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REVIEW

Medical and surgical triage

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Summary In terrorist attacks and industrial catastrophes, management of a massive afflux of wounded must adhere to logistic imperatives while at the same time taking into account basic traumatology principles. This implies a firm, unequivocal, and precise doctrine for all stages of care. Medical and surgical triage allows a logical classification of victims according to severity of injury, the necessity of treatment and the degree of urgency. Triage should be early, dynamic, and lead to a categorization that optimally utilizes resources while ensuring efficient management.

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Essential points

- Medical and surgical triage is required only in the case of massive afflux of wounded.
- The categorization used in hospitals must be standardized, universal, and known by all.
- Triage has to be dynamic and evolutive over time.
- It is important to integrate rehearsals of the hospital “white” (disaster) plan in order to train the teams and anticipate any technical or logistical difficulties.

Introduction

The modern concept of management of multiple casualties following an industrial accident or road accident or in case of warfare or terrorist attack dictates that a triage procedure be intimately interwoven with the concept of Damage Control. Notwithstanding, while Damage Control is a therapeutic principle applicable to all stages of management and should lead the wounded as quickly as possible to therapy, triage is essentially a tool that allows caretakers to prioritize the evacuation of patients from the point of trauma to the point of care.

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According to Littré's dictionary, the definition of triage is: « sorting casualties from a large number, after examination and selection ». Sorting therefore means to choose, and optimize the available resources in the interest of the largest number of individuals, or in other words, to define the priority of treatment and evacuation to the point of care. Even if the concept is originally French (Baron Larrey), the term triage, coming from English, is universally admitted.

When and why?

Faced with the problem of managing several casualties at the same time, such as a road accident, pre-hospital management allows the preparation and prioritization of evacuation to the best adapted point of care. Surgical triage is appropriate in case of massive afflux of victims from armed combat or major industrial catastrophes. Reception facilities can easily be overwhelmed; therefore it is necessary to prioritize management according to different parameters while realizing that certain individuals will not receive the optimal treatment.

It is therefore necessary to distinguish between limited affluxes or « multiple casualties » and overwhelming or « massive casualties ». In the first instance, medical structures are usually sufficient. Triage can be summarized as sending the victim to the appropriate care facility without delay. In the second, the idea is to privilege care for the largest number of victims. Surgical triage becomes necessary when there is an imbalance between the number of victims and the therapeutic capacity of receiving facilities.

Where should triage take place?

Triage must begin early and continue along all the phases of management and evacuation chains between the location of the disaster and the appropriate point of definitive care. In the pre-hospital phase, triage optimizes the preparation of patients for transportation, the order of evacuation, and the means of transportation. In the hospital phase, triage consists of defining in what order patients should be sent to the operating room, the need for complementary diagnostic information, and preparation for holding the patient or transfer to other structures. Triage is therefore continuous, evolutive and dynamic. It must be rapid, sure and complete.

Who should triage?

The concept of triage is too often confounded with that of Damage Control, a succession of therapeutic procedures; even though these two notions are intimately related, they are not the same thing. Triage, in itself, is not a therapeutic procedure, but a categorization, a decision-making procedure, at a given point of time, allowing victims to access the necessary care within the best, if not ideal, time interval.

Triage consists of:

- evaluation of the main vital functions and an overall picture of the victim;
- evaluation of the injuries and their evolutive potential of unfavorable degradation.

The surgeon and intensive care physician should work together in synergy. The surgeon should weigh the indications for the intervention required and estimate its duration,

Table 1 ABCDE protocol of the Advanced Trauma Life Support program.

A - Airway with C-spine protection	Freeing and protection of the airway respecting the cervical spine
B - Breathing	Respiration
C - Circulation	Circulation
D - Disability	Neurologic function
E - Exposure, Environment	Undressing, complete examination, prevention of hypothermia

while the intensive care physician should evaluate the response to resuscitation. Working together to treat shock and its cause is the hallmark of teamwork, whose importance increases with the complexity of the mission. If an afflux of multiply wounded patients involves several different teams in the operating suite, the most experienced surgeon should assume the responsibility of the « Surgeon in Charge ». His or her decision must be respected by all [1].

How to triage?

Triage is a dynamic procedure that relies on constant re-evaluation in order to eventually correct an initial error, especially if the victim had been classified as "minimal" with light surveillance. Workup is based on the ABCDE's of ATLS (Advanced Trauma Life Support) (Table 1) and a complete clinical examination.

Several scores exist for evaluation of the severity and prognosis of trauma. They are based on:

- the mechanism of injury (Bombing Specific Triage Tools [2]);
- full injury workup (Injury Severity Score [ISS]);
- clinical scores such as the Glasgow or the Revised Trauma Score (RTS) which are dedicated to pre-hospital management;
- composite scores such as the Trauma Related Injury Severity Score (TRISS), which allows calculation of the probability of survival. This score seems to be the most specific and sensitive in the evaluation of victims all along the chain of management [3].

These scores present limitations in the evaluation of the multiply injured victim because they do not (or only slightly so) take into consideration the evolution of injury over time. Moreover, they do not take into consideration the response to treatment started in the initial management plan. Lastly, they require further information by complementary investigations.

The concept of Focused Assessment with Sonography for Trauma (FAST) dates from 1993. It is based on a rapid sonography that only looks for peritoneal and pericardial fluid and allows hierarchization of the injury workup and categorization of the victim as stable or stabilized. Although rapid and reproducible, FAST cannot be used to establish a definitive diagnosis. This investigation has a high specificity but low sensitivity, and is operator dependent. More than 30% of intra-abdominal lesions are not accompanied by free fluid and therefore are not detected by FAST.

Computerized tomography (CT) is the investigation of choice for multiple injured patients. In the case of massive

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