

Field Trauma Triage in Denmark Combining Patient Characteristics and Injury Mechanism

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Objective: The goal of this study was to develop and validate a field trauma triage system suitable for conditions in which the triage is made not by paramedics, but by ambulance staff who have less medical background. We examined patients' characteristics and injury mechanism in an effort to prevent over- and under-triage.

Design: Prospective, descriptive, interventional study.

Methods: In July 1998, we introduced a Trauma Triage System. During October, November, and December 1998, we reviewed 84 patients treated by the Trauma Team. Due to the results, we introduced a modified Trauma Triage System. In October, November, and December 1999, 61 patients were reviewed. In order to detect under-triage, we reviewed the patients treated at the Neuro- and Trauma Intensive Care Unit to identify trauma patients with ISS >14 not treated by the Trauma Team.

Results: The number of patients was reduced from 84 in the first study period to 61 in the second. Data were available for 82 patients in the first study period and for 59 in the second. In each of the study periods, it was not possible to obtain ISS for 2 patients.

Available data:

	1998	1999
Median ISS	5	9
	Number of patients	
ISS <6	40	24
ISS 6-14	18	16
ISS 15-75	22	17
Total	80	57

Conclusions: The major problem was over-triage. The primary cause was that the injury mechanism alone could activate the Trauma Team. Modification of this process reduced the over-triage and the rate of under-triage remained very low.

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Keywords : ambulance personnel; injury; injury severity score; intensive care; mechanism; paramedics; trauma team; triage

The Göteborg Fire

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On 28 October, 1998, eight teenagers in Göteborg arranged a dance party. The facility the teenagers rented was about 300 m² and was on the second floor of a concrete building located about 3 km outside the centre of the city. There were no smoke or fire detectors in the rooms, which had been allowed to hold a maximum number of 150 occupants. The windows either were closed by crossing iron bars or located 2.2 m above the floor. There were two emergency exits located in either end of the room with a frame width of 90 cm. In order to make more room for the dancers, most of the furniture had been stored on the landing and floor of a staircase leading to one of the emergency exits.

Four teenagers who were denied entrance to the party wanted to break the party up, and started a fire among the stored furniture. The fire built-up heat and uncombusted fumes in the enclosed space of the staircase for about 20 minutes until someone opened the fire-proof door, at which time the superheated fumes entered the dance-hall and ignited. The fire and smoke quickly spread through the ballroom causing panic among the (at least) 387 teenagers present. These were mostly 1st and 2nd generation immigrants from a total of 28 different nations. Sixty-one of these people died within or outside the building.

The first distress call came to the SOS Dispatch Centre at 23:42 hours. The first Fire Battalion alerted was located less than 2 km from the scene, and arrived at 23:49 hours. It soon was followed by police cars, ambulances, and other fire and rescue units. The sight that met the first units to arrive was a furiously burning building with hundreds of people milling around in front of it and people jumping out of the windows from the second floor. Nine firemen in fully protective gear entered the building through the windows and the only available door, abandoning a number of safety precautions. They were able to drag about 60 victims out of the building. Most of them were found in the passageway immediately inside the emergency exit, piled from the floor to the top of the door frame. Many of the firefighters and ambulance crews were in the early phase unable to perform their duties according to plans since lightly injured and friends of the victims were trying to physically force them to take care of their friends first. Some of the personnel were assaulted. When more police officers arrived, the area was sealed off, and a more organised medical care could be given. A garage belonging to a car rental company was opened and used as a casualty clearing station.

Medical treatment was based mostly on the "Load-and-Go" principle, in fact with overloading of the 13 ambulances available. In the early phase, at least six patients were intubated as part of CPR. All of these patients died. A senior ambulance supervisor acting as incident manager, triaged the distribution of the 213

patients to different hospitals. The last of the patients was brought to a hospital at 01:54 hours. Later, the bodies were carried out of the building and were transported to the morgue by ambulances. One detail that was particularly distressing to the rescue personnel, was the fact that many of the victims had mobile phones in their pockets, and these telephones kept ringing with different electronic melodies.

Conclusion: This fire followed a pattern typical for fires in restaurants, discos, etc., characterised by a slow build-up of the fire resulting in huge quantities of toxic fumes. Carbon monoxide poisoning killed most of the dead victims. The fire is detected late, and the evacuation is delayed, since the victims are unfamiliar with the location of the emergency exits, which often become blocked due to panic. In this particular scenario, the situation was even worse due to the fact that the room was overcrowded and the fire started in one of the two available exits.

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Keywords : ambulances; ballroom; carbon-monoxide; fire; fire-fighters; fumes; incident command; intubation; medical care; police; rescue; response; toxic fumes