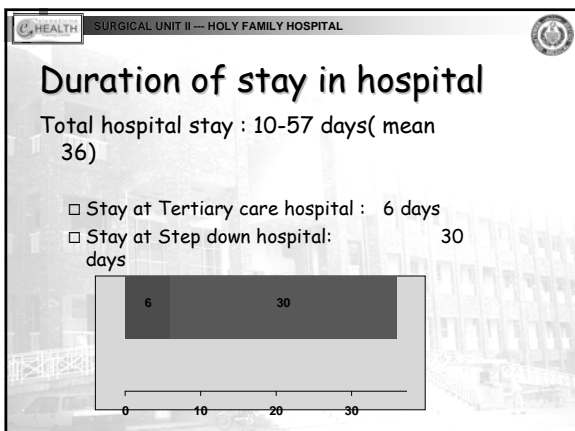
Consultation/Communication facilitated by

- Assistance from an IT person

Panel of consultants at Tertiary Care Hospital

- General & Orthopedic surgeons
- Whole time availability



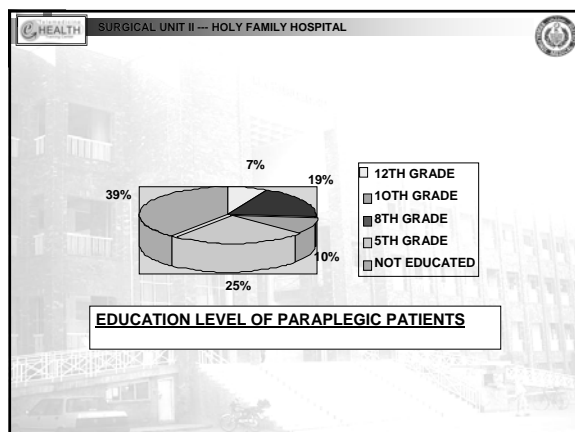
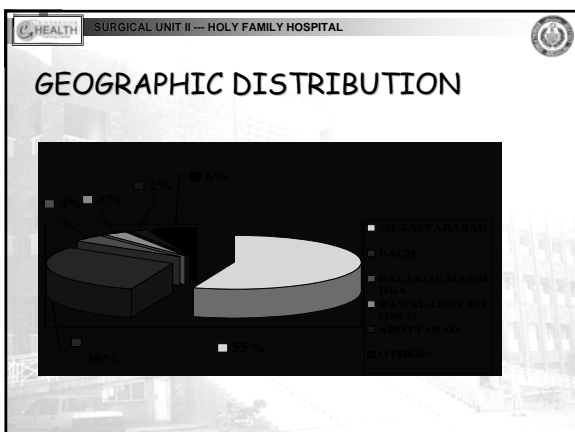
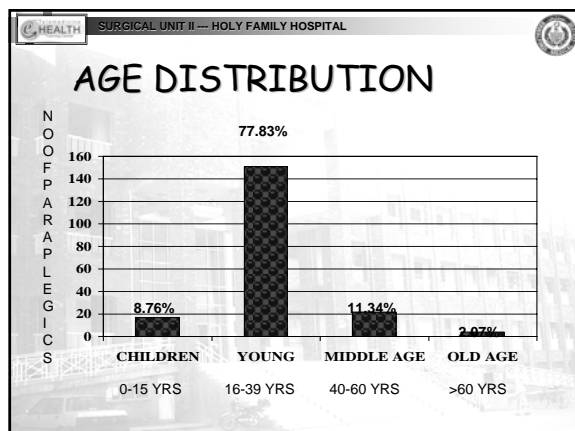


- CONCLUSION**
- Significant reduction in readmissions to tertiary care hospitals.
    - Reduces the burden on main trauma care centers.
  - Peripheral hospitals can be safely upgraded through telemedicine during the disaster situation

**Telemedicine-Role in REHABILITATION**


**Experience in Paraplegics - victims of Earthquake**

PLACE OF STUDY	NUMBER OF PATIENTS
Rawalpindi medical college and allied hospitals	144
Melody relief and rehabilitation center, Islamabad	76
Total patients	216
Patients discharged before evaluation	22
Sample for research	194



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### CHECKING BASIC COMPUTER SKILLS OF PARAPLEGICS



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### RESULTS OF BASIC COMPUTER SKILL PROFORMA

CATEGORY	YES	NO
Computer user	92%(11)	08%(1)
Comfortable with computer use	92%(11)	08%(1)
Internet users	16%(10)	84%(2)
Comfortable with internet use	16%(10)	84%(2)
Operate MS office	50%(6)	50%(6)

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### WILLINGNESS FOR COMPUTER TRAINING

- 85% patients are willing for computer training.
- 9% patients have basic computer skills.
- Among illiterate patients 70%(137) have at least one educated family member.



■ WILLING  
■ NOT WILLING

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### WORKSHOP FOR PARAPLEGICS AT TELEMEDICINE TRAINING CENTRE



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### CONCLUSION


- Computer skills of paraplegics and their attendants can be used as a tool in their rehabilitation
- Rehabilitation while based at tertiary centers should include basic training of paraplegics and their attendants.

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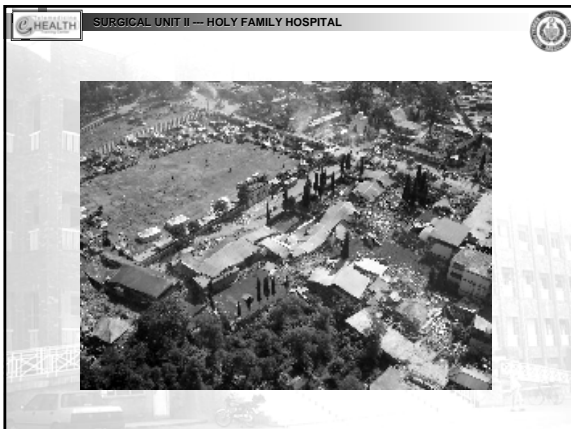
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What have we learnt!!!



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**Disaster plans ???**  
**Emergency preparedness**

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**LESSONS:**

**Lack of  
&  
Difficulties  
in  
Co-ordination !!**

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**LESSONS!**

One of the most significant problems in mass casualty management is that we do not prepare for disasters; we respond to them.



## Major Concerns

- Impact of disaster - immediate and consequences linger over time
- Health surveillance must survey extent and patterns of injuries
- Immediate response requires documentation regarding incidence
- Relay of accurate information to command and control



## Information usage

### According to International Federation of Red Cross:

- Information alone can save lives. But there are gaps in the way we gather and share this powerful resource.
- Timely information is a form of disaster response in its own right.
- Information reduces suffering in the wake of disaster.

*-International Federation of Red Cross, World Disaster report 2005*

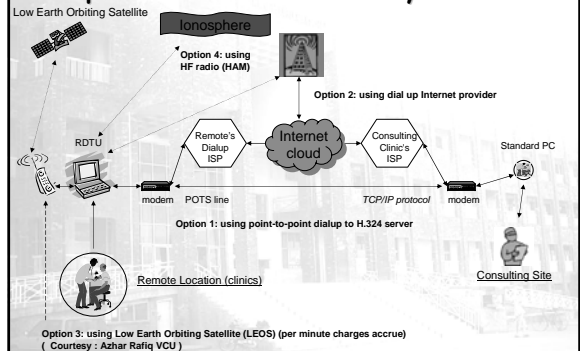


## Options for communication

- Wired (point to point connectivity)
  - Plain old telephone system (POTS)
  - Fiber optic lines
- Wireless (point to multi-site connectivity)
  - Cellular phone network
  - Radio Frequency (RF) communication
  - Satellite phone communication



## Options for data relay



## Conclusions

- It is essential to develop cost-effective equipment, software, interface elements and increased access to the communication satellite capacity.
- It is important to exchange information on medical practices and to standardize the medical data format.
- Integrate the application of telemedicine into other thematic areas: natural disaster management and environmental monitoring.



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## 4th APT workshop, Rawalpindi 2006

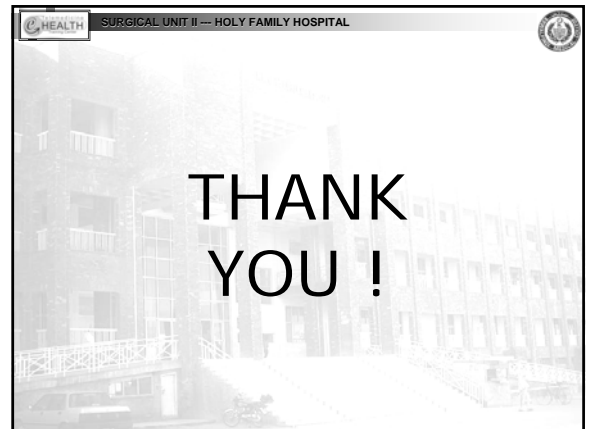
Jointly organized by

- APT
- ITU
- Tokai University, Japan,
- Telemedicine Association of Pakistan
- Telemedicine / E-Health Training Center.



4th APT Telemedicine Workshop 2006  
RAWALPINDI PAKISTAN  
25th - 26th January 2006  
Organized by  
Telemedicine Association of Pakistan  
Tokai University, Japan  
ITU  
Telemedicine / E-Health Training Center

Special session on **Role of Telemedicine in Major Disasters**



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## Websites

[www.telemedicine.pk](http://www.telemedicine.pk)

[www.tapak.org](http://www.tapak.org)