ROLE OF ANESTHETIST IN MASS CASUALTY

An Essay

Submitted for Partial Fulfillment of Master Degree
in Anesthesia

By

Mohamed Ahmed Mohamed Gheith
M.B.B.Ch

Under Supervision of

Prof. Dr. Bahaa El-Din Ewais Hassan
Professor of Anesthesia and Intensive Care
Faculty of Medicine, Ain Shams University

Prof. Dr. Ahmed Nagah El Shaer
Professor of Anesthesia and Intensive Care
Faculty of Medicine, Ain Shams University

Dr. Assem Adel Moharram
Lecturer of Anesthesia and Intensive Care
Faculty of Medicine, Ain Shams University

Faculty of Medicine
Ain Shams University
2014

Acknowledgement

First of all, I wish to express my sincere thanks to Allah for His care and generosity throughout my life.

I would like to express my sincere appreciation and my deep gratitude to Prof. Dr. Bahaa El-Din Ewais Hassan Professor of Anesthesia and Intensive Care, Ain Shams University for his faithful supervision and guidance.

I am also deeply indebted to Prof. Ahmed Nagah El Shaer, Professor of Anesthesia and Intensive Care, Ain Shams University for his great support throughout the whole work.

I would like to express my great thanks to Dr. Assem Adel Moharram, Lecturer of Anesthesia and Intensive Care, Ain Shams University for the tremendous effort he has done in the meticulous revision of this work.

At last, I am indebted for my family

Mohamed Ahmed Mohamed Gheith

List of Contents

List of Tables

Table No.	Title	Page No.

List of Figures

List of Figures (Cont...)

List of Abbreviations

Abb.		Meaning
A&E	:	Accident and Emergency Department
AAGBI	:	Association of Anaesthetists of Great Britain and Ireland
ACLS	:	Advanced Cardiovascular Life Support
AIS	:	Abbreviated Injury Scale
AMP	:	Advanced Medical Post
APLS	:	Advanced Pediatric Life Support
BDU	:	Battle Dress Uniform
CBRN	:	Chemical, Biological, Radiological and Nuclear event
CSCATT	:	Command Safety Communication, Assessment, Triage and Transport sections
CT	:	Computed Tomography
EMS	:	Emergency medical service
EMT	:	Emergency Medical Technicians
FIRESCOPE	:	Firefight Resources of California Organized for Potential Emergencies
GSW	:	Gun Shot Wound
HAZMAT	:	Hazardous materials and items
HCF	:	Health Care Facility
HM Government	:	Her Majesty Government
ICS	:	Incident Command System
ICU	:	Intensive care Unit
ISS	:	Injury Severity Score
JESCC	:	Joint Emergency Services Control Center
LAS	:	London Ambulance Service
LESLP	:	London Emergency Services Liaison
MCI	:	Mass Casualty Incident
MDA	:	Magen David Adminstraion
METTAG	:	Medical Emergency Triage Tags
MIMMS	:	Major Incident Medical Management Support

List of Abbreviations (Cont...)

Abb.		Meaning
NBC	:	Nuclear , Biological , Chemical
NGO	:	Non-Governmental organizations
NHD	:	Nominal Half Day
NHS	:	National Health Service
ORIF	:	Open Reduction and Internal Fixation
PDLS	:	Pediatric Disaster Life Support
RDD	:	Radiological Dispersion Device
RTR	:	Radiological specific TRiage, TReatment, TRansportation
START	:	Simple Triage And Rapid Treatment
START SAVE	:	Simple Triage And Rapid Treatment, Secondary Assessment of Victim Endpoint

INTRODUCTION

Major emergencies, crises and disasters have become more frequent during recent decades, especially in middle and low income countries. They affect more and more people, disrupting health sector programs and essential services, and slowing the process of sustainable human development ***(Dudaryk and Pretto, 2013).***

Anesthesiologists' basic understanding of physiology and pharmacology, their airway skills, their fluid resuscitation expertise, their ability to manage ventilators and to provide anesthesia in the field environment, in the emergency department, in the operating room, and in intensive care units (ICUs) will be invaluable ***(Barash et al., 2013).***

Triage separates out those who need rapid medical care to save life or limb. By separating out the minor injuries, triage reduces the urgent burden on medical facilities and organizations. On average, only 10-15% of disaster casualties are serious enough to require overnight hospitalization ***(Hrdina et al., 2009).***

A number of mass casualty triage systems exist (e.g., SALT, START, SAVE, MASS) and providers should be aware of the structure used in their particular health care system. All triage systems seek to accomplish the same goals: prioritize injuries and apply limited resources to achieve the greatest benefit from surgical or medical intervention ***(Miller and Pardo, 2011).***

Anesthesiologists may well be assigned to provide critical care in scene because of expertise in managing airways, in establishing intravenous access for the administration of medications, and our familiarity with the available anxiolytic and analgesic medications. As emotionally difficult as the process might be of identifying or managing patients not expected to survive is the assessment of patients who may have been injured or been affected during a disaster but do not appear to require treatment, but who might require delayed care ***(Barash et al., 2013).***

Preparation of the hospital starts with an accepting master plan and guidelines for creating local standing orders for this scenario. The hospital should work step by step in adjusting the master plan to its local requirements and infrastructure. During this work, one will find that it is not only technical or logistic but should address medical issues, with pertinent information from clinicians of different specialties. After authorization of the preparedness plan, it should be tested in limited scale drills, and then implemented in the hope that it will never need to be used. Periodic adjustments according to threats and new concepts and equipment should be made ***(Levi and Eran, 2003).***

When responding to an overwhelming volume of severely injured victims, the intensivist must make a paradigm shift away from providing complete care to all patients to one of preferentially administering care to those with the greatest likelihood of survival. To do this effectively, ICU directors must

possess a detailed understanding of the entire disaster response, including organization, triage, staffing, and treatment ***(Mahoney et al., 2008).***

Pain management is a critical part of trauma care. Untreated or inadequately treated pain intensifies the effect of trauma on respiration, hemodynamic stability, and renal and gastrointestinal function, leading to an increase in complications and deaths. It can also cause disabling chronic pain syndromes — the result of changes in the nervous system in response to repeated stimuli ***(Dudaryk and Pretto, 2013).***

AIM OF THE WORK

This study is designed to understand the epidemiology, On spot management, prehospital management, hospital, post operative and ICU management of mass casualty patients according to the current international guidelines.

CHAPTER 1

In order to be familiar with mass casualty and its effects on the health care system, some terminologies should be known.

A) Disaster Terminology

1- "Mass Casualty incident" is an incident in which the number of patients presenting during a given time period exceeds the capacity of the responders to render effective care in a timely manner ***(Sztajnkrycer et al., 2006).***

2- "Time zero" is defined as the time of arrival of the first admitted patient. This time was selected to avoid bias caused by the use of times reported by more than one source ***(Einav et al., 2007).***

3- "Risk" is the probability of the occurrence of a disaster or its consequences. It is the product of the probability of the event multiplied by the seriousness or severity of the event, and thus focuses on the after-effects of disasters ***(Dudaryk and Pretto, 2013).***

4- "Hazard" is a forceful natural or man-made event with the potential to adversely affect human life and property or the environment. Natural hazards are a normal consequence of the internal and external forces that are constantly transforming the earth (ie, earthquakes, hurricanes, tornadoes, volcanoes, and so forth). However, man-made hazards arise from deliberate human

actions or inactions (war. terrorism, humanitarian emergencies, weapons of mass destruction, and so forth) that are usually predictable and entirely preventable. They may also arise from the unforeseen or unexpected consequences of human development and technology (i.e., nuclear or industrial accidents) ***(Dudaryk and Pretto, 2013).***

5- "Disaster" is the result of the adverse interaction between a man-made or natural hazard and the environment, resulting in widespread human or structural damage that exceeds human capacity to respond in a timely and adequate manner. Health or medical disaster refers to the extent of human injury, illness, or death caused by a disaster and the damage sustained by medical facilities, consequently, the needs of surviving injured or ill and of uninjured survivors determines the resources required to provide necessary emergency support functions ***(Dudaryk and Pretto, 2013).***

6- "Emergency support (societal) functions" entail the timely restoration of basic human needs in the form of food and potable water supply, sanitation, transportation, shelter, and emergency health and medical services to the affected population to prevent secondary illness, injury, or death. There exist a qualitative and a quantitative difference between everyday trauma and emergency medical response for the multi-casualty incident and disaster response for the multiple or mass casualty event. Because of these differences planning and preparedness for medical response to a multi-casualty incident does not always translate into effective

disaster planning and preparedness. Moreover, the ideal multiple casualty management response must aim for a seamless and timely escalation of local, regional and national or international resources to meet the needs of casualties ***(Dudaryk and Pretto, 2013).***

7- "Disaster planning and preparedness" is integral to the development and implementation of disaster prevention, preparedness and mitigation programs, and is more effective when based on hazard and vulnerability risk analyses and lessons learned through experience and comprehensive evaluations of disaster exercises, simulations, and actual events. During the past decades, much knowledge has been gained in the fields of comparing and measuring risk, but at the same time more doubt has arisen about the value of this quantification of risk. The perception of risk or the subjective aspects of safety and risk should also be taken into account. In terms of the human and economic costs, the severity, impact, and outcome of a disaster is highly dependent on the pre-disaster socioeconomic level of the community and its prior investment in quality infrastructure (buildings, highways. sewage systems. communication systems, trauma and emergency medical services, and so forth) and planning and prevention programs. Therefore socioeconomic development is an important risk factor that must be incorporated into disaster planning and preparedness (e.g., Haiti 2010) ***(Dudaryk and Pretto 2013).***