

problems, and chest pain. In 9,686 (62.1 %) calls, patients were transported to a hospital.

**Conclusion:** This study showed that frequent users constitute a significant proportion of all EMS calls; they may explain the substantial increase seen in EMS call volumes in the last few years. Individually tailored interventions to users with an annual call volume of  $\geq 10$  should be considered.

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### Prehospital Care at a Mass Endurance Event: The Chicago Marathon Experience

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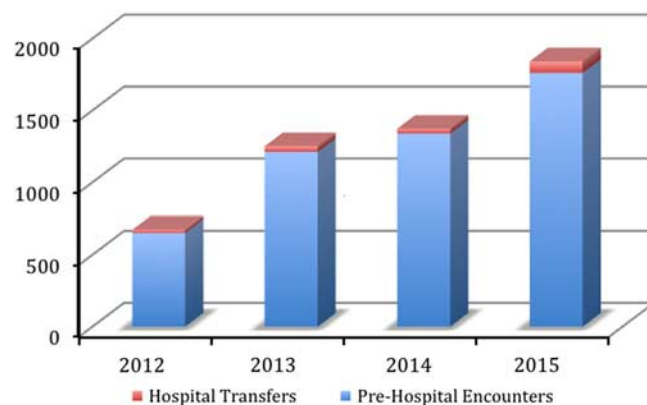
**Study/Objective:** To investigate the impact of prehospital care on patient outcomes and public health systems for the Chicago Marathon from 2012 to 2015.

**Background:** The Bank of America Chicago Marathon is a 26.2 mile race with approximately 40,000 runners annually. One of six World Marathon Majors, it serves as a model for mass event field medicine. The goals of this medical infrastructure are to decrease time to medical attention and transport, triage effectively, decrease hospital burden, and optimize public safety. This study examines impacts of medical structures at the Chicago Marathon, highlighting patient care volumes and trends.

**Methods:** A comprehensive retrospective study was conducted of the Chicago Marathon during 2012–2015. Prehospital medical care involved 21 medical aid stations on course, and two major medical tents in the finish area, including general care and intensive care units. Each facility, staffed with medical personnel, conducted its own triaging. Additionally, each site was equipped with an EMS Superior ambulance for transferring patients to a higher level of care if needed. Medical data was collected via paper and a digital Medical Patient Tracking System designed by Nika Tec.

**Results:** During 2012 to 2015, in total 4,963 people encountered pre-hospital care at the marathon. Of these, 175 people (3.53%) were transferred to a hospital for further care (Figure 1). One-hundred-thirty (2.62%) people were treated in the on-site ICU facilities, suggesting that the triage system imperatively connects patients to appropriate care without overburdening particular personnel and resources.

**Conclusion:** The majority of individuals seeking care were successfully triaged and treated by the personnel and resources on site, addressing the needs of an average of over 1,200 individuals per event. The small fraction transferred to hospitals minimized the public health burden, while identifying and mobilizing those who required transfer. This event can be



**Figure 1.** Number of Medical Encounters at Chicago Marathon 2012–2015.

likened to mass events both planned and unexpected, and it demonstrates strategic pre-hospital medical preparedness.

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### Analysis of Prehospital Scene Times and Interventions on Mortality Outcomes in Victims of Blunt and Penetrating Trauma

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**Study/Objective:** This study was to perform an outcome analysis of patients presenting after blunt (BT) and penetrating (PT) traumatic events.

**Background:** Recent studies have suggested improved outcomes in victims of penetrating trauma, managed with shorter prehospital times and limited interventions.

**Methods:** Descriptive analysis of the 2014 National Emergency Medical Services Information System (NEMSIS) public release research data set for patients presenting after acute traumatic injury.

**Results:** A total of 2,018,141 patient encounters met criteria, of which 3.9% were PT. Prehospital cardiac arrest occurred in 0.5% BT patients, and 4.2% PT patients. 0.8% BT patients and 4.1% PT patients died in the ED. Scene times were 18.1 (IQR 11.0–21.0) minutes for BT and 16.0 (IQR 8.0–17.0) minutes for PT, while transport times were 15.1 (IQR 7.0–19.0) minutes and 14.4 (IQR 6.0–17.0) minutes for BT and PT, respectively. Mean scene time for BT patients who died in the ED was 24.9 (IQR 10.0–24.0) minutes compared with 18.8 (IQR 11.0–22.0) minutes for those admitted; for PT, scene times were 17.9 (IQR 8.0–18.0) and 13.4 (IQR 6.0–17.0) minutes, respectively. Mean number of procedures performed for BT patients who died in the ED was 6.5 (IQR 3.0–9.0) compared with 3.1 (IQR 1.0–4.0) for those who survived until admission; for PT, number of procedures performed were 5.7 (IQR 3.0–7.0) and 2.6 (IQR 1.0–3.0), respectively. 2.2% BT and 14.8% PT patients receiving prehospital venous access died in the ED.

**Conclusion:** Although less common than BT, PT is associated with higher prehospital and ED mortality. Increased scene time and the number of procedures was associated with greater mortality for both BT and PT. Further study is required to better understand any causal relationships between prehospital times, interventions, and patient outcomes.

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### Emergency Care in Cases of Occupational Traumas Among Members of a Vessels Crew, on Sea Transport Ships of Northern Water's Basin

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**Study/Objective:** Sea transport fleet is the main supplier of goods for commercial enterprises and settlements on the Arctic coast of Russia.

**Background:** Extreme conditions of navigation in the northern latitudes lead to the creation of dangerous situations for occupational traumas.

**Methods:** There were 1,367 damages with disability that occurred on vessels of sea transport fleet (208.1 per 1,000 employees).

**Results:** Heightened risk for traumas where the ship's work related to maintenance and repair mechanisms of the engine room (124.4); galley (73.4); maintenance of deck machinery (69.2); handling by the crew (54.8); moving on ladders and decks (44.9); mooring (30.2); machine tools (9.6); and with hatch covers (7.0). Blunt trauma applied in most cases (173.0), sharp (11.0), and thermal agents (11.0). Poisoning by acid, alkali, metal vapor, carbon monoxide, and poisons amounted just 2.4%. Alcohol intoxication among the sailors of the transport fleet was set to 8.9% of occupational traumas on sea transport fleet (18.0). Fractures of the bones of various localization occurs 2.5 times more frequently, and severe bruising almost 2.9 times. Bone fractures are the leading type of damage in the structure, in all the anatomical and functional segments ( $P < .001$ ), including the closure, amounted to 85.5% of cases and open ones - 14.5% ( $P < .001$ ).

**Conclusion:** For occupational traumas on ships, 27.7% of patients (54.1) were surgical procedures designed to stop bleeding from wounds, toilet of antiseptic solutions with elements of surgical treatment, and application of aseptic and plaster casts. More than one-half of the patients (63.6%; 123.7) were treated conservatively, and only 9.7% (17.7) were subjected to surgical intervention. Complications occurred in 15.5% of patients. The average number of disability days was 42.7; bed days 26.4. Recovery occurred in 85.4% (17.5) affected seafarers; they were transferred to light work, followed by vocational rehabilitation 7.5% (15.8), set disability 1.4% (2.8). Mortality was 5.7% (12.0).

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### Perceived Collaboration during Mining Incidents - Focus Group Discussions with Mining Workers and Managers, Rescue Service Personnel, and Ambulance Personnel

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**Study/Objective:** To study perceived collaboration among mining workers and managers, rescue service personnel, and ambulance personnel when mining incidents occur.

**Background:** Studies focused on rescue operations in mining incidents and on the emergency medical service's part in the rescue operations are scarce. In Sweden, usually the local rescue and ambulance services are dispatched to mining incidents. In a Swedish study, it was found that about one-half of the ambulance personnel in mining districts felt unprepared for managing mining incidents, and almost all the personnel desired to learn more about mining incidents.

**Methods:** Six focus group discussions were performed that included mining workers and managers, rescue service personnel, and ambulance personnel that have a mine in their uptake area in the county of Västerbotten, Sweden. Additionally, ten complementary individual interviews with ambulance personnel were undertaken. The interviews were transcribed verbatim and analyzed with qualitative content analysis.

**Results:** The rescue service personnel and the mining personnel perceived their collaboration to be good, but there are still things to consider, eg, being sure that all rescue personnel are willing to enter the mine. During a fire in the Kristineberg mine 2013, several difficulties arose uncovering the need for further collaboration. The ambulance personnel were mostly left out of the collaboration, as most often they waited for the injured to be brought up from the mine. Both the rescue service personnel and ambulance personnel need to rely on the mining personnel when entering the mine, which can lead to difficulties.

**Conclusion:** There is a need to prepare for major injury incidents in a mine, eg, a fire incident with several injured. Therefore, the three organizations need to collaborate more closely, especially the ambulance personnel need to be included more.

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### Early Implementation of BLS, Determining the Effectiveness of Cardiopulmonary Resuscitation

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**Study/Objective:** Correlation between the effectiveness of emergency medical actions taken by ambulance medical staff and early BLS implementation in cases of a sudden cardiac arrest was investigated.