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The Development and Performance of After-Hours Primary Care in the Netherlands A Narrative Review

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ABSTRACT

In many Western countries, hospital emergency departments are overcrowded, leading to the desire to strengthen primary care, particularly after hours. To achieve this goal, an increasing number of Western nations are reorganizing their after-hours primary care systems into large-scale primary care physician (PCP) cooperatives. This article provides an overview of the organization, performance, and development of PCP cooperatives in the Netherlands. The Dutch after-hours primary care system might offer opportunities for other countries facing problems with after-hours care and inappropriate emergency department visits.

During the past several years, the number of contacts with Dutch PCP cooperatives has increased to 245 contacts per 1000 citizens per year. Many contacts (45%) are nonurgent, and about half occur as part of a series of primary care contacts. Low accessibility and availability of daytime primary care are related to greater use of after-hours primary care. To prevent unnecessary attendance at the cooperatives, physicians advocate copayment, a stricter triage system, and a larger role for telephone doctors. More than half of the PCP cooperatives in the Netherlands have integrated with hospital emergency departments, forming “emergency care access points.” This collaboration has decreased emergency department use by 13% to 22%, and treatment of self-referrals by PCP cooperatives in emergency care access points is safe and cost-effective. Direct access to diagnostic facilities may optimize efficiency even more. Other recent developments include access to electronic health records of daytime

primary care practices, task substitution from physicians to nurses, and the launch of a 2-year training program for PCPs to become experts in emergency care.

INTRODUCTION

In many Western countries, including the United States, discussions are taking place on how to organize accessible, high-quality, and affordable care after regular office hours and avoid unnecessary hospital visits.

The desire for a stronger after-hours primary care system is fueled by the current overcrowding crisis and the rising costs of hospital emergency departments (1, 2). Many European countries have reorganized afterhours care from small groups of physicians into largescale primary care organizations (3). The reasons for this restructuring include reluctance by physicians to commit to being on call 24/7 because of the workload burden, increasing patient demand for after-hours care, and regional shortages of primary care physicians (PCPs) (4 - 6). Important conditions for an after-hours primary care system are accessibility, effectiveness, safety, efficiency, and the satisfaction of both patients and health care professionals. These topics are being studied in many European projects (7).

The primary care system in the Netherlands is strong and might offer an example to other countries facing problems regarding after-hours care, such as emergency department overcrowding (8, 9). In 2011, we published a narrative review of previously published Dutch studies on several aspects of after-hours care, including experiences of both health care professionals and patients, patient safety, adherence to practice guidelines, waiting times, and telephone triage (10). In the past 5 years, important changes have been implemented in Dutch after-hours care in response to new challenges. Therefore, we revisited and updated our previous review.

ORGANIZATION OF AFTER-HOURS CARE IN THE NETHERLANDS

The Dutch health care system is designed to provide equal access for all citizens. Health care insurance is offered in a regulated market; the basic insurance package is comprehensive and includes free access to primary care. All Dutch citizens are registered with a PCP, who generally is consulted first for any health problem. Primary care physicians act as gatekeepers: they handle more than 90% of medical problems presented, and a referral is needed for visits to medical specialists in hospitals (Table 1) (8, 9, 11, 12).

After-hours primary care is provided by 119 largescale PCP cooperatives, each of which has 50 to 250 physicians who provide care to 100 000 to 500 000 citizens (5, 10, 13). The cooperatives serve 99% of the Dutch population of 17 million and are available daily from 5 p.m. to 8 a.m. on weekdays and all hours on weekends (13). Unlike urgent care centers in many Western countries, PCP cooperatives have a nationally uniform model, are open after hours, use telephone triage, always have physicians on site, and are set up and controlled by the physicians, who are members of the cooperative.

Patients who have an urgent health problem after hours may contact a PCP cooperative, call the emergency number (112), or visit the hospital emergency department. Patients have access to a cooperative through a regional telephone

number. Telephone triage nurses assess the urgency of a patient's health problem and determine the appropriate action to be taken. The nurse may give the patient self-care advice over the phone, invite the patient to visit a physician at the cooperative, arrange a physician home visit, or call for an ambulance. All Dutch cooperatives use the same computer-based decision-support triage system—the Netherlands Triage Standard—to support these nurses (Table 2) (14, 15). This system also is used by about half of the ambulance call centers and an increasing number of emergency departments. Primary care physicians supervise the triage nurses; they may be consulted in case of doubt, and they check and authorize all calls. With regard to home visits, physicians use fully equipped cars, and medically trained drivers provide transportation and assistance (10). Most health problems are taken care of by the PCPs; about 6% of all patients presenting to the cooperatives are referred to an emergency department (16).

In earlier years, concerns were expressed regarding patient safety at the cooperatives because of the high patient throughput, use of nurses for telephone triage, and risk for errors caused by potential discontinuity in information (17). However, a retrospective medical record study in the Netherlands showed patient safety to be high (18). Moreover, cooperative physicians use the same national physician association guidelines that they use during their daytime work, and adherence rates are high (19). Finally, both patients and professionals reported being satisfied with the after-hours primary care system (20, 21).

PERFORMANCE

Use of PCP Cooperatives

The number of contacts with PCP cooperatives has been increasing since 2005 (Figure). In 2015, 245 in 1000 citizens contacted a cooperative. About 40% of contacts are telephone consultations, 50% clinic consultations, and 10% home visits (13).

The after-hours cooperatives are meant to address urgent help requests that cannot wait until the next day.

However, in practice, a large portion (45%) of these requests have been considered nonurgent from a medical perspective (13). We examined the reasons patients sought after-hours primary care by looking at cases classified as nonurgent in 4 cooperatives from 2009 to 2012. The most frequently mentioned motives were worry (42%), the need to see a physician (34%), and a desire for medical information (26%) (22).

In 2012, we surveyed Dutch physicians regarding strategies to influence after-hours primary health care use. Almost all the physicians felt that the number of patient contacts could be reduced. Measures they believed to be both desirable and effective included patient copayments, stricter triage, and a larger role for telephone consultation physicians (23).

Usage rates vary among PCP cooperatives. A 2011 study of 21 cooperatives found that sociodemographic characteristics explained much of the variation in health care use among cooperatives. Demand was statistically significantly higher in neighborhoods with more women, low-income households, and non-Western immigrants; a greater degree of urbanization; and lower socioeconomic status (24).

Usage also varies among primary care practices within a cooperative. In 2011 to 2012, we studied the variation in after-hours health care use among patient

populations from 100 daytime primary care practices at 5 cooperatives. Aside from patient population characteristics (for example, young children or foreigners), organizational characteristics of primary care practices, such as longer telephone waiting times or less availability of PCPs to their patients in the palliative disease stage, were associated with greater use of after-hours cooperatives (25).

Triage

In the first years after the PCP cooperatives were launched, the focus was on the safety of the telephone triage system (17). More recently, this system has become professionalized with mandatory training for triage nurses and the use of a national computer-based triage system.

In a study using data from 29 cooperatives from 2008 to 2010, we found that the quality of the triage conversation is associated with the appropriateness of the triage decision (26). Therefore, monitoring the quality of calls and providing continuous education and feedback are important. We developed and validated an observational instrument called KERNset to assess the quality of telephone triage (27). KERNset comprises a minimum of 22 items that may be used by trained raters to retrospectively measure the quality of audiorecorded triage calls. It was implemented nationally in 2016.

Currently, physicians' main concern is triage inefficiency: Too many patients with less-urgent health problems are being allocated to face-to-face contacts at PCP cooperatives (23). This issue has arisen because of the increase in patients contacting cooperatives and the high workload of physicians. However, in studies of 2 cooperatives in 2013 and 2015 that examined differences in urgency assessments among triage nurses (during telephone consultation) and PCPs (after consultation), we found that most face-to-face contacts (68% to 79%) were medically necessary. Of the medically unnecessary ones, 16% to 22% were understandable from the patients' perspective (for example, because of worry or pain), and only 5% to 11% were redundant. Of all medically unnecessary face-to-face contacts, 63% to 69% could have been avoided by a telephone consultation with a PCP (28, 29).

Finally, a 2012 study of 17 cooperatives found a statistically significant variation in urgency levels among the cooperatives, even for the same health problem.

This variation was associated mainly with differences in patient characteristics (such as sex and age) that likely reflect patients' clinical needs. It was not associated with use of the triage system (30).

Follow-up Contacts

We examined whether patients who had contacted a cooperative had subsequent encounters related to their initial health problem. In a study using data from 2003 to 2009 from 59 cooperatives, more than half (52%) of the patients had a follow-up encounter with a daytime primary care practice or another contact with the after-hours cooperative (31). An analogous study using data from 2009 to 2011 from 16 cooperatives, including follow-up contacts with other health care services, found a similar result: 47% of the patients had a follow-up contact, usually with their primary care practice (32).

The probability of follow-up contact was greater in patients who were older (aged \geq 65 years) (31, 32), had been visited at home (31, 32), or had received care from a cooperative with a higher percentage of telephone consultations (32). It was lower among patients with more positive experiences (32). Access to a daytime primary

care practice before contact with a cooperative also was a strong predictor of follow-up communication (31). We conclude, therefore, that many patient contacts with PCP cooperatives are part of a disease episode including several primary care contacts.

[TABLE 1] [TABLE 2]

NEW DEVELOPMENTS

Collaboration With Emergency Departments

During the past few years, the most prominent change in after-hours care in the Netherlands has been the increasing proportion of PCP cooperatives that collaborate with and are located within hospital emergency departments (56% in 2015) (13). At these shared sites, known as emergency care access points, PCPs generally are responsible for the triage and treatment of self-referrals (walk-in patients), who otherwise would present to the emergency department after hours.

Of all emergency department contacts, 17% are selfreferrals (33).

We evaluated this type of organization at 3 emergency care access points by using data from 2011 to 2012. Self-referral cases mostly were trauma related, were of low urgency, and occurred in male patients.

[FIGURE 1]

After consultation with a PCP, 24% of these patients were referred to the emergency department, mostly for radiodiagnostics (53%). Thirty percent had a follow-up contact, mostly with the daytime primary care practice and rarely with the emergency department (34).

We also conducted a before-and-after study at 1 location, comparing data from 2006 to 2008 (before the site became an emergency care access point) with those from 2009 to 2011 (when it was an emergency care access point). The reorganization resulted in a 13% decrease in overall emergency department use, the near absence of self-referring patients at the emergency department after hours, and a greater probability of hospital admission and clinical follow-up (35). A study in 2011 (36) and another in 2013 (37) compared 3 emergency departments that were part of an emergency care access point with 3 that were not. The 2011 study found a 22% decrease in overall emergency department use (36). The 2013 study found that patients at emergency care access points were older and more likely to be referred to the emergency department and hospitalized (37).

We conclude that treatment of self-referrals by PCP cooperatives at emergency care access points is a safe and cost-effective alternative to providing care at emergency departments and that increased collaboration between after-hours primary and emergency care providers seems to optimize the use of emergency departments, which might help alleviate their overcrowding.

Access to Electronic Health Records

During the past few years, the number of Dutch PCP cooperatives with access to electronic health records of daytime primary care practices has increased rapidly. A patient's health records may be examined only with his or her permission, and about 50% of Dutch patients have given their consent. Health record accessibility contributes to continuity of care and safety and helps prevent unnecessary actions

(8). Electronic exchange of information is important because many patient contacts at cooperatives are part of a series of primary care contacts, as mentioned earlier. The electronic health record, if accessible, is examined during telephone triage for information regarding medical and physical history, diagnostic results, medications, and individual work plans.

Access to Diagnostic Facilities

One way to increase the efficiency of PCP cooperatives is through direct access to hospital diagnostic facilities, such as radiologic imaging, which currently is limited although increasing (38). This might reduce the number of patients referred to hospitals; as mentioned earlier, the reason that 53% of self-referred patients are sent to the emergency department by PCP cooperatives is to obtain radiodiagnosis to rule out fractures in case of musculoskeletal trauma (34). We currently are investigating the effects of direct access to radiology on patient outcomes. Access to other diagnostic facilities, such as ultrasonography and point-of-care testing, might further optimize care at PCP cooperatives.

Task Substitution by Nurses

Another development in Dutch PCP cooperatives is task substitution from physicians to specialized nurses.

Positive outcomes from this approach are reported in the literature, both in daytime general practices and at after-hours cooperatives, in terms of physician workload, patient experiences, and care outcomes (39). A quasi-experimental study at 1 cooperative in 2011 to 2012 showed that nurses can adequately handle 77% of all consultations within the center (40). Currently, we are examining the effects of home visits by specialized nurses.

Training Program

Because of the developments and rapid changes in emergency care, the need arose to have PCP experts in this field. In collaboration with the Dutch PCP association, 2 university medical centers developed a 2-year training program for physicians to improve their emergency care knowledge and skills. Graduates of the course are motivated to play a role in designing research, developing guidelines, strengthening collaboration with many partners, or managing cooperatives, or to become trainers themselves. The first 17 candidates are expected to graduate in 2017.

DISCUSSION

In the 15 years since the after-hours PCP cooperatives were launched in the Netherlands, the system has improved. The most prominent change in the past 5 years has been the integration of more than half of the cooperatives with hospital emergency departments, forming emergency care access points, each of which provides an entry point for patients. After triage, patients usually are sent to a PCP or to a specialist in the emergency department. This process has resulted in a statistically significant decrease in emergency department use.

Treatment of self-referred patients by PCPs in emergency care access points is a safe and costeffective alternative to emergency department care.

Because direct access to diagnostic facilities may further improve efficiency, this approach is being evaluated in a multicenter study.

During the past several years, the number of patients contacting PCP cooperatives has increased, and a large percentage of these requests for medical help are

nonurgent. Physicians have criticized the triage system for being inefficient and resulting in too many clinic consultations, and they advocate for a larger role for “telephone doctors” to support triage nurses. Improving the accessibility and availability of daytime primary care, moreover, might be an effective way to make the use of after-hours care more appropriate and efficient.

The Dutch model of PCP cooperatives, especially in the form of emergency care access points, may provide opportunities for other countries considering remodeling their system of after-hours care. Nations wishing to transform their current after-hours primary care system to set up PCP cooperatives must consider the wider health care system and may have to meet additional requirements, including primary care investments (41).

In the Netherlands, a future challenge will be to alleviate the after-hours workload by redirecting patient flow to daytime primary care practices and to reduce avoidable hospital admissions.

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TABLES AND FIGURE

Table 1. Features of the Health Care System and PCP Cooperatives in the Netherlands, by Theme*

Health care system

All citizens have the right to health care.
Health care insurance is compulsory, but persons may choose any insurer.
The basic health care insurance package is almost comprehensive, and the government defines its contents.
The basic insurance package includes primary care, inpatient and outpatient hospital care, and selected drugs. Insurers offer various types of complementary voluntary health insurance that cover dental and allied health care (such as physiotherapy).
For most health care use, a deductible (the equivalent of US \$410 in 2017) is compulsory; exceptions are primary, obstetric, and maternity care and dental care for children.
Children aged <18 y are insured free of charge.
All citizens are registered with a PCP who is accessible without financial barrier and is included in the basic insurance package and excluded from the deductible.
PCPs are remunerated according to a system consisting of a capitation fee per registered patient, a consultation fee, a contribution for activities that increase efficiency or substitute for secondary care (fee for service), and compensation for providing after-hours care.
The Netherlands spent the equivalent of US \$5601 per capita on health in 2013. Health expenditure has increased since 2000, but in recent years the increase has slowed considerably. Health expenditure as a share of gross domestic product (12.9%) is the highest in the European Union, mainly because of the long-term care sector. For hospital care and ambulatory care, the expenditure is about average.
Between 1980 and 2013, life expectancy has increased from 75.7 to 81.0 y. Despite this increase, the Netherlands has moved from a top ranking on this indicator to a more intermediate position among European countries.
Compared with other countries, the Netherlands has low antibiotic use, a low number of avoidable hospitalizations, and relatively low avoidable mortality.

Organization

Since 2000, large-scale PCP cooperatives have provided after-hours primary care in the Netherlands.
There are approximately 120 PCP cooperatives.
After-hours is defined as between 5:00 p.m. and 8:00 a.m. on weekdays and all hours on weekends and holidays.
Each PCP cooperative serves 100 000-500 000 patients, with an average care consumption of 250 per 1000 inhabitants annually.
50-250 PCPs participate in a cooperative, with a mean of 4 h on call per week.
A shift takes 6-8 h, with an hourly salary approximately equivalent to US \$69.
Per shift, PCPs have different roles: supervising telephone triage, doing center consultations, or making home visits.

Location

PCP cooperatives are usually situated in or near a hospital's emergency department. 17% of patients at emergency departments are self-referrals.
No patient is more than 30 km (18.6 mi) away from a PCP.

Accessibility

Access is through a single regional telephone number.
Nurses supervised by PCPs provide telephone triage; contacts are divided into telephone advice (by triage nurse or physician), PCP clinic consultation, or PCP home visit.
Some PCP cooperatives use a central call center for telephone triage.

Facilities

Home visits are supported by trained drivers in identifiable, fully equipped cars (e.g., with oxygen, intravenous drip equipment, automated external defibrillator, and medication for acute treatment).
Information and communication technology support includes electronic patient records, online connections with PCP cars, and connections with electronic health records in primary care daytime practices.

PCP = primary care physician.

* References 8 and 10-12.

Table 2. Urgency Categories of the Netherlands Triage Standard*

| Urgency Level | Urgency Category | Description | Response Time |
|---------------|------------------|--------------------------------|---------------------|
| U0 | Resuscitation | Failure of vital functions | Immediate |
| U1 | Life-threatening | Vital functions are unstable | As soon as possible |
| U2 | Emergent | Vital functions are threatened | Within 1 h |
| U3 | Urgent | Risk for damage | Within a few hours |
| U4 | Nonurgent | Negligible risk for damage | Within 24 h |
| U5 | Advice | No risk for damage | Next working day |

* Reference 14.

Figure. Number of contacts per 1000 citizens, by contact type.

