

DISASTER MANAGEMENT: ROLE OF DENTAL PROFESSIONALS

Ramandeep Singh Gambhir¹, Daljit Kapoor¹, Gurminder Singh¹, Gurjashan Sawhney², Saniya Setia¹

¹ Gian Sagar Dental College and Hospital, Rajpura, Punjab, India

² Sawhney Dental Clinic, Chandigarh, India

Correspondence to: Ramandeep Singh Gambhir (raman1g@yahoo.co.in)

DOI: 10.5455/ijmsph.2013.2.424-429 Received Date: 31.01.2013

Accepted Date: 05.02.2013

ABSTRACT

Natural or manmade catastrophic events place great manpower demands on communities and their health care and public health systems. This calls for ever preparedness on the part of the health care workers. Dentists are not perceived as much of help in case of any disaster event. Although the first responders are primarily looked upon for in case of any disaster response; if called upon dentists can be a source of vital support in medical surge events. Dentists and dental auxiliaries can augment the existing medical professionals, in responding to a declared medical emergency. Dentists are exposed to information in many general medical areas during their pre-doctoral education that can be useful in disaster response situations. Dentists have the clinical skills and medical knowledge that are invaluable assets in a mass casualty event. Dentists can be given the opportunity with additional targeted training to become more effective responders to natural disasters and other catastrophic events. Inculcating disaster training in the undergraduate and post graduate curriculum will better prepare the dentist for any surge event. The present article explores the various duties which dental professionals can play in a major public health disaster.

KEY-WORDS: Bioterrorism; Dentists; Disaster; Response

Introduction

Terrorist attacks and other catastrophic events are likely to create demands that far exceed the capacity of the medical and public health systems to respond. Not only are the numbers of casualties likely to be high, fear and the urgent need for information will complicate the ability to react. Regardless of origin, all disasters reflect unique environments, needs and risks within a given community, jurisdiction and state.^[1] Even as substantial scientific and material progress is made, the loss of lives and property has not decreased. In fact, the human toll and economic losses have mounted. It was in this background that the UN general assembly, in 1989, declared the decade 1990-2000 as the "Decade for Natural Disaster Reduction", with the objective to reduce the loss of lives and restrict socio-economic damage through concerted international action, especially in developing countries. India has been traditionally vulnerable to natural disasters on account of its unique geo-climatic conditions.^[2] Over the past couple of years, the Govt. of India has brought a paradigm shift in approach to disaster management. The approach has been translated into a National Disaster Framework

covering various aspects which have been shared with all state governments and union territory administrations and hence there is a common strategy. The national emergency management authority will be an integral part of Govt. while retaining the flexibility of a field organization with representatives from various departments including department of health.^[3]

In case of disaster events, due its magnitude, the roles of traditional first responders shift. The hospitals and clinics become overwhelmed with the victims.^[4] Even emergency medical service personnel can be rendered compromised due to the damage to the local infrastructure, clinics and hospitals.^[1] Here dentists and dental auxiliaries can play a vital role in disaster response by wide range of skill sets based on personal experience, training and enthusiasm.^[4] Although dentists comprise an important aspect of health team, their role or utility has not been emphasized. Oral health care personnel can be successfully integrated into the emergency medical response system in building needed partnerships, identifying and garnering resources, and facilitating training, policy development, surveillance, and evaluation.^[5]

Dental Professionals and Response

Dentists along with other health professionals can act as first responders and bring well-honed skills to an emergency. Members of the established public health systems and medical community must understand that, in medical surge events, members of dental profession are an additional source of assistance in response activities. Dentists are well prepared to play an important role in response to catastrophic events as they are^[6]:

- experts in barrier techniques and infection control
- trained and skilled in administering drugs by injection
- skilled in placing sutures and controlling bleeding
- able to participate in interdisciplinary professional groups; and
- adept at managing uncomfortable patients

Dental professionals can prove to be helpful during a major public health disaster in the following ways:

1. Supporting other Health Professionals

Private practitioners, local dental societies and interested individuals should make local emergency response planners aware of the services that the dental profession can provide in case of disaster response.^[7] Dentists and their dental auxiliaries can augment the existing medical professionals, in responding to a declared medical emergency. When the local medical resources are unable to cope adequately with huge number of victims, dentist can be recruited to provide certain services that will allow physicians to do things only they can do. Dentists can enhance the surge capacity of the local medical system until additional physicians arrive or demand for immediate care decreases.^[4]

2. Dental Offices acting as Medical Sites

Dental offices are equipped with potentially useful equipment and supplies and should be prepared to serve as decentralized auxiliary hospitals in case the need arises.^[8] Further, dental offices,

equipped with air and suction lines, x-ray equipment and sterilizing capability, can be used as self-contained alternate medical sites if hospitals are under attack or are unsafe because of widespread infection associated with biological weapons.^[9] There is a need to martial all available resources in response to a disaster of great magnitude if losses and disruption of everyday life are to be minimized and recovery facilitated.^[4]

3. Dental Surveillance

Dentists can contribute to bioterrorism surveillance by being alert to clues that might indicate a bioterrorist attack. Bioterrorism attacks and pandemics often have relatively indistinguishable beginnings and ends and unpredictable effects on a population. Such surveillance would note if there is an influx of people seeking medical attention with non-traumatic conditions and flu-like or possibly neurological or paralytic symptoms. A wide distribution of dental offices in nearly every community makes them less vulnerable to complete elimination in a catastrophic disaster. Since dentists are scattered throughout a community they can be a part of effective surveillance network with their eyes and ears open to information on unusual syndromes in the community as well as unusual clinical presentations.^[9]

4. Forensic Assistance

Forensic odontology continues to be a crucial element in nearly all mass disasters whether natural, accidental, or intentional. Some of the diverse facets of this unique discipline can range from the identification of human remains to mass disaster management, from the assessment of bite marks and patterned skin injuries to the use of dental materials in the examination of evidence.^[10] Dental identifications have always played a key role in victim identification during natural and manmade disaster situations and in particular mass casualties normally associated with aviation disasters.^[11] At the onset of disaster, various teams of dentists can be established to start collecting ante mortem data based on the list of missing persons. Once these records have been compiled, forensic odontologists can be begin

comparisons between remains and ante mortem records.^[12]

5. Triage Services

Triage is derived from the French, meaning to sort out, and can be applied to various situations ranging from everyday triage of emergency department patients to large scale disasters.^[13] In the effective response to any mass casualty event, triage must be done to prioritize treatment among casualties as immediate treatment for all casualties is not possible because of inadequate resources in personnel, facilities, and medical supplies. Dentists are able to assist in this important function with relatively little additional training. This assistance allows physicians to provide definitive care for patients most urgently in need rather than screening casualties. Dental offices could serve as triage centers if needed.^[14] A major earth quake struck China on May 12, 2008. Of the 4,582 patients, 408 (8.9%) sustained a total of 482 facial injuries. The dental team participated in triage in the field, in medical patrol service at support sites in many areas including dental offices, and as additional staff members in the hospitals.^[15]

6. Definitive Treatment

Dental professionals along with other health care personnel may be able to provide treatment to the people during any disaster event. Dentists have training and experienced in many areas that may be a part of casualty care in mass casualty events. Oral and maxillofacial (OMS) practitioners are qualified trauma surgeons who can provide first aid, including endotracheal intubation and cardiopulmonary resuscitation, and they are especially experienced in treating dentoalveolar injuries and facial fractures. An OMS team is capable of administering anaesthetic and surgical services to patients with many types of injuries.^[15] For this reason, it is advocated that civilian dentists should be trained along with dental personnel in armed services in augmenting and teaming with their medical counterparts to help provide emergency care to large number of casualties that will be generated in major earthquake or similar disaster.^[16,17]

7. Distribution of Medication

In mass casualty situations, particularly after a bioterrorism attack or the unfolding of a pandemic infection, the population may require medication to treat or prevent the manifestation of the infection being faced. Physicians, nurses, and pharmacist may not be able to effectively prescribe or dispense the medication necessary in the critical, appropriate time required. Dentists can be called on to prescribe and dispense the medications required after the determination has been made by the physician and public health officials managing the disease outbreak. Dentist also can monitor patients for adverse reaction and side effects and refer patients who experience untoward effects from the medications to physicians for treatment, if necessary.^[8,18]

8. Immunization

To limit the spread of infectious agents, whether from a natural pandemic, a deliberate bioterrorism attack, or contamination as a result of a local event, rapid immunization of great numbers of individual may be required in a short amount of time. In major metropolitan areas, where the spread of communicable disease is facilitated, this effort may involve millions of people. Physicians and nurses may be unable to implement such a program in critical time frame required. Dentists can participate in mass immunization programs with minimum of additional training and may be critical factor in the success of urgent programs. Dental offices can be used as immunization sites to minimize the concentration of potentially infected persons.^[13,18]

Role of Medical Reserve Corps (MRC)

Medical Reserve Corps are community based units whose main function is to organize and utilize volunteers who want to donate their time and expertise to promote healthy living throughout the year and to prepare for and respond to emergencies. MRC volunteers include medical and public health professionals such as physicians, nurses, pharmacists, dentists, dental hygienists, veterinarians, and epidemiologists. Other community members, such as interpreters, chaplains, office workers, and legal advisors, can

fill other vital support positions. Most MRC units are coordinated through the Emergency Preparedness Department and coordinate their preparedness efforts with public health officials. The responsibilities of MRC volunteers vary depending on the nature of the needs in the community. MRC volunteers can assist during emergencies as well as non-emergent public initiatives and ongoing community health outreach and education efforts.^[19] The MRC is a definitive and formal opportunity for dental professionals to serve their communities. It is an effective way to use valuable professional skills in an integrated national response.

Essential Crisis Preparedness Action Steps

Association of State and Territorial Dental Directors (ASTDD) 2010 has proposed certain steps of action for essential crisis preparedness. They include Mitigation, Preparedness, Response and Recovery.^[20]

- Mitigation is the first phase of an emergency response plan. Mitigation is used to predict the implications of potential hazards to life and property and to implement actions to reduce or eliminate such risks. It includes long term measures to prevent hazards from developing into disasters altogether or reduce the effect of disasters.^[20,21]
- Preparedness plans help state oral health programs to resume their programs as quickly as possible by delineating essential functions and priorities, preparing a timeline, identifying personnel and resources that will be required and using skills and expertise as a component of public health preparedness response to ensure the provision of emergency dental treatment and disease prevention within the affected communities.^[20]
- The citizens in the area where the event occurs and their local governments and voluntary agencies are the first to have to cope with the event. As disasters always occur at the local level, response starts locally with the immediate community providing emergency assistance. Preparedness planning culminates with a response to a crisis event that

addresses the needs of the community in coping with the event and enhances the recovery process.^[20]

- Recovery occurs in phases as a community rebuilds. During recovery, dental directors should determine the need to sustain all oral health response activities that have been activated and create an appropriate timeline to terminate these temporary operations and transition care back to the community providers.^[20]

Emergency Preparedness-Curricula Proposed for Dental Schools

The current increased threats of terrorism clearly support the need to incorporate terrorism preparedness and response material into the curricula for every health professions school.^[22] A total of seven catastrophe preparedness competencies are identified for dental graduates during the first three years of their course (Table 1).

Table-1: Catastrophe Preparedness Competencies

Competency	Description
1	Describe the potential role of dentists in the first/early response in a range of catastrophic events.
2	Describe the chain of command in the national, state and/or local response to a catastrophic event.
3	Demonstrate the likely role of a dentist in an emergency response and participate in a simulation/drill.
4	Demonstrate the possible role of a dentist in all communications at the level of a response team, the media, the general public, and patient and family.
5	Identify personal limits as a potential responder and sources that are available for referral.
6	Apply problem-solving and flexible thinking to unusual challenges within the dentist's functional ability and evaluate the effectiveness of the actions that are taken.
7	Recognize deviations from the norm, such as unusual cancellation patterns, symptoms of seasonal illnesses that occur out the normal season, and employee absences, that may indicate an emergency and describe appropriate action.

These competencies are based on the recognition that the knowledge and skills possessed by the average dental student upon graduation may be utilized by the public health care system in times

of crisis.^[23] An integrated fourth-year course in catastrophe preparedness can also be developed for dental students. This type of course is already implemented in the dental curricula of New York University as a Senior Level Course.^[24] A program called as the 'National Disaster Life Support' (NDLS) training program can also be developed to better prepare health care professionals and emergency response personnel for mass casualty events.^[25] The program consists of three levels of courses of increasing clinical complexity: 1) Core Disaster Life Support (CDLS), 2) Basic Disaster Life Support (BDLS), and 3) Advanced Disaster Life Support (ADLS). These programs can also be incorporated into the post graduate training curriculum.

Conclusion

In the coming times, the challenges which humankind has to face can be unprecedented. Whether it is a natural disaster or a bioterrorism attack the response of the community to overcome that will be collective using the talents of all the health care workers to the limits. Dentists, forming an important part of the health care community will be looked upon to perform potential service to the society in event of any mishap. There is a need to harvest the services of wide distribution of dentists practicing in our country. Dentists are well versed in the daily practice of infection control, taking and using information from medical histories to guide their actions, taking and interpreting radiographs, administering injections, suturing wounds, managing infections, prescribing medications and making diagnosis on the basis of clinical signs and symptoms. All of these skills apply directly to catastrophe response. Proper training prepares responders to consider various hazards and means to mitigate their effects. Inculcating emergency response to a disaster in the dental undergraduate curriculum and continuing educational programs for practitioners can prepare us well in advance in the wake of any unforeseen circumstance. It is advocated that as dentists are involved in activities such as tobacco cessation, oral cancer screenings, nutritional counselling and a major health care resource for dealing with bioterrorism, the name dentists should be changed to Oral physicians.^[26]

References

1. Colvard MD, Lampiris LN, Cordell GA, James J, Guay A, Lee M et al. The dental emergency responder, expanding the scope of dental practice. *J Am Dent Assoc* 2006;137(4): 468-473.
2. International Strategy for Disaster Reduction (ISDR). 2011. Available from: URL: <http://www.fire.uni-freiburg.de/programmes/un/idndr/idndr.html>
3. National Policy on Disaster Management. 2011. Available from: URL: [www.ndma.gov.in/ndma/guidelinesnational disaster management policy 2009. pdf](http://www.ndma.gov.in/ndma/guidelinesnational%20disaster%20management%20policy%202009.pdf)
4. Guay AH. The role dentists can play in mass casualty and disaster events. *Dent Clin N Am* 2007;51:767-778.
5. Janssen JA, Lampiris LN. Disaster response in Illinois: the role for dentists and dental hygienists. *Dent Clin North Am* 2007;51(4):779-84.
6. Psoter WJ, Triola MM, Morse DE, Rekow EDE. Enhancing medical and public health capabilities during times of crisis. *NY State Dent J* 2003;69:25-7.
7. Flores S, Mills SE, Shackelford L. Dentistry and bioterrorism. *Dent Clin North Am* 2003; 47(4):733-74.
8. Guay AH. Dentistry's response to bioterrorism: a report of a consensus workshop. *J Am Dent Assoc* 2002;133(9):1181-7.
9. Bethesda MD. National Institute of Dental and Craniofacial Research. Dentistry's Role in Responding to Bioterrorism and Other Catastrophic Events. 2011. Available from: URL: http://www.nidcr.nih.gov/careers_andtraining/dentistrycatastrophicevents.htm.
10. Nuzzolese E, Di Vella G. Future projecting concerning mass disaster management: A Forensic Odontology Prospectus. *Int Dent J* 2007;57(4):261-6.
11. Clark DH. An analysis of the value of forensic odontology in ten mass disasters. *Int Dent J* 1994;44:241-50.
12. Naiman M, Larsen AK, Valentin PR. The role of dentists at crime scenes. *Dent Clin N Am* 2007;51:837-56.
13. Tong DC. The role of dentists in a mass casualty situation - A New Zealand perspective. *J Mil Veterans Health* 2008;16(4):20-5.
14. Psoter WJ, Herman NG, More FG, Park P, Robbins M, Rekow ED. Proposed educational objectives for hospital based dentists during catastrophic events and disaster response. *J Dent Edu* 2006; 70(8): 835-843.
15. Wang L, Wei JH, He LS, Cao M, Cao J, Liu YP et al. Dentist's role in treating facial injuries sustained in the 2008 earthquake in China, How Dental professionals can contribute to emergency response. *J Am Dent Assoc* 2009;140(5):543-9
16. Morlang WM. Dentistry's vital role in disaster preparedness. *J Cali Dent Assoc* 1996;24(5):63-6
17. Lennquist S. Education and training in disaster medicine: time for a scientific approach. *Int J Disaster Med* 2003;1(1):9-12.

18. Gallian JM. Dentists can contribute expertise in a major public health disaster. *J Calif Dent Assoc* 2004;32(8):701-8.
19. Glotzer DL, Psoter WJ, Rekow ED, Rinchiuso A, Triola M. The Medical Reserve Corps: an opportunity for dentists to serve. *NY State Dent J* 2006;72(1):60-1.
20. Association of State And Territorial Dental Directors. Sparks: NV 2010. Available from: URL: www.astdd.org.
21. Mosca N. Engaging the dental workforce in disaster mitigation to improve recovery and response. *Dent Clin N Am* 2007;51:871-8.
22. Markenson D, DiMaggio C, Redlener I. Preparing health professions students for terrorism, disaster, and public health emergencies: core competencies. *Acad Med* 2005;80(6):517-26.
23. More FG, Phelan J, Boylan R, Glotzer DL, Psoter W, Robbins M, et al. Predoctoral dental school curriculum for catastrophe preparedness. *J Dent Educ* 2004;68: 851-8.
24. Glotzer DL, More FG, Phelan J, Boylan R, Psoter W, Robbins M, et al. Introducing a senior course on catastrophe preparedness into the dental school curriculum. *J Dent Educ* 2006;70(3):225-30.
25. Coule PL, Horner JA. National disaster life support programs: a platform for multi-disciplinary disaster response. *Dent Clin N Am* 2007;51(4):819-25
26. Giddon DB. Should dentists become 'oral physicians'? Yes, dentists should become 'oral physicians'. *J Am Dent Assoc* 2004;135(4):438-42.

Cite this article as: Gambhir RS, Kapoor D, Singh G, Sawhney GS, Setia S. Disaster Management: Role of Dental Professionals. *Int J Med Sci Public Health* 2013; 2:169-174.

Source of Support: Nil

Conflict of interest: None declared