



## Pre-hospital assessment by a single responder: The Swedish ambulance nurse in a new role: A pilot study



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### ABSTRACT

When a person with vague symptoms calls 112, the dispatchers often have difficulty prioritising the severity of the call. Their only alternative has been to send an ambulance. In Gothenburg, Sweden, a nurse-manned single responder (SR) was initiated to assess this patient group. The study aims to describe patient characteristics and assessment level made by the SR nurse among patients assessed by the dispatcher as low priority and/or vague symptoms. A consecutive journal review was conducted. During six months, 529 patients were assessed; 329 (62%) attended the emergency department (ED) or inpatient care (IC). Of these, 85 patients (26%) were assessed as high priority. Only 108 were assessed as being in need of ambulance transport. ED/IC patients were significantly older. Two hundred (38%) stayed at the scene (SS) ( $n = 142$ ) or were referred to primary care (PC) ( $n = 58$ ). Of the 200 SS/PC patients, 38 (19%) attended the ED within 72 hrs with residual symptoms, 20 of whom were admitted to a ward. Nine patients (4% of 200 SS/PC patients) required inpatient treatment and 11 patients stayed overnight for observation. These results suggest a relatively high level of patient safety and the usefulness of an SR among patients assessed by the dispatcher as low priority.

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## 1. Introduction

The proportion of elderly people in the population is growing, which implies an increasing percentage of patients with chronic illness. Emergency departments (ED) do not have the resources available to meet the demand for health care in the population. Less urgent patients admitted to the ED often have to wait many hours. To deliver more effective health care and also reduce waiting times, other care alternatives have to be examined. They include a fast track where the ambulance nurse, after contact with a consultant, is able to admit less urgent patients directly to wards. This has already been implemented (Gothenburg ambulance service). It can be assumed that some of the patients admitted to the ED may benefit from a

visit to their general practitioner (GP) or from measures taken at the scene in co-operation with home care. This pilot study aims to describe patient characteristics and assessment levels among patients served by a nurse-staffed single responder and assessed by the dispatcher as low priority and/or vague symptoms.

## 2. Background

### 2.1. Ambulance service in Sweden

During the last few decades, the Ambulance Service (AS) in Sweden has undergone quality development from being mainly a transport organisation to become a service with advanced life-saving potential. The competence of the service has also increased to at least one registered nurse in Advanced Life Support (ALS) ambulances (SOSFS, 2001, 1). Nursing outside hospital has become a special field requiring specialisation beyond general awareness. According to the Swedish welfare legislation, this specialisation should enable the nurse to manage care in different, severe conditions.

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Becoming a registered nurse in Sweden requires three years of higher education, ending with a bachelor's degree. A specialised nurse in ambulance care requires one year of nursing experience in somatic care and one year on master's studies in ambulance care. In Sweden, the ambulance fleet is made up of ALS units, and the patients who contact the dispatch centre are assessed by an ALS unit, regardless of symptoms, and transported to the ED, since the assignment is initiated by the patient's decision to seek ED care.

## 2.2. Triage system

To aid the nurse in the process of assessment to identify patients who are in need of immediate medical intervention, a triage and decision system is used. The Rapid Emergency Triage and Treatment System (RETTTS) is a system that is used in the majority of the acute care settings in Sweden (SBU, 2010). The RETTS is based on five levels of priority (Blue, Green, Yellow, Orange and Red). The assessment according to the RETTS is performed in two steps: patient's vital signs and a given algorithm, Emergency Signs and Symptoms (ESS), based on the presenting ailment. Red is regarded as life-threatening, and Orange patients may run the risk of deteriorating. Yellow and Green are classified as a non-life-threatening state and not in need of immediate emergency care. If the patient is triaged to blue level, emergency care does not apply (Widgren and Jourak, 2011). In the pre-hospital RETTS, level blue is not used.

## 2.3. Assessment by emergency dispatcher

The dispatcher assesses the patient's priority level, according to a medical index, into one of four levels of priority, 1–4. Priority 1: life-threatening condition and rapid response; priority 2: urgent response, as soon as an ALS unit becomes available; priority 3: not urgent, response within 90 minutes; and priority 4: transport to/from a health-care facility with a transport vehicle staffed by an ambulance technician (Khorram-Manesh et al., 2011).

The emergency dispatcher has a complex task when it comes to making assessments without visual contact. The process is further complicated when the patient him/herself only makes the calls in 11–13% of the cases (Hjälte et al., 2007b; Neely et al., 2000). The difficulty assessing the patient leads to a safety margin and overtriage is practised (Hjälte et al., 2007b; Khorram-Manesh et al., 2011). According to Khorram-Manesh et al. (2011), there is a discrepancy between dispatcher and ambulance at the scene assessment, and this further implies that a vast number of transport assignments are not necessary and may overload the ED. This indicates the need for a function to assess patients at the scene to the right level of care and estimate the transportation needs. However, knowledge from a Swedish perspective is limited, according to the Pre-hospital Emergency Nurse's (PEN) ability to assess and refer patients to the appropriate level of care.

## 3. Methods

### 3.1. Design

A quantitative exploratory descriptive study based on a consecutive retrospective review of patient notes from 10 June to 30 November 2013.

### 3.2. Gothenburg ambulance service

The ambulance service in Gothenburg operates with 22 ALS ambulances and serves about 600,000 inhabitants in an area of 900 km<sup>2</sup>. In 2013, the ambulances responded to 72,378 assignments. Of these, the distribution by the dispatchers was 29,618 (41%) priority 1,

34,968 (48%) priority 2 and 7,792 (11%) priority 3 cases. In Sweden, priority 1–3 is always assessed by a registered nurse.

### 3.3. The single responder project

In the Gothenburg AS, a project with one Single Responder (SR) was initiated in June 2013. The SR vehicle is equipped like an ALS ambulance, apart from a stretcher and immobilisation equipment but with additional devices for diagnostic tests, such as C-reactive protein and haemoglobin.

#### Single responder dispatch criteria

1. Low priority cases (priority 2 or 3) and an uncertain need for an ambulance or low priority cases with vague symptoms.
2. Priority one assignments only if SR is the nearest unit. Start assessment/treatment until the arrival of the ALS ambulance.

#### Options for SR PEN to assess the level of care

1. The patient is assessed to ED or directly to inpatient care after medical consultation.
2. Referral to primary care with an appointment, the same or the next day.
3. Patient stays at the scene after contacting community nurse/home care.
4. Self-care advice, if the patient decides to stay at the scene.
5. Patient stays at the scene after contacting a mobile psychiatric team or social care.

#### Logistical options for the PEN

1. Acquire ALS ambulance.
2. Seated transport in the SR vehicle.
3. Seated transport – taxi or patient transport ambulance (one technician).
4. Arrange for relatives to transport the patient.

### 3.4. Data collection

All patient notes where the single responder has been allocated during the first six months (June to November 2013) have been included in the present study. The inclusion criteria were the above-mentioned dispatch centre SR allocation criteria. The exclusion criteria were assignments where the SR (1) was allocated to priority one assignments as the nearest unit and the patient was assessed and further treated by the arriving ALS unit, and (2) the SR PEN did not assess the patient at all, for example, handover to the police or in a role as team leader at a motor vehicle accident. The SR files have been collected from the AS data record system (Ambulink) and from paper files (RETTTS). Hospital data were collected from the hospital data records (Melior). During the present data collection process, children (<16 years) were not triaged according to RETTS and are therefore included in non-triaged patients.

### 3.5. Data analysis

The data are presented as number, mean, median and percentage. Fisher's exact test has been used in comparisons of dichotomous variables. When calculating means of populations and testing for significance, a t-test has been used. The level of significance has been set at ( $P = 0.05$ ) 5%.

### 3.6. Ethical considerations

This study has been approved by the AS operating manager and by a pre-hospital senior consultant. Notification to the patient data

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