

# Organization of Disaster Relief Team for Earthquake Victims

HAFIZ-UR-REHMAN

## ABSTRACT

**Objective:** To organize disaster relief teams in every medical non medical institution irrespective of fields, government, non-government like scouts, civil defence and NCC.

**Design Duration:** Experience of team orthopaedics unit –1, with other members of different departments of DUHS/Civil hospital Karachi and literature review of experiences of different disaster relief teams in different earthquake disaster places in the world up till 2012.

**Setting:** A team of 31 volunteers managed more than 380 orthopaedics trauma victims of 7.9 magnitude earthquake in Pakistan.

**Methodology:** With collaboration of Higher Education Commission and Higher Government Authority Islamabad established a field base camp tent hospital at Battagram replacing District Head Quarter Hospital District Battagram, N.W.F.P.

Experiences of different disaster teams, data collected through literature published in national and international recognized journals.

**Results:** -Out of 380 patients of different age group male were 170 (44.26%) and female 210(55.76%). 362 patients were managed conservatively and surgical procedures done upon 14 (3.68%) and 4 (1.05%) cases referred to major hospital.

**Conclusions:** Disaster Relief Team doesn't mean a team of medical expertise, staff nurse and paramedical staff because the place where we are going to give medical facilities; that is devoid of all necessities of life for human being. The team should consist of doctors, paramedical staff (O.T. technician, male attendant, staff nurse, sweeper, cook, plumber cum electrician, etc.

Medical and non medical organization should educate and train to staff for such emergency situations just like civil defence, NCC and. scouts. Especially they would be trained of Primary Trauma Care Provider, Basic Life Support and C.P.R.

## INTRODUCTION

The October 2005 earthquake that struck the northern parts of Pakistan was the most devastating natural disaster to affect the nation. It made colossal damages by killing over 73,000 people, injured over 128,000, over 5,000 educational facilities destroyed and killed over 18,000 children, 600,000 houses destroyed and rendered 3.5 million people homeless in an area of 30,000 square kilometers rugged mountainous terrain. A reconstruction bill of over 5 billion USD was left behind for the nation.(1)

The ground beneath our feet seems rock-solid, but our planet's surface is in fact a dynamic grid of

slowly moving sections, known as tectonic plates. Normally, this motion is imperceptible to humans, showing itself only on geological time. The movement causes stress to build in the crust. If the stress rises beyond a critical threshold, a portion of the crust will give way, shifting suddenly and violently. This sudden motion usually occurs along a fault or fracture – a zone of weakness in the earth's crust. The result is what we call an earthquake.(2)

Joseph Wallach, a geologist at the University of Ottawa explains. "You can only push a rock so far," "At a certain point in time, the rock will fail, and you'll have an earthquake." Ninety per cent of earthquakes occur along the boundaries of tectonic plates, but they can also happen in more stable regions, thousands of kilo meters from the plate edges.(3)

The destructive power of an earthquake depends on the depth of its point of focus. The spot on the earth's surface directly above the focus is called the "epicentre." Earthquakes can also occur beneath the ocean; such oceanic quakes

---

Correspondence Address: Dr. Hafiz-ur-Rehman, Assistant Professor, Department of Orthopaedic Surgery, Al-Tibri Medical College, Old Thana, Gudap, Malir Karachi.

*Email: hafeezortho@yahoo.com, hafeez.ortho.pk@gmail.com*

can trigger enormous tidal waves, or tsunamis. These waves can travel great distances at speeds of up to 1,000 kilometres per hour, attaining heights of up to 15 metres as they reach the shore.(4)

The real key to surviving an earthquake and reducing your risk of injury lies in planning, preparing, and practicing what you and your family will do if it happens. Far in advance, you can identify and reduce possible hazards in your home, and practice what to do during and after an earthquake. Learning what actions to take can help you and your family to remain safe and healthy in the event of an earthquake or any kind of disaster.

### Methodology

The team of 31 volunteers departed Karachi on 11<sup>th</sup> October 2005 at 19.30 hrs with PIA to Islamabad and later then Mansehra to Battagram with a view to replace demolished District Hospital with Field Hospital in tents. This area has enormous enchantment of disaster victims. Higher Education Commission and Population Welfare Department helped us in transportation and all necessary assistance.

When we reached at Battagram there camp was already established by different international organizations with collaboration of non-medical local and national organization without orthopaedics expertise under the security and supervision of respective army officials.

In the presence of expertise the task of our team was to manage orthopaedics trauma cases and to establish an orthopaedics department with operation theatre, recovery room and O.P.D.

All camps were placed away from prohibited buildings and hills; residential camps were closed to working place respectively.

The place given to us for establishment of orthopaedics department was in the ground of school (Elama Iqbal open university). Estonian disaster relief team was already working there with a single operation theatre. We learnt lot of principles other than management of patient about disaster relief camp from Estonian disaster relief team.

Higher authority at Islamabad provided a truck full of tents, food and mineral water with a cook at the time of departure from Islamabad. Most of us were not trained to fix tent. We fix tent by ourselves one by one; junior doctors were more helpful and energetic to work in camping. It was first experience of our disaster relief team but hard

working and strong desires of team members made us so strong and expert no one can say that the members of Dow University disaster relief team are un-experienced and un-trained.

When we started work, Estonian volunteers were impressed to see our work; they helped us by providing their O.T. and also made two more O.Ts. Estonian disaster relief team which contributed in terms of general anaesthesia, operation theatre and equipments. A local Private Hospital also offered its operation theatre facilities, which was latter declared dangerous building due to repeated earthquake tremors.

We were short anaesthetists one of us became a blessing; with his efforts we performed pain free major and minor procedures. He induced general anaesthesia to more than 300 cases with ketamine and Valium. In four days we performed 300 cases under Ketamine anaesthesia, rest of 80 cases managed under local anaesthesia with heavy sedation.

### RESULT

On the first day specific orthopaedic trauma management given to indoor patients, and second day started O.P.D. managed more than 150 cases. On the, third day managed 130 cases and on fourth day 100 cases. We were able to perform all procedures perfectly and constantly informing our honorable H.O.D. (Head of the Orthopaedic department) on cell about progress and further plan. We managed all patients with hard working, achieved goal of task given by Government.

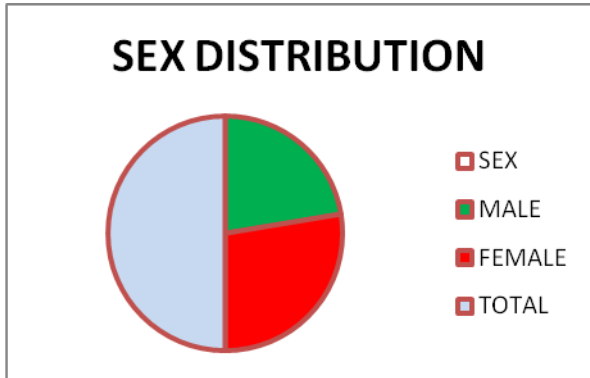
**Medical facilities offered by our team:** 1-O.P.D., 2- Pharmacy, 3- Two orthopaedics operation theatres (one for minor procedure and one for major procedures, 4- Conservative fracture management. 5- Operations. 6- Post-operative management, 7- Giving support in term of anaesthesia to Obs / Gynaecologist 8-General. 9-Surgical (9a- Minor surgical procedure, 9b- Major surgical procedure) 10-Orthopaedics surgery,11-Conservative management, closed reduction and P.O.P. gypsona back slab and complete cast etc.

Out of 380 patients of different age group male were 170 (44.26%) and female 210(55.76%). 362 patients were managed conservatively and surgical procedures done upon 14 (3.68%) and 4 (1.05%) cases referred to major hospital.

**Table 1:** Sex Distribution

Sex	No. of patient	Percentage
Male	170	44.73%
Female	210	55.26%
Total	380	

**Graph 1:**



**Table 2:** Type of Management

Type of Management	No. of Patients	% age
O.R.I.F.	7	1.84%
C.R.I.P.O.P	362	95.26%
Referred Abbott. H.	4	1.05%
Amputation	1	0.26%
Refashioning	4	1.05%
Rotational Flap+E. Fix	1	0.26%
Curettage C.O.M.	1	0.26%
Total	380	

**DISCUSSION**

The economy of Pakistan is the 27th largest in the world in terms of purchasing power parity (PPP), and 44th largest in terms of nominal GDP. However as Pakistan has a population of over 183 million (the world's 7th-largest),(5,6,7)Growth poles of Pakistan's economy are situated along the Indus River; (7)The economy has suffered in the past from decades of internal political disputes, a fast growing population.(8)

But a growing current account deficit – driven by a widening trade gap.(9)

Earthquake activity in Pakistan is mainly concentrated in the north and western sections of the country, along the boundary of the Indian plate and the Iranian and Afghan micro-plates. The Chaman Fault runs along Pakistan's western

frontier with Afghanistan from Kalat, in the northern Makran range, past Quetta and then on to Kabul, Afghanistan. A fault also runs along the Makran coast and is believed to be of the same nature as the West Coast fault along the coast of Maharashtra, India. An active subduction zone exists off the Makran coast. The great 1945 earthquake was centred in this region.(10)

There are four faults in and around Karachi and other parts of deltaic Indus, and Makran coast. The first is the Allah Bund fault that passes through Shahbunder, Jah, Pakistan Steel Mills, and runs through eastern parts of the city and ends near Cape Monz. This fault, in fact, has caused extensive damage in the past many centuries in the deltaic areas. The destruction of Bhanbhor in the 13th century and damage to Shahbunder in 1896 were caused by this fault. The other one emanates from the Rann of Kutchh. The third one is the Pubb fault which ends into Arabian sea near Makran coast and the last one is located in the lower Dadu district near Surajani and falls in the vicinity of Karachi. Tsunamis or tidal waves have also affected the coast of Pakistan. The worst case was in 1945 when an earthquake of magnitude 7.9 struck the Makran coast, waves as high as 12 meters were reported.

More than three decades beloved country is suffering from natural and manmade disasters. On each disaster incidence national organizations were active to handle the situations; respective army always taking more active and major part. International teams from different part of the world also helped. As in mass casualties don't need only treatment and management; also have to face compensations, rehabilitation and reconstruction of demolished structures. (11)

There are 100s of earthquakes taking place on a daily basis all around the world. However ,most of these earthquakes are really low intensity, too low to be noticed. Some times earthquakes are significantly intense.(12) A Global Initiative for preparing civil society to meet emergencies.(13) It's a common quandary after natural disasters displace lots of people and destroy homes and possessions. Relief groups need very specific things, along with cash and organization. Instead, they get vases and vacuum cleaners, or interference from well-intentioned volunteers who think they're helping but are just hindering efforts.(14)

Troops, doctors and aid workers are flowing into Haiti, while nations pledge millions of dollars in

aid. But how do you handle a crisis of this magnitude? Richard Gordon and Mike Evans of the Bournemouth University Disaster Management Centre, outline the planning and potential pitfalls of such an operation. A fundamental principle of disaster management and international assistance is that it is the stricken country's responsibility to take the lead in inviting international assistance, and then co-ordinating that assistance to best effect. UN sends teams tend to deploy for no more than three weeks and then like to hand over once again to the host government. (15) American Red Cross chapters have Disaster Action Teams, which provide disaster relief services on an on-call basis. They may provide free emergency food, clothing and shelter assistance, (16) and assist disaster victims in planning their immediate and long-term recovery from disaster. (17) The teams are composed of American Red Cross Disaster Services volunteers (18) who have received training in disaster assessment, client casework and other skills. (19) Many larger chapters in metropolitan areas have multiple Disaster Action Teams on call at any given time to respond to disasters in their communities.

Disaster Action Teams do not commonly respond to disasters outside their chapter's area of responsibility, which are managed by the American Red Cross's national Disaster Services Human Resources system. (20) People who insist on giving physical goods should make sure they're working through groups that are coordinating with organizations on the ground, McGowan said. Established groups are taking aid to areas that need it. Ad hoc relief groups need to make sure they are taking in only items that are requested and can be distributed. Money is the best because organizations don't have to pay to move it and can tailor spending to changing needs, McGowan said. Transporting and distributing a simple donated can of food can be \$15 to \$25. (21)

James Bucki defined Disaster preparation is the development and documenting of a comprehensive plan that will allow an organization to recover from a catastrophic event. It should include policies and procedures that are appropriate to the size and function of the business. (22)

The Earthquake Country Alliance is the organizer of California's annual earthquake drill. The Shake Out is our chance to practice how to protect ourselves during earthquakes, and to get better prepared. More than 8.6 million people

participated in 2011, and currently more than were registered for 2012. Is your school, workplace, community group, city, or other organization registered? (23)

In 20<sup>th</sup> millennium advance technology revolutionized the life style but think tank still unaware of coming disasters on the global earth. Our disaster relief team experienced the methods applied in the management of disaster victims was quite different as in hospitals.

The principles of fracture management in poly-trauma patients continue to be of crucial importance. Over the last few decades various strategies of fracture treatment in the multiply injured have evolved. (24)

The concept of early total care (ETC) developed in the 80s. Later it became apparent that certain patients did not benefit from ETC. Indeed adverse outcome was encountered. In spite of this, delaying all orthopedic surgery is also, not always the best approach. (25)

In such situations the principle of Damage Control Orthopedics (DCO) may be used. According to Katsoulis et al the DCO principle should be applied for skeletal stabilization in patients of poly trauma, the intent being to allow immediate fracture fixation in patients who are not cleared for definitive fracture care. (26) Trauma Care Toolbox brings together the combined experience and knowledge of the SOMOS membership in the care of the combat wounded as it applies to humanitarian assistance and disaster relief. When faced with a large number of injured civilians in the austere environment of natural disaster and conflict, disaster preparedness training will assist you with providing orthopaedic care when faced with limited resources. (27)

Clifford R brings together the combined experience and knowledge of the Society of Military Orthopaedic Surgeons membership in the care of the combat wounded as it applies to humanitarian assistance and disaster relief. When faced with a large number of injured civilians in the austere environment of natural disaster and conflict, disaster preparedness training will assist you with providing orthopaedic care when faced with limited resources. (28)

Covey documented the difficulties encountered in managing mass casualties. The challenges require the patients to be triaged and treated in an austere and dangerous environment, undergo staged resuscitation and definitive surgery and

endure prolonged evacuation, often involving air and ground transport. (29)

Shabir A Dhar<sup>1\*</sup>, Masood I Bhat<sup>2</sup>, Ajaz Mustafa et al concluded in comparison of experiences Application of damage control orthopaedics in mass disasters in situations where composite trauma centers do not exist appears to be a justifiable modality of management. The advantages it provides are 1. Reduced operating time. 2. Reduced blood loss. 3. Allows easy transport. 4. Conversion osteosynthesis is not impaired if the ring fixators are applied instead of the intramedullary nailing at the suspicion of infection. 5. Mortality is reduced. 6. Complications are minimal except in intraarticular fractures. (30)

All departments must play a role in writing and participating in the plan. Each department will have different requirements Even with planning and practice, most facilities are neither ready nor prepared for a large-scale disaster. Plan for more victims than you think you'll ever have. Plan for how you will track and care for residents. Investigate technology solutions that will help you plan and help you implement the plan in a real emergency. (31)

### Suggestions

Higher Authorities for betterment of population needs to be organize disaster relief teams in every medical non medical institution irrespective of fields, government, non-government like scouts, civil defence and NCC.

The team should consist of 1-Chief organiser Team leader (non medical), 2-Deputy Team Leader (non medical), 3-Liaison Officer, 4-Medical Unit Leader/ Doctor,

5-Medical Doctor/General Surgeon x2, 6-Medical Doctor/Orthopaedics Surgeon x 2, 7-Medical Doctor / Anaesthetist x 1, 8-Medical Doctor / Physician x 1, 9-Medical Doctor/Psychiatrist x1,(2), 10-Medical Doctor/ Juniors x 6, 11-Medical Female Doctor (must be trained Gynae/Obs) x 2, 12-Emergency Nurse x 4, 13-Para medical male staff /sweeper, 14-Para medical male staff/cook, 15-Para medical male staff/plumber cum electrician, 16-Para medical male staff/O.T. Technician x 2, 17-Para medical male staff/ Ward Boy x 2, 18-Para medical male staff/ male nurse x 2, 19-Para medical male staff/camp logistic and 20-P.R.O. / cum Imam sahib.

Necessary goods 1-Water proof tents, 2-Portable tent toilets, 3-Drinking water,4-Water

store container,5-Buckets, 6-Sleeping bags, 7-According to season clothes, 8-Tin pack food, 9-Emergency lights, 10-Local guides & 11-Local security. (32,33,34)

### CONCLUSIONS

Disaster Relief Team doesn't mean a team of medical expertise, staff nurse and paramedical staff because the place where we are going to give medical facilities; that is devoid of all necessities of life for human being. The team should consist of doctors, paramedical staff (O.T. technician, male attendant, staff nurse, sweeper, cook, plumber cum electrician, etc.

Medical and non medical organization should educate and train to staff for such emergency situations just like civil defence, NCC and. scouts. Especially they would be trained of Primary Trauma Care Provider, Basic Life Support and C.P.R.

### REFERENCES

1. Earthquake Reconstruction and Rehabilitation Authority (ERRA), Government of Pakistan . Asian Disaster Management News,January-April 2010 Vol.16, no.1
2. Source: <http://earthquake.usgs.gov/hazards/>
3. <http://disastermgmt.org/type/earthquake.html>
4. Clifford R. Wheelless, III, MD.SOMOS on Wednesday, February 1, 2012.
5. Agricultural Economics: An analysis of industrial-agricultural interactions: a case study in Pakistan". ScienceDirect. Retrieved 2010-07-29.
6. Wikipedia link.rot World Bank Document" (PDF). Retrieved 2010-07-29.
7. www.wikipdia: link rot
8. Declan Walsh (18 May 2013). "Pakistan, Rusting in Its Tracks". The New York Times. Retrieved 19 May 2013. "natural disasters and entrenched insurgencies, abject poverty and feudal kleptocrats, and an economy near meltdown"
9. World Bank Country Classification Groups, (July 2006 data)
10. History of Earthquakes in Pakistan <http://www.dripireland.org/earthquake.php>
11. AF DISASTER RELIEF BY IRISH & PAKISTAN Skrrries Road Balbriggan, Co Dublin. Email:info@dripirland.org Web:www.dripirland.org
12. <http://disastermgmt.org/type/earthquake.html>

13. Earthquake Preparedness, Disaster Information Management System; newsletter : <http://earthquake.usgs.gov/hazards/>
14. [www.disaster necessities.com](http://www.disaster necessities.com) - December 5, 2005
15. Handling a crisis on the scale of Haiti. Richard Gordon and Mike Evans; Bournemouth University Disaster Management Centre <http://news.bbc.co.uk/2/hi/8466595.stm>
16. "Apartment fire displaces four Alorton families" Belleville News-Democrat. Retrieved 2011-10-11
17. "Regional DAT Page". American Red Cross, Los Angeles Region. Retrieved 2011-10-11
18. "Volunteer Opportunities" American Red Cross. Retrieved 2011-10-11
19. "Disaster Action Team Manual"(PDF) American Red Cross, Greater Toledo Chapter. Retrieved 2011-10-11
20. <https://www.facebook.com/pages/Disaster-Services-Human-Resources-System-Of-American-Red-Cross/162551203760384?>
21. MOUNT LAUREL, N.J. (AP) —Associated Press reporter Brett Zongker in Washington contributed to this report Follow Mulvihill at <http://www.twitter.com/geoffmulvihill>
22. From James Bucki, former About.com Guide; ;business disaster recovery ,business continuity ,crisis planning
23. Earthquake Drill in U.S.History. October 18-2012; [www.shakeout.org](http://www.shakeout.org)
24. Hildebrand F, Giannoudis P, Krettek C, Pape HC: Damage Control: Extremities. *Injury* 2004, 35(7):678-689.
25. Roberts CS, Pape HC, Jones AL, Malkani AL, Rodriguez JL, Giannoudis PV: Damage Control Orthopaedics: Evolving concepts in the treatment of patients who have sustained orthopaedic trauma. *Instr Course Lect* 2005, 54:447-62.
26. Pape HC: Immediate fracture fixation – which method? Comments on the John Border memorial lecture, Ottawa 2005.
27. Materials and editorial support for The Disaster Preparedness Toolbox is provided by COL Tad Gerlinger, MD. and Lt Col. Benjamin Kam, MD. Original Text by Clifford R. Wheelless, III, MD.SOMOS , February 11, 2011.
28. Clifford R. Wheelless, III, MD.SOMOS on Wednesday, February 1, 2012
29. Convey DC: Combat Orthopaedics; a view from the trenches. *Jaa Os* 2006, 14():510-517.
30. Shabir A Dhar<sup>1\*</sup>, Masood I Bhat<sup>2</sup>, Ajaz Mustafa et al Damage control orthopaedics' in patients with delayed referral to a tertiary care center: experience from a place where Composite Trauma Centers do not exist.*Journal of Trauma Management & Outcomes* 2008, 1186/1752-2897-2-2
31. Disaster Planning in Long-Term Care By Anthony Cirillo, About.com Guide----- <http://assistedliving.about.com/bio/Anthony-cirillo86455-htm>
32. [www.earthquake.com](http://www.earthquake.com)
33. [www.disaster necessities.com](http://www.disaster necessities.com) - December 5, 2005
34. [www.quakekare.com](http://www.quakekare.com) - December 5, 2005