

Patient Assessment and Triage in Emergency Medical Services

The Swedish EMS nurse in a new role

Akademisk avhandling

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av

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Avhandlingen baseras på följande delarbeten:

- I. Magnusson C, Herlitz J, Karlsson T, Axelsson C. **Initial assessment, level of care and outcome among children who were seen by emergency medical services: a prospective observational study.** *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine.* 2018;26(1):88.
- II. Magnusson C, Herlitz J, Karlsson T, Jiménez-Herrera M, Axelsson C. **The performance of the EMS triage (RETTTS-p) and the agreement between the field assessment and final hospital diagnosis: a prospective observational study among children <16 years.** *BMC Pediatrics.* 2019;19(1):500.
- III. Magnusson C, Herlitz J, Axelsson C. **Patient characteristics, triage utilisation, level of care, and outcomes in an unselected adult patient population seen by the emergency medical services: a prospective observational study.** *BMC Emergency Medicine.* 2020;20(1):7.
- IV. Magnusson C, Herlitz J, Axelsson C. **Pre-hospital triage performance and emergency medical services nurse's field assessment in an unselected patient population attended to by the emergency medical services: a prospective observational study.** *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine.* 2020;28(1):81.

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Abstract

Background: Pre-hospital care is highly complex care where the emergency medical services (EMS) nurse assesses patients in an unselected patient population. The increased demand for EMS resources, which also involves a large number of patients with less urgent needs, has led to the introduction of new methods of practice. The EMS nurse has been given responsibility, at the scene, to assess the patient and determine the level of care. To aid the EMS nurse in patient assessment, a triage system, the Rapid Emergency Triage and Treatment System (RETTTS), is utilised.

Aims: 1. To describe the characteristics of the pre-hospital population assessed by the Emergency Medical Services (EMS), 2. To evaluate patient assessment by the EMS nurse and 3. To evaluate the performance of pre-hospital triage with the RETTTS.

Methods: This was a prospective, observational study with a retrospective analysis comprising 651 children < 16 years of age and 6,712 adults that were in contact with the Swedish emergency number and assessed at the scene by an EMS nurse. Data from EMS and hospital records were reviewed manually. To evaluate triage performance, the RETTTS was compared to a pre-defined reference patient including both time-sensitive conditions and vital signs. An instrument for classification was used to compare the EMS nurse field assessment with the final hospital diagnosis. The EMS RETTTS triage in adults was also compared with the National Early Warning Score (NEWS) on several outcomes.

Results: Among all the children, 30% were assessed to remain at the scene. Non-transported patients were younger, often assessed with fever or respiratory distress, whereas transported patients were more frequently associated with trauma or convulsions. Of the transported children, 32% were discharged from the Emergency Department (ED) without any intervention and a total of three per cent were diagnosed with a time-sensitive condition. EMS triage showed under-triage of 33% and over-triage of 33%. The all-cause 30-day mortality rate among children was less than one per cent. The EMS nurse's field assessment was in agreement with the final hospital diagnosis in 80% of cases. In the adult population, the median patient age was 66 years. Twenty per cent remained at the scene. It was more common not to be transported if female, with a history of psychiatric disorders or no history of a previous disease. Ten per cent of the non-transported patients visited the hospital within 72 hours and, of them, ten per cent were diagnosed with a time-sensitive condition. Among all adult patients 11% had a time-sensitive condition. The EMS triage in adults revealed under-triage of 19% and over-triage of 36%. Under-triaged patients were older and more commonly triaged to "uncertain condition". Patients triaged to the lowest levels (green or yellow) had a 79-100% lower risk of death in the first 48 hours. The RETTTS for adults had a greater probability of detecting a time-sensitive condition compared with the NEWS but with lower specificity. Among adult patients with a final hospital diagnosis, the EMS nurse's field assessment was considered appropriate in 82% of cases.

Conclusions: Among children were one third assessed to remain at the scene and among those who were transported to hospital were one third over- and one third under-triaged. In the adult population did one out of five remain at the scene and only one per cent of these patients were later diagnosed with a time-sensitive condition. Among transported adults did eleven per cent have a time-sensitive condition. Over-triage was found in one third and under-triage in one in five patients. Patients with a higher risk of under-triage were older. As compared with NEWS did RETTTS have a higher sensitivity for detection of a time-sensitive condition at the cost of a lower specificity. Among patients with a final diagnosis was the EMS nurse field assessment considered appropriate in about eighty per cent of the cases both among children and adults.

Keywords: Emergency medical services, Triage, Patient assessment, Nurse

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