Disasters and mass causality management in hospitals

(How well are we prepared)

Essay submitted for fulfillment of the

master degree in anesthesia

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List of abbreviations

ALS	Advanced Life Support
APLS	Advanced Pediatric Life Support
ATLS	Advanced Trauma Life Support
BAT	Burns Assessment Team
CAT	Chemical Assessment Team
CHAPS	Chemical Hazards and Poisons Service
CRT	Capillary refill time
CSCATTT	Command Safety Communication Assessment Triage Treatment Transport
CSSU	Central Sterile Services Unit
DH	Department of Health
DM	Disaster Management Program.
ED	Emergency Department
GCS	Glasgow Coma Scale
HAZMAT	Hazardous Material.
HCT	Hospital Coordination Team
HLS	Helicopter landing site
HMIMMS	Hospital major incident medical management and support: the practical approach in hospital
HO	House Officer
HPA	Health Protection Agency

ICRC	International committee of Red Cross.
ITU	Intensive Treatment Unit
JCAHO	Joint Commission of Accreditation of Healthcare Organizations
MC	Medical Commander
MCI	Major Critical Incidence.
MIMMS	Major incident medical Management and Support
MIO	Medical Incident Officer
MLSO	Medical Laboratory Scientific officer
MMT	Mobile Medical Team
MST	Mobile Surgical Team
NHS	National Health Service
NI	Northern Ireland
ODP	Operating Department Practitioner
PAT	Pediatric Assessment Team
PHEC	pre- hospital emergency care
PHPLS	pre- hospital pediatric life support
PHTLS	pre- hospital Trauma Life Support
PICU	pediatric intensive care unit
PneoSTaR	pediatric and neonatal safe transfer and retrieval
PPE	personal protective equipments
P1	Priority I(immediate)

P2	Priority 2 (urgent)
P3	Priority 3 (Delayed)
RR	Respiratory rate
SBP	Systolic blood pressure
SHO	Senior House Officer
SPR	Specialist Registrar
STaR	Safe Transfer and Retrieval
TRTS	Triage revised trauma score
UN	United Nations
UNDMTP	United Nations Disaster Management Training Program.
VIP	Very important person
WRVS	Women's Royal Voluntary Service

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Abstract

The process of disasters and mass causality management in hospital are a very complex process and multifactorial. A major incident is said to have occurred when an incident requires an extraordinary response by the emergency services. While major incidents may affect any of the emergency Services, the health-service's focus is the resulting casualties.

The main principle in major incident management in hospitals is to do the most for the most not the best for each.

Key words:

- Hospital coordination team
- Medical coordinator
- Senior emergency physician
- Senior manager
- Senior nurse
- triage

Summary

The process of disasters and mass causality management in hospital are a very complex process and multifactorial.

A major incident is said to have occurred when an incident requires an extraordinary response by the emergency services. While major incidents may affect any of the emergency Services, the health-service's focus is the resulting casualties. A major incident cannot' however, simply be defined in terms of the number of casualties the resources available at the time of the incident are also relevant.

A structured response to major incidents should be adopted by all members of the Health services involved both within and without the hospital. This approach is encapsulated in seven key principles

1. command
2. assessment
3. safety
4. triage
5. communication
6. treatment
7. transport

The generic nature of these principles has been shown to cross inter-service boundaries, civilian-military boundaries and international boundaries.

A major incident may be considered to have a series of phases.

- Pre-hospital
- Reception
- Definitive care
- Recovery

❖ **Classifying major incidents in hospitals:**

l. Simple or compound

2. Size (Minor/moderate/severe)

3. Compensated/uncompensated

❖ **Hospital major incident response**

(PREPATATION, MANGMENT AND SUPPORT)

1. **PREPARATION:**
    - planning
    - Equipment
    - Training
2. **MANEGMENT:**
    - Collapsible hierarchy
    - clinical hierarchy
    - management hierarchy
    - nursing hierarchy
3. **SUPPORT:**
    - Declare a major incident and activating the plan
    - Reception phase and triage
    - Definitive care phase
    - Recovery phase

CHAPTER 1

OVERVIEW OF DISASTER MANGMENT IN HOSPITALS

The epidemiology and incidence of major incidents:

❖ A major incident is said to have occurred when an incident requires an extraordinary response by the emergency services.

❖ While major incidents may affect any of the emergency Services, the health service's focus is the resulting casualties.

❖ A major incident cannot' however, simply be defined in terms of the number of casualties the resources available at the time of the incident are also relevant.

For example, a road traffic accident in a remote area producing five multiply injured casualties may overwhelm the immediately available local resources. However, a similar incident in a major urban conurbation may require little or no additional resources. Thus, the same incident in different localities may produce a major incident in one but not in the other. (1)

For the purpose of planning, major incidents have been ***defined as:*** events that owing to the number, severity, type, or location of live causalities require special arrangements to be made by the heath services.

This definition is an operational one that recognizes that major incidents occur when the resources available are unable to cope with the workload from the incident. The need to relate major incidents to the availability of resources is most clearly demonstrated when considering incidents that produce specialist types of casualties. An incident producing pediatric, burned or chemically contaminated casualties may require the mobilization of specialist services even when there are only a few casualties. This is because the expertise and resources needed to deal with these types of casualties are limited and widely scattered around any country.

Incidents such as plane crashes may occur in which all casualties are dead at the scene. Whilst these are clearly major incidents for the police and fire service, there is often little Requirement for the health service beyond mortuary and pathology services. An example: of such an incident was the Lockerbie air crash where all passengers were killed and only a few people were injured on the ground. (1)

❖ Classifying major incidents in hospitals:

Whilst the health service definition is an adequate one for planners at a local level, it does not tell us anything about the size of the incidents or the incident's effect on society as a whole. ***Rutherford and De Boer*** have classified and defined major incidents with regard to their size and effect on the health service and society. This classification system is useful for emergency planners and researchers system.

They define major incidents in three ways:

l. Simple or compound

2. Size (Minor/moderate/severe)

3. Compensated/uncompensated

❖ **Simple or compound**:

A simple incident is an incident in which the infrastructure remains intact. Compound incidents are those in which the incident destroys the infrastructure of society itself. Roads, communications and even the health services may be destroyed. Compound incidents typically arise as the result of war or natural disasters.

❖ **Size:**

While it is not possible to decide whether a major incident has occurred purely on the basis of the number of casualties involved, an appreciation of the size of incident can assist in the planning process for a major incident response. ***De Boer et al.*** divide incidents into minor, moderate or severe.

Size	Total number of causalities (alive or dead)	Causalities admitted to hospital
Minor	25 -100	10 – 50
Moderate	100 -1000	50 – 250
Severe	More than 1000	More than 250

Table 1: shows Size classification of major incidents (1)

❖ **Compensated or uncompensated:**

Uncompensated: By definition, major incidents require the additional mobilization of resources in order to deal with the health service workload. Incidents may be considered to be compensated if the additional resources mobilized can cope with the additional workload. When an incident is such that even following the mobilization of additional resources the emergency services are still unable to manage, it is said to be Failure to compensate, That may occur in three circumstances**. First**, the absolute number of casualties may be so large as to overwhelm the available health service resources. **Second,** the resulting casualties may require such specialized (or rare) skills or equipment that any more than a few casualties overwhelm resources. Such incidents may require relatively few casualties to reach this point, as there may be scant resources available to deal with them. **Third**, incidents occurring in remote areas may remain decompensate health as the services may be unable to reach the casualties. (1)

The point at which decomposition occurs is often difficult to define and in many aspects depends on the perspective of the observer. Total failure of the response to a major incident (such as the absence of any medical care) is clearly failure to compensate, and is most likely to occur in natural disasters or war However, failure to compensate may also be considered to have occurred when the care given to individual patients is of a standard less than that acceptable in day-to-day practice. Decomposition is only considered to have occurred when

the system fails to such an extent that individual patient care is seriously compromised. At the present time little is known about the effectiveness of the health service response to major incidents as this information is rarely recorded or analyzed. However, the overall evidence suggests that the care given to individual patients during major incidents is often below the standard that would be delivered in normal daily practice. (1)

The all-hazard, approach and special major incidents:

Major incident planning should follow an **'all-hazard approach'.** This means that one basic major incident plan should be able to cope with all types of major incident. This is necessary as it is impossible for any emergency planner to predict the nature of the next incident. In addition, maintenance of separate major incident plans for all possible eventualities would be impractical. The all-hazard approach also allows planning to be kept as simple and as near to normal working practice as possible. However, despite these guiding principles, there are still certain types of incident that require additional modifications to the basic plan. This is the only way to achieve the aim of optimal clinical management for as many casualties as possible. Incidents involving chemicals, radiation, burns, infectious diseases or a large number of children are considered by many emergency planners as 'special' types of major incidents. Whilst it may be necessary to alter or embellish major incident plans to deal with these specific types of incidents, the required modifications should be made without significant departure from the basic (all-hazard) major incident plan.

All these incidents are characterized by a type of casualty for which resources may be scarce. They may therefore result in a failure to compensate by the health services response even though there are relatively few casualties. Although these types of incident are considered separately, the general principles of emergency planning must still apply. (2)

The epidemiology of major incidents:

Historically major incident planning consequence has been based upon military experience. Consequence of this, many major incident plans have been developed to cope with a number of traumatically injured adults. However major incidents may occur for a variety of reasons and may produce many different types of causalities. Whilst it is impossible to predict the exact nature of the next major incident, there is a little to be gained in planning for types of major incident that might never occur. By looking at the type of major incidents that have occurred in the past planners can base their plans and major incident exercise on realistic scenarios. Unfortunately, accurate data on the nature and incidence of major incidents are difficult to obtain. Little data are collected prospectively and the quality of available data questionable. Despite these limitation some information is available from better major incidents plans can be formulated. Many health care providers perceive major incidents to be extremely rare events. Therefore not surprising that, major incident plan has been accorded a low priority. It is perhaps no surprise that the most active time for major incidents planning appears to be period immediately after an incident has occurred, whish is too late. (3)

How many patients should we plan for?

There appears to be no clear consensus as to how to predict the number of casualties. A variety of estimates for major incident plans have been made previously; some of these have been extremely unrealistic. There are several aspects to consider when estimating the expected patient workload.

First total number of casualties requiring medical attention is important as they will need to be processed and treated by the health services. **Second**, an estimate of the likely number of patients with injuries severe enough to warrant hospital admission, surgery, intensive care or specialist services would be useful. Although the next major incident is unlikely to exactly replicate a