Notfall Rettungsmed 2015 · 18:107–109
DOI 10.1007/s10049-015-1989-1
Published online: 31. März 2015

V. Lindström[1, 2] · K. Bohm[1, 3] · L. Kurland[1, 4]

[1] Department of Clinical Science and Education, Karolinska Institutet, Stockolm

[2] Academic EMS, Stockholm

[3] SOS Alarm AB, Stockholm

[4] Department of Emergency Medicine, Södersjukhuset, Stockholm

Prehospital care in Sweden

From a transport organization to advanced healthcare

Supplemental Material online:

The translated German full-text version of this article is available at SpringerLink (under supplemental dx.doi.org/10.1007/s10049-015-1989-1)
Zu diesem Beitrag ist eine deutsche Übersetzung verfügbar. Dieses Supplemental finden Sie auf SpringerLink unter: dx.doi.org/10.1007/s10049-015-1989-1

Prehospital care is part of emergency medicine

Emergency medicine (EM), first classified as a specialty in Sweden in 2008 [1], is defined as the continuum of care starting with the patient's first contact with the emergency medical communication centre (EMCC) and including treatment provided by the ambulance services up to the point of definitive in-hospital care. Emergency medicine is evolving as a medical specialty and much remains to be done, both in terms of the organization of the healthcare provided and the development of academic EM. Thus, the current paper focuses on prehospital care in Sweden and its evolution from primarily a transport organization to a system for advanced healthcare, as well as the role of physicians in this system.

Emergency medical communication centres in Sweden (call 112)

Sweden has one telephone number, 112, for all emergency medical communication centres (EMCC), to be called when acute care is required or in the case of an emergency. SOS Alarm AB Sweden, a nationwide government-owned organization, is responsible for this emergency call number. SOS Alarm also plays a central role in disaster response and resource distribution, including collaboration with sea, air and mountain rescue as well as the dispatching of police. Municipalities are responsible for their fire departments, the county councils for ambulance services; both use SOS Alarm for emergency calls. In total, the EMCC receives approximately 3 million calls per year, one third of which are for medical emergencies.

The average response time to a 112 call is not permitted to exceed 8 seconds, as regulated by national standards [2]. The prioritization of ambulance dispatching is based on the symptoms the caller describes and ranges from priority 1 (acute threat to life) to an assignment which does not require supervision or care by medical personnel during transportation. A total of 80% of the population has access to an ambulance within 10 min and 97% are reached within 20 min, while waiting times can be significantly longer in rural areas [3]. To assist in the EMCC dispatcher's assessment and prioritization procedure, the dispatcher uses the Swedish medical emergency index [4]. EMCC dispatchers are nurses and assistant nurses, as well as personnel with other backgrounds. All dispatchers undergo a customized 2-month training program when they first start at the EMCC. The role of physicians in the EMCC varies in different parts of the country and each county decides to what extent a physician should be present. Currently, only one centre has a medical doctor present 24/7.

Future challenges for the EMCC lie in developing systems with which to make decisions and prioritizations with higher sensitivity and specificity, in order to achieve increased patient safety in addition to improved resource utilization. There is an ongoing movement for major organizational changes, directed towards a more centralized organization; the precise structure for the future remains to be determined.

The ambulance service in Sweden

The Swedish ambulance service is regulated by the Swedish National Board of Health and Welfare [5] and has overall approximately 700 ambulances operating in Sweden [6]. The number of ambulance assignments on a national level is not known, but in Stockholm alone, with approximately 2.2 million inhabitants and 62 ambulances, the ambulance service carries out approximately 187,000 ambulance assignments per year. The ambulance service is provided either by the county (i.e. operated by the healthcare authorities) or by private companies contracted by the county council.

Historically, emergency medical technicians (EMT) and firefighters with additional training represented the main groups staffing ambulances [7]. The ambulance service in Sweden has recently developed from an organization focused mainly on transporting the sick or injured to hospital to an organization capable of offering advanced care and medical treatment in addition to transportation to the emergency department [7] or other healthcare facilities. At present, the registered nurse (RN)

is considered the most appropriate professional to work in the ambulance service in Sweden. The presence of RNs in the ambulance services started in 2005, in accordance with the regulations of the Swedish National Board of Health and Welfare [7], which state that every ambulance needs to be staffed by at least one RN [8]. In accordance with this regulation, the RN is permitted to administer drugs and, in the absence of an RN in an ambulance, no drugs can be used to treat acutely ill or injured patients [5, 7]. This was a turning point in the development of advanced care in the prehospital setting. This development is moving towards the requirement for a specialist nurse (an RN with 1 year of additional training in emergency care: a prehospital emergency care nurse) to be present in all ambulances. The additional training is provided at university level and the RN completes a master's thesis as part of this education [9].

The RN, or specialist nurse, represents the highest level of medical competence in the ambulance services; however, he/she does not work alone. At present, an EMT most commonly works with the RN as a member of the ambulance team. Although there are also physicians working in the ambulance services in Sweden, this is predominantly as medical advisors, or as part of special units such as helicopter emergency services (HEMS). Some counties also have physician-staffed rapid response vehicles, such as those in Stockholm, where a physician-staffed rapid response vehicle is available from 7 a.m to 9 p.m. These vehicles are dispatched when a physician is assumed to be of additional value alongside the RN in the ambulance. Typical cases involve children, presumed respiratory emergencies or significant trauma. To date, most of these physicians are anaesthesiologists, but this may change as the development of EM continues and emergency physicians train in the prehospital setting and acquire the necessary knowledge and skills needed for this setting. Moreover, the absence of physicians in the ambulance services may be the result of other professionals, e.g. physicians and EMTs, not being regulated on a national level in the same way as RNs [5].

As in other countries around the world, emergency departments are overcrowded. Consequently, the Swedish ambulance services work to steer patients from the ambulance directly to definitive care, bypassing or fast-tracking through the emergency department. At present, examples of this include geriatric patients being steered to alternative healthcare facilities [8], patients with ST-elevation myocardial infarction (STEMI) being fast-tracked to coronary intervention [11] and patients with suspected hip fractures being transported directly to the radiology department [12].

One of the future challenges of prehospital care in Sweden is the ever increasing demand for ambulance services. This increased demand may be due, in part, to patients with less serious conditions requiring ambulance assistance, but research is needed to explore this group of patients further. There is also a need for improved decision-

Abstract · Zusammenfassung

Notfall Rettungsmed 2015 · 18:107–109 DOI 10.1007/s10049-015-1989-1

V. Lindström · K. Bohm · L. Kurland

Prehospital care in Sweden. From a transport organization to advanced healthcare

Abstract

Background. Prehospital care, starting from the patient's first contact with the emergency medical call centre and including medical care provided in the ambulance, is part of the continuum of care defined as emergency medicine (EM). Sweden has a network of emergency medical call centres that are all reached by one telephone number and staffed by nurses, among other personnel.
Objective. This review presents a summary of the prehospital care systems currently in place in Sweden, the role of the physician and the future challenges in this evolving and important field.
Results and conclusions. Since 2005, the presence of registered nurses in ambulance teams has become a requirement. This proved to be a turning point in the development of advanced care in the prehospital setting in Sweden. Due to overcrowding in emergency departments, the ambulance services work to steer patients from the ambulance directly to definitive care. Although there are limited numbers of physicians in the prehospital setting today, this should change as the specialty of EM grows stronger. The translated German full-text version of this article is also vailable at SpringerLink (under supplemental dx.doi.org/10.1007/s10049-015-1989-1

Keywords
Emergency medicine · Prehospital care · Emergency medical call centre · Nurses · Emergency physicians

Präklinische Versorgung in Schweden. Von einer Transportorganisation zu hochentwickelter medizinischer Versorgung

Zusammenfassung

Hintergrund. Die präklinische Versorgung, die mit dem Erstkontakt des Patienten mit der Leitstelle des Rettungsdienstes beginnt und auch die medizinische Versorgung im Krankenwagen umfasst, ist Teil des Kontinuums medizinischer Versorgung, das als Notfallmedizin bezeichnet wird. In Schweden besteht ein Netz von Leitstellen, die alle über eine Telefonnummer erreichbar und – neben anderem Personal – mit vielen Krankenpflegern besetzt sind.
Ziel. Die vorliegende Übersichtsarbeit enthält eine zusammenfassende Darstellung des derzeit in Schweden bestehenden präklinischen Versorgungssystems, der Rolle des Arztes und zukünftiger Herausforderungen in diesem sich ständig weiterentwickelnden und bedeutenden Bereich.
Schlussfolgerung. Seit 2005 ist die Anwesenheit von examinierten Krankenpflegern eine Voraussetzung bei der Besetzung von Krankenwagen, weil sie Medikamente applizieren können. Das hat sich als Wendepunkt in der Entstehung hochentwickelter präklinischer Versorgung in Schweden herausgestellt. Wegen der Überfüllung der Notaufnahmen versucht der Rettungsdienst, die Patienten vom Krankenwagen aus direkt an die maßgebliche medizinische Versorgung weiterzuleiten. Auch wenn es heute nur eine begrenzte Zahl von Ärzten in der präklinischen Versorgung gibt, sollte sich dies mit zunehmender Bedeutung des Fachgebiets der Notfallmedizin ändern.

Schlüsselwörter
Notfallmedizin · Präklinische Versorgung · Rettungsdienst-Leitstelle · Krankenpfleger · Notärzte

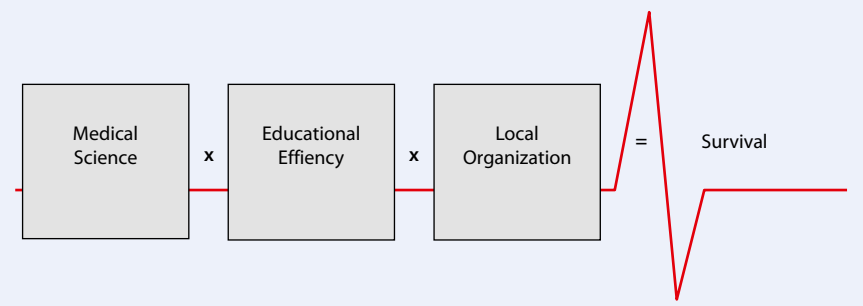

Fig. 1 ▲ The chain of survival, adapted from the Utstein formula of survival (modified from [17])

making tools that enable the RN to direct more patients to the optimal level of healthcare, one of which may be to recommend continued care for patients in their home. To achieve this, a higher degree of academic and medical competence in the field of prehospital care is needed.

Emergency departments as the natural continuation of prehospital care

Much of the focus to date in the development of EM as a specialty has been on developments in the emergency department (ED), from both an organizational perspective and, to an even greater extent, from the perspective of setting up training programs for EM specialists. Nursing specialists are also required in EM and such training programs are emerging. As defined above, EM is a specialty reflecting the continuum of care from the patient's first contact with the emergency medical services to in-hospital care or discharge from the ED. Despite the fact that emergency physicians currently have their main place of work in the ED, it is important that they understand the prehospital setting, the competence required in the field and, with this, its inherent limitations. Although there are limited numbers of physicians in the prehospital setting today, this should change as the specialty of EM grows stronger.

There is considerable potential for the development of emergency services. Common systems for patient administration—which also serve as decision-making support shared throughout the chain of care, starting in the EMCC and following the patient to the hospital—are needed and well within our grasp. Moving hospital care from the hospital ED to the ambulance, e.g. treating severe infections, is also imminent. When guidelines refer to early treatment in severe sepsis [13], we should respond by moving the "time zero" of countdown to treatment from the arrival time to the ED to the arrival time of the ambulance. Although time-critical conditions have spurred the need for and development of EM, much remains to be done in terms of understanding symptom-based presentations. For instance, we know that nonspecific presentations represent an unrecognized high-risk group [14, 15] and that vital signs, the current basis for prioritization [16], are inadequate measures of risk. Hence, we need to develop systems that support medical professionals in identifying and treating patients at risk for poor outcome. The fundamental driving force in the development of EM, including prehospital emergency care, is the need for high quality medical research, educational efficiency and synergistic implementation of the scientific results at local level in order to improve patient outcome (see **Fig. 1**). This needs to be enforced along the entire chain of care in emergency medicine.

Corresponding address

L. Kurland MD PhD
Department of Clinical Science and Education, Karolinska Institutet
Sjukhusbacken 10, Södersjukhuset,
118 83 Stockolm
Sweden
lisa.kurland@ki.se

Compliance with ethical guidelines

Conflict of interest. V. Lindström states that there are no conflicts of interest. K. Bohm receives an unrestricted grant from SOS AB. L. Kurland states that there are no conflicts of interest.

The accompanying manuscript does not include studies on humans or animals.

References

1. National Board of Health and Wefare.("Socialstyrelsen föreskrifter och allmäna råd (SOSFS2008:17) om läkarnas specialiseringstjänstgöring"). http://www.socialstyrelsen.se/sosfs/2008-17 (cited October 15th)
2. http://www.sosalarm.se (cited October 15th 2014)
3. National Board of Health and Welfare ("Socialstyrelsen—Hälso- och sjukvårdsrapport 2009 God vård—Tillgänglig vård i rimlig tid]") (cited December 9th 2014)
4. Leardal: The Leardal Foundation for Acute Medicine; Swedish Index to Emergency Medical Assistance.Stavanger, Norway: Laerdal A/S
5. National Board of Health and Welfare. Regulations from the National Board of Health and Welfare about the Ambulance Service ("Socialstyrelsens föreskrifter om ambulanssjukvård. Socialstyrelsens författningssamling") (2009). Stockholm Sweden
6. SOS Alarm. Information Swedish dispatch organization ("Information SOS Alarm) Stockholm SOS Alarm"); (cited October 15th 2014)
7. Suserud BO (2005) A new profession in the prehospital care field–the ambulance nurse. Nurs Crit Care 10(6):269–271
8. National Board of Health and Welfare. Regulations and general recommendations of medicines in the health care system ("SOSFS2000:1. Socialstyrelsens föreskrifter och allmänna råd om läkemedelshantering i hälso- och sjukvården"). Stockholm, Sweden
9. Karolinska Institutet. Study Programme in Specialist Nursing Prehospital Emergency Care 60 ECTS Stockholm Sweden 2013 (cited October 15th 2014). http://pingpong.ki.se/public/courseId/6376/coursePath/5549/ecp/lang-sv/publicPage.do?item=3900590
10. Vicente V, Svensson L, Wireklint Sundstrom B et al (2014) Randomized controlled trial of a prehospital decision system by emergency medical services to ensure optimal treatment for older adults in Sweden. J Am Geriatr Soc 62(7):1281–1287
11. Bang A, Grip L, Herlitz J et al (2008) Lower mortality after prehospital recognition and treatment followed by fast tracking to coronary care compared with admittance via emergency department in patients with ST-elevation myocardial infarction. Int J Cardiol 129(3):325–332
12. Larsson G, Holgers KM (2011) Fast-track care for patients with suspected hip fracture. Injury 42(11):1257–1261
13. Dellinger RP, Levy MM, Rhodes A et al (2013) Surviving sepsis campaign: international guidelines for management of severe sepsis and septic shock: 2012. Crit Care Med 41:580–637
14. Nemec M et al (2010) Patients presenting to the emergency department with non-specific complaints: the Basel Non-specific Complaints (BANC) study. Acad Emerg Med 17(3):284–292
15. Djärv T, Castrén M, Mårtenson L, Kurland L (2014) Decreased general condition in the emergency department: high in-hospital mortality and a broad range of discharge diagnoses. Eur J Emerg Med (Epub ahead of print)
16. Farrohknia N, Castrén M, Ehrenberg A et al (2011) Emergency department triage scales and their components: a systematic review of the scientific evidence. Scand J Trauma Resusc Emerg Med 19:42
17. http://www.laerdalfoundation.org/studier_hypoteser.html
18. Schuler M, Oster P (2005) Zunehmende Bedeutung der Opioide in der Geriatrie. Schmerz 19:302–307