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Access to Emergency Healthcare

Abdulnasir F.H. Al Jazairi and Guillaume Alinier

Abstract

Access to emergency services is essential for the health and well-being of people. The World Health Organization (WHO) made it a human right for everybody to have access to emergency care and it is an ethical obligation for governments to provide this service for the whole population. In recent years, the overcrowding in emergency departments has become a prominent issue that needs proper solutions. There have been several attempts resolving this ongoing issue. One of those is the patients' distribution according to the severity level of their chief complaint, since more than half of the urgent cases are of low acuity and can be managed in less equipped facilities. Primary healthcare centers are perfectly suited to look after a significant proportion of cases for many reasons such as their scope of service, their wider geographical distribution, and are a more cost-effective resource for such cases than the use of higher acuity facilities. In Qatar, we have been implementing such model of patient distribution to release the burden on emergency departments since 1999. In this chapter we are proposing a full protocol to distribute emergency patients involving the ambulance service, primary healthcare centers, and emergency departments. Cooperation of all these services with the help of higher authorities and media is expected to show great improvements in patient care and better crowd control in emergency departments.

Keywords: healthcare access, emergency care, urgent care, ambulance service, triage

1. Introduction

The World Health Organization (WHO) made it a human right for everybody to have access to emergency care and it is an ethical obligation for governments to provide this service for the whole population [1]. It is an instinct for human beings to search better living place for themselves and family. There are several criteria to consider regarding the suitability of a place or city to live in. One important indicator is quality of life in general and an essential part of it is accessibility to high quality healthcare services. Part of quality assessment of healthcare in modern medicine is the time factor and easy access to healthcare services especially in emergency situations, such as serious traumatic injuries, myocardial infarction, stroke, infection ...etc. Putting such system in place relies on an infrastructure which encompasses the provision to the general public of an emergency services contact number managed by a call center. The emergency medical dispatchers answering the calls should ideally have oversight of the status and location of the response vehicles around the caller so they can send the required help in the shortest amount of time as possible [2]. The expectation of the caller is to then be attended to by a team of well-trained professionals

coming in a vehicle equipped to deal with a wide range of medical emergencies. If transportation of the patient is needed, the next requirement is to have local and appropriately resourced facilities that can provide emergency and potentially definitive care. There are many factors to account for, a multitude of potential stakeholders, and several health delivery system models to consider for the provision of emergency care. This chapter will discuss access to emergency care and relate to our experience of working in the State of Qatar, a country which has been developing very fast since the beginning of the 21st century across several sectors, including healthcare [3].

2. Background

Early in the history of medicine, “healers”, who we would now call physicians, had a general scope of practice and were looking at every all types of complaints from patients [4]. Before the widespread of telecommunication technology, patients were often expected to report to the physician as opposed to the physician receiving an emergency call to then travel to meet their patient. Then there was specialization into medicine and surgery. Those main branches were gradually divided into many others increasing number of subspecialties [5] and lead to the advancement of medical care in general. This has played a role into increasing our life expectancy, especially in the most developed countries. On the other hand, it has also led to the fragmentation of health services. There is a tendency for each service to concentrate on their narrow scope of practice, generally limiting patient access to other services. Some patients’ health issues may not be diagnosed and the complaints they might raise may not be carefully considered and addressed. There was a need for a specialty to look at patients as a whole entity so they can be appropriately referred and benefit from the best line of management from other more specialized physicians or other healthcare professionals. Acting as a patient advocate is often the role of the modern family physician or general practitioner, but it can also be perceived as a gatekeeping activity which raises concerns [6, 7].

Furthermore, there was difficulty in accessing health services in emergency situations. This elicited the need for out of hospital emergency services, primarily started as a transport service, eventually with first aid capability, to pick up patients wherever they were and take them to a hospital where they could be seen by a medical professional [8]. This was followed by the development of the emergency medicine specialty. The role of the emergency medicine specialist is not to provide long-term care and follow up patients until they recover from their illness or injury, but simply to provide immediate urgent care and act as one of the possible entry points into the healthcare system. That healthcare system can then provide longer terms support with follow up appointments organized with the appropriately specialized department(s) and clinicians, or if necessary, the patient may be admitted as an in-patient into the hospital for longer-term care. The issue is that many patients are either playing with the system to their personal advantage to gain quicker treatment to the detriment of others or that they do not understand the real function of an ambulance service and the emergency department (ED). Many people call an ambulance or use emergency departments to obtain quicker service and avoid long delays in obtaining appointments in outpatient clinics. The crowding of EDs has become a growing global problem [9, 10]. There is a need for a new way of dealing with the varying degrees of emergency cases to decongest emergency departments so patients in a real emergency condition can be seen in a timely matter. It could play a significant role in decreasing mortality and morbidity, and making more cost-effective use of healthcare resources.

3. Qatar experience in emergency health access

Qatar is a small country and has a special population distribution. Around 80% of the population is concentrated in the capital city Doha and its immediately neighboring district of Al Rayyan [11]. For a long time, before the rapid expansion of the country in the last 15 years, there was only one ED, in Hamad Medical Corporation (HMC) Hamad General Hospital (HGH), situated in Doha. Patients needed to come from distant places for any medical emergency. This was challenging for many people, especially during nighttime and weekends, as the road network was limited. The Chairman of the HGH Emergency Department, at that time, lead a project to have an emergency room in selected primary healthcare centers. The basis for this decision was to bring emergency services closer to people and decrease unnecessary visits to the main ED in Doha, especially as more than 50% of emergency cases were of low acuity and did not need clinical investigations or admission. The project started during early October 1999 in one center. The services provided were considered a success and these minor emergency rooms were developed in nine primary healthcare centers in the following few years according to the population distribution as illustrated in **Figure 1**. They were called Adult Urgent Care Centers (AUCC).

Figure 1.
Population distribution in Qatar in the year 2000.

The AUCC emergency room in each of the Primary Healthcare Centers included the following:

1. Space: An area near the entrance for easy access and evacuation of critical patients. Doctors were regularly rotated between the AUCC and the main HGH ED in order to maintain their skills. Moreover, the doctors needed to have experience in working alone to make clinical decisions and undertake simple investigations.
2. Staffing: Doctors and nurses were from the ED. The ancillary services (e.g. laboratory, radiology, and pharmacy) were supported by the primary healthcare center.
3. Patient transfer: Arrangements were made with the Ambulance Service to have an ambulance on standby in the vicinity for rapid transfer of patients.
4. Working hours: The AUCC emergency rooms was opened the whole week continuously, day and night.

The AUCCs distributed around Qatar collectively received around 6,000 patients per month. About 97% were treated directly by the AUCC staff and discharged home with the possibility of a referral to the outpatient clinics according to the patients' complaint and needs. Only 3.% were referred and transported to the ED by ambulance.

Table 1 provides the detailed distribution of patients seen and transferred across all the AUCCs over a period of 1 month in 2014.

The project was run by the HMC Emergency Department in collaboration with the primary healthcare centers and the HMC Ambulance Service from 1999 to 2016. By 2016, several new hospitals each with their own ED had opened throughout Qatar to serve major urban areas such as Al Khor, Al Wakra, and Dukhan. Moreover the PHCC started their own urgent care project called “Primary Urgent Care”, and the AUCCs' responsibility transferred to PHCC.

Over the duration of the project, a number of goals were achieved:

1. Emergency services were brought closer to patients hence saving travel time and expenses.
2. Only about 3% of patients needed to be transferred by ambulance from the AUCCs to the ED in Doha.

AUCC	Patients transferred to ED	Patients encounters
Primary Healthcare Center 1	49	486
Primary Healthcare Center 2	18	407
Primary Healthcare Center 3	8	323
Primary Healthcare Center 4	5	181
Primary Healthcare Center 5	15	712
Primary Healthcare Center 6	30	888
Primary Healthcare Center 7	53	1714
Primary Healthcare Center 8	22	1363
Primary Healthcare Center 9	0	29
Total:	200	6103

Table 1.
Sample of AUCC patient encounters corresponding to October 2014.

3. Treatment in AUCCs is less expensive than in the main emergency department, so it facilitated a more cost-effective use of resources.
4. This project served as a training opportunity for doctors to practice medicine with limited resources.

Patient transfers to the emergency department from primary healthcare centers after 2016 was 10% (personal contact).

4. New project proposal

According to the above-mentioned data, we are proposing a new project for distributing patients with urgent complaints according to the level of severity of their medical complaint. This project depends on a common triage system used by the Ambulance Service, the Primary Healthcare system, and the Emergency Department to dispose of patients appropriately.

5. The triad of emergency healthcare

In most countries, there are three health services that deal with patients regardless of their chief health complaint, age, or gender. Those are the prehospital emergency medical services (EMS), commonly managed by one more ambulance services, the hospital emergency departments, and the primary healthcare centers or clinics (PHC).

Traditionally, patients, who require emergency care seek treatment in an emergency department. They may either directly report there using their own means of transportation or may have been brought in by ambulance. Each approach has its own advantages and disadvantages depending on how the system operates and what resources are available. Ambulance services and hospital EDs around the world are often overwhelmed [12, 13] and this is where the primary healthcare system can play an important role in sharing the burden as described above where we presented the Qatar experience. In turn, this relies on facilities being appropriately resourced and the general public being educated to make the correct use of the services available based on the urgency of their apparent or suspected health related complaint.

We propose that the ideal solution to providing patients with effective access to emergency care relies on a collaborative triad composed of a clinically focused ambulance service, a network of primary healthcare centers with a minor illnesses and injury unit, and geographically distributed hospital-based emergency departments, also based on patient density. Their respective scope could be defined as follows:

1. Ambulance service: Mobile team of well-trained clinicians able to deal with all urgent and critical cases in the community setting, supported by appropriate medical equipment, therapeutic drugs, and various means of transportation. Ambulance resources are centrally managed and crews are dispatched from a call center after receiving an emergency call [14]. Upon careful consideration, thorough physical patient assessment, and remote clinical advice from a more senior clinician, ambulance crews may determine if a patient requires or not transportation to hospital or a primary healthcare centre for emergency treatment.
2. Primary healthcare centers: Facilities traditionally focusing on providing non-critical patient care, generally dealing with acute and chronic illnesses, but also delivering preventive care and patient health education. They usually

have limited diagnostic equipment capability (e.g. X-ray, ultrasound) because of their holistic approach to patient assessment and care. They cannot admit patients, but can refer to other specialties. They are generally staffed by nurses and family physicians who may also have additional subspecialties such as women's health and dermatology to cite a few examples.

3. Emergency departments: Hospital department that can be accessed by any patient without prior appointment and that is staffed by a multi-professional team of clinicians able to deal with all emergency conditions. It reacts faster than other specialties in the hospital and provides rapid access to radiology and other urgent services such as cardiology and trauma surgery. They can facilitate admission of patients into the relevant department for definitive care.

6. How to make the primary healthcare centers suitable to manage urgent medical cases

The primary healthcare centers are ideally located in residential areas to be easily accessible to patients for routine checkups and to receive treatment for minor ailments, but others may seek consultations for more urgent medical conditions. To offer this service, primary healthcare centers need to meet a number of criteria with the way they operate, especially in the domains of:

1. Patient screening: As a starting point, a triage nurse should be able to perform some basic assessment to determine if the patient's condition can be dealt with through a normal clinic appointment, as an emergency suitable for the primary healthcare center to deal with, or if an emergency transfer by ambulance should be arranged to a hospital ED.
2. Space management: There needs to be an area near the entrance of each primary healthcare centre set up to receive patients seeking emergency care. It should be equipped to deal with a few patients with minor injuries or other medical complaint at a time. Ideally, the primary healthcare center could also serve as an ambulance service standby location with dedicated parking and welfare facilities for the crew, so if an emergency transfer to hospital is required, there is a chance for an ambulance to be already available within the premises and ready to take a critically ill or injured patient to the nearest ED.
3. Staffing: Staff (doctors, nurses, and ancillary staff) assigned to treat patients in such urgent care clinic should be trained to deal with a wide range of complaints. Following the initial screening, duties will be either to immediately treat patients and discharging them home, or noticing red flags and transferring them to ED for more advanced treatment and possible hospitalization. Ideally, a qualified emergency physician from the nearby ED should have short rotations (maximum of 1 month) in the urgent care clinic of a primary healthcare center so they do not lose their skills in dealing with more critical patients.
4. Administrative issues: There are several administrative requirements for primary healthcare centers to be able to deal with urgent cases and help relieve the pressure on hospital emergency services. For examples:
 - a. Agreement with an ambulance service to transfer patients to and from the primary healthcare center if and as required.

- b. Agreement with a local hospital to accept critically ill patients referred by a primary healthcare center urgent care clinic.
- c. Agreement on a common patient triage system across all the three services to ensure patients are appropriately managed.
- d. Staff duty roster of primary healthcare centers needs to accommodate for extended working hours in order to accept urgent cases as per the local population's needs. The required operational hours could be continuous day and night and including weekends, or less depending on needs.

7. Providing access to effective emergency care

“Access” is a multifaceted term. From the patient’s perspective it may start by picking up the phone to either call an emergency number, a healthcare advice number, or a clinic to book a primary care appointment. Each country, state, or community operates slightly differently but some of the possible decision pathways from call takers in the case of a potential medical emergency are illustrated in **Figure 2**. It may range from the call taker simply providing advice to a patient over the phone regarding a minor ailment, to dispatching an ambulance crew, sometimes with a rapid response vehicle if a higher level of response is required. Call takers may also advise the caller to either call another healthcare assistance number or to call their primary healthcare clinic [15]. Call takers may either be clinicians (nurse, physician...), Emergency Medical Dispatchers (EMDs) with or without clinical training, or even clerical staff [16, 17]. Advice they provide and decisions they make are often based on a scripted series of questions aimed at getting information from the caller to eventually select the most appropriate protocol to follow and potentially dispatch an ambulance or determine that no face to face help was needed [18].

Once an ambulance crew reaches the patient and the assessment is performed. The paramedics can decide of the most appropriate patient disposition which may be one of four possibilities as illustrated in **Figure 3**. Such practice varies vastly between ambulance service providers and from country to country [15, 19]. Many factors may impact on the patient transport decisions made by ambulance crews, such as

Figure 2.
Proposed call taker decision tree when communicating with a patient or caller.

Figure 3.
Possible ambulance crew decisions after assessing a patient face to face.

operating procedures, patient triage algorithms, healthcare policies, relationships with other healthcare entities, staff training, but also the pressure of the call volume the ambulance service is experiencing at the time. In some cases the patient may be provided with reassurance, treated on scene, and discharged by the ambulance crew [10]. The paramedics may advise the patient to seek further medical help if needed, but there are potential negative implications such as subsequent emergency call, delayed care, or even mortality [20]. Another possibility is that the ambulance crew might not be the best suited clinical team to address the patient’s needs so they may be offered transportation to their local PHC or advised to report there by their own means of transportation so the crew can instead deal with more critical cases. Then comes what should be the most common scenario, corresponding to a real emergency call, whereby the ambulance crew needs to provide immediate care and transport the patient to an ED. There are also highly critical cases which require the prehospital intervention of additional clinicians with a wider scope of practice before the patient can be safely transported to an ED or other highly specialized facility. Some specific triage or scoring system based on physiological, motor, and mental status parameters is often used to identify the level of severity of the patient condition [21]. For such cases and depending on the country’s prehospital response model adopted, the call taker may dispatch a prehospital emergency physician with a nurse anesthetist or a critical care paramedic who will help stabilize the patient or perform other lifesaving procedures before urgent transportation to a more specialized facility such as a high level trauma centre, cardiac centre, or severe burns unit.

PHC services in general can play a big role in reducing the number of ED visits [10, 22]. Whether a patient has been referred over the phone to report to a PHC Urgent Care Clinic (UCC) by a call taker (**Figure 2**) or by an ambulance crew advising them to self-transport there (**Figure 3**), or a patient is directly self-reporting there, the triage nurse will first assess them. The possible outcomes of a visit to the PHC UCC are illustrated in **Figure 4**. The patient may be immediately treated (depending on how busy the UCC is) and discharged. If the case is a more complex, treatment may be initiated and the patient will be reassessed after a short period of time (e.g. 2 hours). Depending on the evolution of the patient’s condition, they may either be discharged or an ambulance transfer may be arranged to the nearest ED. If from the

Figure 4.
Disposition of patients reporting to a primary healthcare center urgent care clinic.

Figure 5.
Emergency Department triage algorithm incorporating the recommendation for low acuity patients to report to a Primary Healthcare Center Urgent Care Clinic.

initial assessment, the patient is determined to have deteriorated from the previous interaction with the call taker or ambulance crew, only stabilization measures will be performed and arrangements will be made to transfer the patient to ED without delay. Lastly, if the patient requires special emergency care (e.g. myocardial infarction), an emergency call will be made so they will be transported by ambulance to a specialized facility as a high priority case, possibly with a more medically advanced team (e.g. accompanied by a critical care paramedic). The presence of an ambulance on standby near the PHC is an important element for the rapid transfer of such cases.

Lastly, the case when a patient reports directly to an ED needs to be considered. Again some form of triage needs to be implemented to determine if the patient is trying to make use of the most appropriate service. There are several triage systems,

for example the Canadian Triage and Acuity Scale (CTAS) and many other validated triage systems are commonly used in emergency departments worldwide [23, 24]. Most systems result in EDs seeing all patients, even those with a very low acuity level, but their non-urgent triage level often results in them experiencing a potentially very long wait time before being seen after their initial assessment. This is usually not a pleasant experience for patients and will affect their satisfaction level with the overall care experience eventually received [25]. **Figure 5** proposes an ED triage algorithm incorporating a pathway whereby low acuity patients are asked to report to a Primary Healthcare Center Urgent Care Clinic or to book a primary care appointment. Probably not the desired outcome of a patient's visit to the ED, this approach would be expected to significantly relieve the pressure on EDs and contribute to a better use of the ED resources and expertise. Higher acuity patients will however be treated more rapidly, according to the severity of their health condition, and reassessed to determine if they should be discharged with or without a referral for a follow up out-patient consultation, or be admitted into hospital for definitive care. In some particular cases, if the patient walked-in, was wrongly transported to hospital by ambulance, or their condition changed, they may need to be urgently transferred to a specialized emergency facility (e.g. trauma, cardiac, burns unit) after having been stabilized.

8. Triage systems

The baseline for this process depends on having a triage system accepted by all services. Until now there is no single internationally accepted triage system [26] and instead many triage systems have been developed and are used in different countries all over the world [24]. The most widely used and validated triage systems divide patients into 5 acuity levels [27, 28]. Some of the most commonly used systems include:

1. The Canadian Triage and Acuity Scale (CTAS): this is a 5-level acuity system used by the nurses in the ED to prioritize patients. Prehospital use has been tried in paper cases and found to be applicable. There has been a prospective clinical trial which compared the ambulance application of CTAS to the ED nurses application. The interrater reliability was moderate. The study concluded that CTAS can be used reliably in the prehospital setting [29].
2. The Australian triage system: It is also a 5-level triage system that concentrates on the maximum time the patient can wait before getting hospital care. It can be used by paramedics in prehospital cases for prioritization of patients [30].
3. The Manchester triage system (MTS): It depends on flow charts which the nurse choose according to the patient's complaint. Following those charts helps the nurse to determine to which of the five categories the patient belongs to [31].
4. The emergency severity index (ESI): This is an easy to implement 5-level triaging system used mainly in the United States. It uses one algorithm for all patients to determine the patient's triage severity level [32].

There are many other triage systems used by emergency departments and pre-hospital care services, some are validated while others are not [33]. Until now there is no single internationally accepted triage system [26]. This is probably because not all countries are equally equipped and prepared to implement a common triage system and act according to the findings of the triage levels, however they simply try to deliver the best possible care to all patients.

The use of the primary healthcare centers and family physicians in providing emergency care has been practiced in several countries, especially in small cities and rural areas [10, 34]. The American Association of family physicians published a position paper highlights the many benefits of using “family medicine centers” (i.e. primary healthcare centers) and family physicians for the delivery of emergency and urgent care [35]. They also mention that the provision of emergency care “require a cooperative relationship between among a variety of health professional”. Some of the benefits include:

1. Delivering urgent care is part of the comprehensive patient care model adopted by the family physician.
2. The geographical distribution of primary healthcare centers nearby people facilitates their easy and rapid access to their healthcare needs.
3. More than 50% of urgent cases are simple and can be managed efficiently by family physicians.
4. PHC are more cost-effective facilities to treat minor emergency cases as it has been determined that, in the United Kingdom, treating one patient costs 124 Great Britain Pounds (GBP) in the ED while it costs only 32 GBP in a primary care clinic setting [36].

9. The key pieces to effective emergency service provision

To implement the proposed solution the following needed:

- A. Ambulance service and call center: The key factor in this system is the presence of a good ambulance service with an optimal distribution of its resources at standby locations situated around the state or country (**Figure 6**) and skilled staff, coordinated by EMDs responding to the emergency calls gathering information form patients, providing them with advice, and dispatching ambulance crews as required (**Figure 7**) [14, 37]. Whether it is through a emergency or medical advice phone number, healthcare call center staff can play a key role in addressing a large number of simple medical cases by providing telephone advice and consultations [17, 38]. When an ambulance is dispatched, upon reaching the patient(s), paramedics can assess their health condition using a validated triage system, and

Figure 6.
Standalone ambulance standby locations geographically distributed based on call volumes in urban and rural areas to reach patients rapidly.

Figure 7.
Emergency medical dispatcher in the Ambulance Service control room.

initiate treatment before deciding of the most appropriate patient disposition (**Figure 3**). We recommend the use of the emergency severity score (ESI) because it is easy, fast, and requires little training on the part of the clinicians [28, 32].

- B. Primary Healthcare Centers: an urgent care room should be available 24/7 in primary healthcare centers to receive minor emergency cases (**Figure 8**). The source of these cases may be walk- in patients or low acuity patients transported by ambulance. An ambulance standby location should ideally be located near the PHC to facilitate the rapid transfer of patients who require a higher level of care to the nearest hospital ED or other specialized medical facility.
- C. Emergency Department: The ED should be available and have the capacity to receive high acuity emergency patients coming by road or air ambulance, but

Figure 8.
Emergency room in primary healthcare center. It is near an entrance for easy dropping and transfer of patient by ambulance.

Figure 9.
Emergency department available 24/7 with the capacity to receive patients coming by ambulance or by their own means of transportation.

also by their own means of transportation (**Figure 9**). At the point of entry it is now common good practice to have a triage area for walk-in patients. The lowest acuity patients should be advised to visit their local PHC urgent care clinic (**Figure 5**). This will keep space and resources available for the patients with more severe conditions and need to be managed in the ED.

D. Support: The successful implementation of such initiative requires the support from higher authorities that can promote the collaboration between the various institutions involved. There is also a need for public education to explain how emergency services provided by the various institutions should be used effectively.

10. Conclusion

The World Health Organization (WHO) made access to emergency care services a part of human rights that should be available for everybody regardless of gender, nationality, or condition [1]. This proposal is a method to decongest the emergency departments and make it easy for people to get emergency care or advice in timely manner. This would enable EDs to have a surge capacity in case it is needed. There are difficulties in the implementation of such processes due to general public behaviours and expectations, and operational changes required of PHC, call centers, and clinical staff from a training perspective.. These difficulties can be managed by political will, staff training, and educating the general public.

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