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Organization of prehospital care in the Netherlands: a perspective article

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The organization and availability of prehospital emergency care has its effect on in-hospital care and crowding in emergency departments (EDs). In this respect, the Dutch system of prehospital emergency care has some unique features we aim to discuss below.

General practitioners

Traditionally, general practitioners (GPs) have always played a major role in the acute care in the Netherlands. A total of >1250 GPs [46/100 000 inhabitants, significantly more than in other European countries, such as France (15/100 000) or Germany (13/100 000)] contribute to the prehospital care system, both during daytime and after hours. Patients can contact primarily their GP for all non-life-threatening medical complaints during daytime. Between 1990 and 2000 GPs united their efforts to improve the availability and quality of primary care after hours as well, and created centralized primary care physician cooperatives (PCP) [1].

These PCP cooperatives gradually started to take over more and more semi-urgent out-of-hours care and contributed to availability of care out-of-hours and significantly alleviated pressure on EDs. More than half of these cooperatives are integrated with hospital EDs and often have direct access to radiology. To meet the educational needs to fulfil the more prominent role in acute care, GP residents follow a dedicated (Schola Medica) training program focussed on the initial assessment and stabilization of the acute patients, following the ABC methods. The prominent role of GPs in the chain of emergency care has resulted in the development of a new Emergency Care subspecialisation for GPs, established by the Dutch College of GPs (NHG), with explicit attention for interdisciplinary cooperation with the rest of the emergency care chain and for the logistics and organization of acute care.

Emergency medical services

The Dutch Emergency Medical Services (EMS) is very well organized. Spread across the country there are 25 regional ambulance services with a total of 241 ambulance

stations and 832 ambulances [2], which guarantees that in >92% of the emergency cases a Dutch ambulance is on the scene within 15 minutes. In 2019 over 1.3 million ambulance rides took place of which 1 020 685 for acute medical problems (A-rides) and 325 370 for planable care (B-rides) [2]. The most common specialties for ambulance transportation are internal medicine (18.0%), cardiology (17.7%), trauma/surgery (15.7%) and neurology (9.9%).

Ambulance crews consist of a specialized nurse/paramedic and an ambulance driver. Ambulance nurses follow a dedicated 18 months training program, and are licensed to administer medical treatment independently at advanced life support level. In their practice, they are aided by a national ambulance protocol (LPA8.1). These protocols have been developed in 1992 and refined ever since. The protocols contribute to safeguarding of quality of care, but also supports the ambulance nurses in their referral decisions [3]. In 2019 a total of 303 822 patients (23% of acute cases) were treated by EMS without further transportation to the ED.

Over the past few years, pressure on the emergency care system and an effort to improve patient-centred care led to differentiation of ambulance care, resulting in the deployment of dedicated ‘medium care ambulances’, ‘psycho-lances’ (for acute psychiatric care) and ‘care ambulances’ (for planable transports). In addition, specialized Physician Assistants and Nurse Practitioners have been introduced to the system, who can attend emergencies solo as ‘Rapid Responders’. With their master’s degree and extra competences they have a professional autonomy comparable to a physician.

Analogous to several other countries, Dutch EMS have implemented telemedicine. Where in the early days, telemedicine was mainly used to forward ECG’s to PCI centres to discuss eligibility of patients, this service is now quickly expanding to more advanced forms of teleconsulting and telemonitoring with access to livestream ECG and livestream vital parameters, and the possibility of direct (video) consultation with a cardiologist on

call [4]. Early (unpublished) data of these interventions shows a reduction in the number of patients transported to EDs as high as 25%, whereas previous studies also demonstrated a positive impact on time to definitive treatment and patient satisfaction [5,6].

Helicopter emergency medical services

For (specific) life-threatening conditions and to assist ambulance crews with procedures outside their scope of practice, Helicopter emergency medical services (HEMS) is available in the Netherlands. Four 24/7 teams are stationed in Amsterdam, Rotterdam, Volkel and Eelde covering most of the country [7]. Dutch HEMS teams (also known as Mobile Medical Teams) are formed by a physician (historically a board-certified anaesthesiologist or trauma surgeon, although this is not specified in the job role as such), a specialized nurse, a helicopter pilot and a rapid response car driver. HEMS crews are trained and experienced in providing specialized emergency care directly at the scene of the incident, and are aided by national HEMS guidelines. HEMS teams provide the full scope of prehospital care, including prehospital emergency anaesthesia, prehospital ultrasound, transfusion of blood products and surgical procedures such as thoracostomies, resuscitative thoracotomy and perimortem caesarean deliveries [8–11]. HEMS is available 24/7 either by helicopter (EC135), or in case of inclement weather, by rapid response car. Launch times are always less than 5 minutes and the average flying time is only 8–13 minutes (depending on which team is activated) [11]. Although the merit of HEMS on outcome is hard to substantiate in general, previous studies report a positive impact on clinical decision making and medical treatment when highly skilled teams attend critical ill the patient on scene early [12].

Lay-person involvement

A final, unique link in the prehospital chain of acute care in the Dutch healthcare system are the citizens themselves. Last year, more than 230 000 lay rescuers were trained to provide BLS and registered with Hartslag.nu, a dispatch system for lay-providers of acute care for patients with an Out-of-Hospital Cardiac Arrest (OHCA). They receive a message on their smartphone when they are in the vicinity of a person in cardiac arrest, and are

informed of the location of the nearest AED. As a result, in 75% of the OHCA's, BLS has commenced- and in 50% an AED is attached before arrival of the first ambulance crew. This likely contributes to the high (almost 25%) survival rate of OHCA in our country [13].

Acknowledgements

Conflicts of interest

There are no conflicts of interest.

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