INTRODUCTION

Just as art, with which it shares a common background, medicine has evolved from a necessity in the beginning, to a stage of overspecialization concerning even the transplants, deciphering human genome and up to the cloning of the human body.

However, in time, this overspecialization of medicine has started conflicting with social security measures and even with the economic efficiency of the medical act.

In short, from the economic point of view, medicine reached a point where it became prohibitively expensive even for well developed countries.

At this point in time, in the 50s, preventive medicine together with all its disease prevention component parties related to the disease prevention, came back to the attention of decision makers.

Hygiene took the first place. This subject proved without doubt the need to study it as a very important speciality for ensuring health for community, in times of peace. Disaster medicine, as a new field of study which deals with the medical management of crisis situations, has found in the hygiene (“old lady of the medicine”) an ally, thus creating a new concept – DISASTER MEDICINE.

Disaster medicine is the hygiene of crisis situations and hygiene contributes to the prevention of disasters such as illnesses but also natural or man made disasters.

During the past decades, it was developed a new subject of study which deals with the issues of medical management of crisis situations – the new concept is the DISASTER MEDICINE.

The fact that war is the ultimate disaster explains why military medicine has played an important role in the development of Disaster Medicine. On the other hand, correct solving daily emergencies can be seen as a form for medical staff training for intervention in special circumstances, from the collective accidents up to major disasters. In conclusion, it can be said that disaster medicine has its own identity, even if it draws on the attitudes and methods of emergency medicine and the military medicine.

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Keywords: Disaster Medicine, Military Medicine, Emergencies, Medical Emergencies, Hygiene and Public Health, Medical Management of Disasters

Consecutively to the new conditions, a new entity emerged, named (rather pragmatically) “disaster medicine”.

Also, in daily context, it proved that rapid and efficient intervention in medical emergencies (both unique and multiple ones) can save lives and prevent complications. Thus has appeared an equation which united the three concepts:

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\text{DISASTER MEDICINE} \approx \text{MILITARY MEDICINE} \approx \text{EMERGENCY MEDICINE}
\]

The justification of this equation is that the war is one of the biggest disasters, so the relationship between the first two entities is one of approximate equality. On the other hand, daily emergencies can be interpreted as a form for medical staff training for intervention in special circumstances, from collective accidents up to major disasters.

In conclusion, it can be said that disaster medicine has its own identity, even if it draws on the attitudes and methods of emergency medicine and the military medicine.

In order to define the disaster medicine’s action area, we must define first the notions of “crisis/ emergency”, and “disaster”.

Starting from the question “WHAT IS A CRISIS/ EMERGENCY?” or more correctly: “WHAT IS A MEDICAL EMERGENCY?” We will attempt to provide two definitions, which in our opinion are easier to understand but also complete:

“A state of crisis, for a given individual, which disrupts the balance of organs or systems from his body,”

or, from an “action” point of view

“The emergency is an unforeseen combination of circumstances or resulting actions that requires immediate action in response.”
PERCEPTION OF CRISIS / EMERGENCIES

At this stage appears the necessity to determine the vector, required to analyse the state of crisis / emergency or in other words which side of the mirror are we on.

Thus we would talk about an emergency from a patient's point of view, for whom any small pain can be perceived as a real disaster, but also about an emergency from the doctor's point of view.

In addition to these two major aspects of the issue raised by the concept of emergency, there are also other connections which add some aspects particularly to the method of resolving emergency situations which we will consider in later chapters.

The need to study the medical aspects of crisis / emergencies / disasters as a separate speciality

Both in terms of clinical examination, diagnosis and treatment, emergencies are a special category of illnesses or situations to be solved, a particular segment of medicine.

One can easily see the difference drawn by all authors between the chronic impairment of an organ or system and the acute stage of a disease.

A specialist physician must be prepared to deal both with a Single Emergency as well as with a Multiple Emergencies.

If in the above subsection we have dealt with the concept of emergency, we should therefore continue to explain other situations which disaster medicine deals with.

These are the collective accident and the disaster.

Although perhaps it should do so, the Romanian legislation does not clearly provide for the notion of collective accident. Thus the law on emergencies (Title IV of the Law no. 95/2006 on healthcare reform) "The national system of emergency medical care and qualified first aid" defines the notion as follows: collective accident – the event involving a number of victims [how many?], which requires the activation of a special intervention plan requiring additional intervention forces, other than those available on call at that time. The number of victims which requires the activation of a special intervention plan varies from case to case, taking into account the human and material resources available for intervention in the area where the incident occurred.

The legislation of other countries defines this concept as the emergence of large numbers of injured due to the same agent acting in a unit time”.

The threshold number of accident victims for defining a collective accident varies in different legislations from 3 to 15 victims. In our country defining a collective accident is extremely difficult because of unequal conditions of the insurance of medical emergencies.

What is a traffic accident with 10 victims, occurred in a large city?

Such an incident leads to a time of intense work during which the ambulance and emergency hospitals are engaged. The victims’ chances of receiving medical care are real and their sufferings will be resolved promptly.

But what does the same car accident with only three victims on a mountain road in a municipality of a county far less developed mean? The victims’ chances of receiving timely medical care are almost zero and no doubt their sufferings will be amplified, often leading to fatal results.

We propose to call collective accidents any accidents taking place in urban areas and having more than 10 victims and any accidents in rural areas with more than 5 victims, in order to be pragmatic.

Thus we approached the third entity which disaster medicine deals with namely the disaster itself.

The terms used in Romanian, “disaster” and “catastrophe”, are identical in meaning. The only difference between them is how they arrived in the Romanian language. Thus, if the term “disaster”, used in Nordic countries, has been transmitted through the Anglo-Saxon languages, the “catastrophe” has its roots in the family of francophone languages.

In essence their use becomes thus equal and depends only upon the personal preferences of different authors.

But WHAT IS A DISASTER?

There are several definitions, more or less accepted and more or less complete.

We believe that the simplest and most realistic is the following:

Disaster is the negative event following which there is a number of resulting victims in need of a high level medical care which can not be achieved by the structures and organisations directly responsible.

In brief, the three main categories with which disaster medicine deals, can be defined through three equations, as follows:

- the medical emergency (simple): one or more rescuers (R) and one casualty (C) – 1nR >> 1nC;
- the collective accident: a number of rescuers (R) and a number of casualties (C) where C is always greater than R, thus: nR < nC;
- the disaster changes the previous equation. If we define by "nRd" the number of rescuers who will enter the first phase of the action and "nCd" the number of casualties resulting due to the negative event, the equation which characterises the situation of disaster will be: nRd < nCd

In the above equations we used the following abbreviations:

- “n” – the number of participants in the action defined by the equation;
Disaster Medicine is defined as the most appropriate to respond in a consistent and adapted manner to a destructive situation which strikes a social group after a disastrous event. Although it has been recognized as a distinct field of medicine only in recent decades, the concept has spread rapidly throughout the world.

Disaster Medicine constitutes a new approach in dealing with collective emergencies and is part of a mentality and an original medical behaviour, thus making the subject of a separate field for study.

Several criteria can define its field and the manner of action, constituting the features of disaster medicine:

**THE GENERAL FEATURES OF DISASTER MEDICINE**

1. **Field emergency medicine**
   Disaster medicine differs, without opposing it, from the Hospital Medicine, who deals with an influx of victims in a conventional medical structure.

   In contrast to this comfort and safety medicine, disaster medicine offers an effective mode of intervention at the place of the incident or in temporary structures, always mobile, transported or built ad hoc as close to the disaster site as possible. From a medical knowledge point of view, disaster medicine uses the entire science of emergency medicine, and its actions are adapted to the different field conditions. A disaster medicine specialist doctor needs to know all the manoeuvres used in emergency medicine and be able to use them even in spite of improper conditions caused by external factors beyond his/her control, such as insufficient lighting, adverse weather conditions, all kinds of other deficiencies and so on.

2. **Adaptation medicine**
   Being an emergency field medicine, disaster medicine can exist only through a permanent adaptation of:
   - the used techniques, which need to be aligned to the rigors of indications and implementation and the simplicity of the equipment used;
   - the behaviour of teams which must work without the comfort offered by a hospital, without compromising the fundamental principles of delivery a quality medical service.

3. **Global Medicine**
   Disaster Medicine incorporates all aspects of medical aspects: somatic, behavioural and psychological.

   Disaster medicine includes the need for specialists having multiple skills and requires qualifications such as: reanimation anaesthesiologists, multidisciplinary trained surgeons, as well as general practitioners, hygienists, psychologists and psychiatrists, nurses and paramedics, etc.

   Being a global medicine, disaster medicine also becomes a team based medicine, as the different specialties require a multidisciplinary and at the same time complementary approach, hence the need for complete coordination of all the participants during the field actions.

4. **Mass medicine**
   As it needs to deal with a large number of victims, disaster medicine must take into account their diversity as well as the often precarious conditions in which it operates.

   Thus, disaster medicine justifies the use of therapeutic indications based on the lesion severity (selection), and the use of simplification and standardization of the techniques used without sacrificing therapeutic characteristics.

   This mass medicine which deals with a large number of victims which are often in very serious conditions, requires a different work ethic from that of current medical practice, deviating from the traditional way of dealing with one patient at the time in favour of a collective ethics (i.e. sacrificing desperate cases in order to save the largest possible number of victims).

5. **Extra-medical factors dependant medicine**
   Generally speaking, disaster medicine must take into account a large number of mandatory extra-medical factors, such as:
   - the protection against evolving and/or secondary risks;
   - the management and running of transports and communications;
   - the criteria for building temporary structures;
   - the medical supply problem, without forgetting the need to have power sources.

   These factors justify the presence of large numbers of technicians and the integration of disaster medicine into the general rescue plan.

6. **Doctrine medicine**
   Disaster medicine requires a pre-established planning of its operating methods and participants. It therefore requires a single management doctrine, which must respect the balance between medical initiative and the relative rigidity of a plan, and it will take care of all aspects of medical strategy in favour of operational tactics, based on fail proof logistics.
From this point of view, disaster medicine relates to other medical specialties, such as:

a. Military Medicine
First, a war viewed as a civil disaster, involves a large number of victims being killed or injured, thus creating a major disagreement between the immediately available means and the actual needs, given that war is an epidemic of injuries (Pirogov) and resulted in the Health Service Army to develop the following:
- the concepts of lifting the wounded from the battlefield, transporting the injured from the battlefield to the treatment premises, separating the most seriously wounded from those less affected, giving priority and delaying surgical procedures, the equal integration of the concept of evacuation means with the one of means of treatment.
- the rules of field surgery (simple, standardized, which may be achieved in evacuation stages), the organisation of the emergencies evacuation chain, after they have been stabilized, the survival conditions, the secondary evacuations, the use of various types of means of escape (air, land and sea), supplies and reinforcements, hygiene and epidemic prevention.

b. Emergency Medicine
It acts on well defined principles and actions that save lives, allowing the transport in good conditions of a wounded person, who previously received appropriate help, to a surgeon who will perform the surgery with more chances of success.

c. Other forms of medical aid
Such forms are those practiced as part of the specialized services of the army, of the civil defence and of other organizations involved in risk medicine, in a number of circumstances (airports, chemical and nuclear plants, etc.).

d. Other medical specialties
Epidemiology, toxicology, legal medicine and others. Defined in this way disaster medicine will not improvise, it learns, evolves and progresses through the implementation of the acquired knowledge in order to take into account what the doctor finds at the disaster site.

7. Victim diversity
It is well known that the influx of casualties with a wide variety of lesions which is typical of a disaster, which occurs in a brutal way, increases dramatically the needs and exceeds the immediately available means of support.

8. The polymorphism of problems
What a doctor engaged in special operations in response to a disaster needs to deal with, is not only the large numbers of victims but also the their qualitative differences:
- the most frequent type of politraumatism is as following: blast injuries, crush syndrome, gangrenes, as well as burns or frostbites, poisoning, contaminations, drowning or dehydration;
- taking into consideration the secondary victims (pregnant, parturient or aborting) and those who develop heart attack or major heart rhythm disorders;
- taking into consideration the panic that can often be prevented or delayed (in case of seismic movements and other eruptions), which often create specific problems (psychological support);
- finally the problems posed by the dead bodies, which require identification and where “treatment” requires a true specialization.

9. The urgency and scarceness of means
The importance of time is a vital element of disaster. Of course, during the first phase of intervention what strikes is the extreme shortness of time available to the doctor to intervene, to sort and to evacuate.

The shortening of the time available is compounded by the number of victims, by all kinds of difficulties (land, lack of communications, transports, weather conditions etc.) and the constant lack of means of all kinds and their failure to adapt to the existing needs.

Moreover, during a major disaster, there are always complications due to the duration of the intervention, which raises problems for the continuation of the intervention, the personal and collective hygiene, and the replenishment of stocks and the renewal of teams.

10 The numbers of those involved
Dealing with the consequences of a disaster and their management requires a large number of specialties.

The amount of help depends from the beginning on the type of rescue. Medical aid can only occur after rescuing the victims from the places where they were caught by the disaster.

The disaster medicine doctor will need to know and solve transportation problems, clearing works, evacuation, sheltering, political and ethical and ethnic problems, etc.

He will need to integrate himself into the rigor and discipline of a master plan that coordinates the various services. It is imperative that the intervention staff uses a single language and has the same training.

Disaster poses special problems of strategy, plan design, tactical problems, logistics and single doctrine problems.

11. Disaster Medicine - A National Security Component
National security threats to the “HEALTH” factor are not only multiple but very serious. We would like to list those which we consider as the most important, although the order of presentation does not necessarily indicate the degree of importance, so the ranking may be different:
- qualitative and quantitative malnutrition;
- physical and mental decline of population;
- population decline, male population decline, population aging, birth rates decline associated with infant mortality;
- import and export of various diseases.
It results that disasters are unconventional threats to national security, which should involve a lot of interest from the authorities of our country. The medical management of disasters easily becomes a component of Romania's national security system, and the inadequate management or the lack of preparation in this field can be interpreted as serious shortcomings of the decision making factors, which may lead to the erosion of confidence in them and even social movements.

The medical management of disaster is not, but should be, a component of the national security system especially in the context of Romania's status as European country with rights but also with obligations arising out of this.

Pursuant to Law nr.51/1991, Romania's national security is defined as the state of legality, balance and political, social, economic and informational stability necessary for the existence of the state, according to the country's constitutional regime.

In the context of the current legislation, healthcare does not appear to find its place in the context of the national security, which constitutes a false concept due to the fact that human life is a fundamental value whose protection is a duty and an obligation of all responsible national factors. The people represents the main wealth of each country and the Romanian nation, as any other nation in the world, bases its history and future on its individual and collective wellbeing.

Healthcare cannot be provided only by the national health system, it is the prerogative of the entire society and therefore it should be considered an essential component of the national security system.

In the field of healthcare, national security is achieved through the identification, the prevention and the removal of internal or external threats, conventional or unconventional, which may impact upon the national entity, whose main objective is the man.

These threats are often insidious, "silent", developing in time and having a great impact on the future of the Romanian nation.

Healthcare, as a segment of the national security system is not only a goal of any political program or a social protection strategy, but the first goal of maintaining a national entity, which needs to be integrated into the national interest, regardless of socio-political conditions.

The volume and complexity of tasks provided by the legislation for the Ministry of Health, in areas of mobilization training, participation in NATO actions, civil protection, defense against disasters in times of peace or war, terrorist attacks and interference in other crisis situations, requires the Ministry of Health as the national coordinator in the health strategy.

Thus, the Ministry of Health should be a valuable "colleague", which contributes, together with other military or civil structures, to the achievement of the national security functionality, both in the short and especially in the long term.

The main factors which constitute THREATS TO THE NATIONAL SECURITY SYSTEM in terms of health could be:


We believe that the health of the Romanian people must be considered as a factor for stability in the Balkans, because the export of a disease, can always be compared to an attack with chemical or biological weapons.

The current outbreak of "mad cow disease" and "foot and mouth disease" are telling examples of this problem. This may mean not only the lack of security, but is comparable to an export of insecurity.

In conclusion, it can be said that disaster medicine has its own identity, even if it draws on the attitudes and methods of emergency and military medicine. The number and possible variety of suffering victims, the time crisis from the early stages of intervention, the disorder caused by destruction and the poverty of logistical resources, the need to work in close integration with other teams and the need for a good knowledge of the intervention plans as well as the high number of tasks which the doctor must deal with, show that disaster medicine cannot be improvised, but it should be studied, taught, practiced from the early stages of medical training.

We think that the statement that the education of a good doctor is not complete without knowledge in healthcare and general management needs to be revised.

Given that no place on Earth is safe from disasters, adverse events will always subject the people to unimaginable sufferings. The leaders of medical schools cannot fail to seriously consider the need to include the thorough study of DISASTER MEDICINE as one of the newest branches of medicine, which successfully complements the education of a modern doctor. The way the doctor will act in unforeseen circumstances will impact on the life of its patients. In emergency situations the doctor is one step closer to Divinity and the way in which he manages the crisis establishes him as the leader of the community in which it lives.