We review the development of civilian out-of-hospital and hospital-based emergency medical care in Iraq, focusing on the non-Kurdish regions. Emergency medicine in the country has made encouraging steps during the last several years, including the establishment of national emergency medicine policy, the training of out-of-hospital caregivers, the education of physicians currently working in Iraqi emergency departments, and the development of emergency medicine residency programs, among others. The utilization of a national Emergency Medicine Working Group has been a key resource in the development of emergency medicine in the country, a strategy we recommend to others aiding low- and middle-income nations. [Ann Emerg Med. 2009;xx:xxx.]

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INTRODUCTION

For the majority of countries in the Middle East, formalized emergency care is a relatively new concept.¹ Its development in Iraq has had the additional challenges of violence, sanctions, and intellectual isolation. In Iraq, the emergency medical infrastructure is still in the primary stages of development. However, the last several years have shown dramatic improvements in the civilian emergency medical system, including the training of out-of-hospital providers, the education of physicians currently working in the emergency departments (EDs), the beginning of emergency physician specialty training, and the creation of a national plan for the development of emergency medicine.

IRAQI POLITICAL BACKDROP

Although there have been numerous setbacks, and scattered bombings continue, the security situation in Iraq has significantly improved from its nadir in 2006 to 2007.²,³ One marker of Iraqi recovery is oil exports, which dominate the country’s economy and have now returned to preinvasion levels.²,³ Since 2005, Iraq has allocated more than $1 billion (in US currency) annually, primarily from oil revenue, to health care.⁴ However, corruption constitutes a major impediment to getting these funds through the government to its constituency, a problem openly acknowledged by the Iraqi leadership. According to a survey by Transparency International, in 2008 Iraq was one of the world’s 3 most corrupt countries (along with Somalia and Myanmar).⁵

The current decrease in violence is an important opportunity for Iraq to grow into a fully functioning nation-state. Public services, such as water, sewage disposal, electricity, transportation, and health, although still less than optimal, have recently shown significant signs of progress.³ To expedite relief for the population, the aid community has called for a “humanitarian surge” to improve basic services and meet the essential needs of the populace.⁶

COALITION MILITARY MEDICAL EFFORTS

Although coalition forces have provided medical aid to Iraqi civilians through military health channels, this assistance is well short of the full need for emergency services in the country. Coalition forces possess a sophisticated medical and trauma care system. They report that approximately 60% to 65% of their in-country care has gone to Iraqi nationals.⁷,⁸ Coalition medical resources, from forward surgical teams to Level III hospitals, have described care provided for Iraqi patients.⁸-¹² For example, physicians at the 332nd Air Force Theater Hospital in Balad, the largest coalition trauma center in the Iraqi theater, describe treating 85 children for trauma and other medical problems in one 17-month period.¹⁰

However, the primary mission for the coalition military health care system is to provide care for coalition troops. We estimate from published literature⁸,¹³ that coalition forces treat roughly 10,000 Iraqi nationals at military Level III hospitals in the country per year, with a portion of this number being composed of Iraqi civilians, as opposed to Iraqi military. In a country with a population of close to 29 million people, this
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Care covers only 0.03% of the population per year, clearly far below needed levels (for rough comparison, in Iraq this is equivalent to 1 emergency treatment per year for every 2,900 people; in the United States, there is roughly one 911 telephone call per year for every 1.25 persons). Although there have been scattered attempts by coalition medical personnel to provide training to their local counterparts, in practice little of the forces’ cutting-edge medical knowledge has transferred to the Iraqi civilian health sector.

HEALTH CARE SYSTEM

Once thought to be among the best in the Middle East, Iraq’s health care system has significantly deteriorated throughout the last 20 years. The Iraqi Ministry of Health provides governmental authority for the system. The 18 Iraqi governorates (similar to US states) all have a director general of health, except for Baghdad, which has 3. According to recent Ministry of Health data, Iraq nationwide has 1,800 public primary health care centers and 180 public hospitals (respectively, 0.6 and 0.06 per 10,000 Iraqis). Services provided by this government-run National Health Service are, in theory, free. However, in these clinics and hospitals, patients or their family members often have to purchase disposable goods (eg, medicines, catheters, other supplies).

Kimadia, a state-owned company, purchases drugs and medical equipment for the public sector, with the intent to provide disposable medical supplies to the population at subsidized rates. However, the Iraqi health care system has significant problems getting these goods, especially essential drugs and disposable medical equipment, to its consumers. Limiting factors include an extended procurement process, a lack of sufficient organizational infrastructure, and corruption. Recent administrative improvements have begun to address these prevalent problems.

Most Iraqi physicians work in the National Health Service during the morning hours and then in private clinics or hospitals in the afternoon. The private clinics provide a parallel health care system for Iraqis with sufficient funds. Private insurance is essentially nonexistent, except for a handful of small programs provided by specific companies for their employees. If they are able to afford the out-of-pocket costs (eg, approximately US $13 for a visit without tests to more than US $1,000 for a cholecystectomy), Iraqis tend to prefer the private system because of shorter wait times and the perception of increased attention from health staff.

The second section, “Overarching Components,” provides information on a host of system-wide issues that affect the provision of emergency care in Iraq. These include advocacy, quality improvement, health and injury surveillance, system administration, continuing medical education and research, and disaster planning.

The third section, “Specific Focus Areas,” discusses 4 main delivery areas identified for specific strengthening. Public
Education" outlines outreach activities geared toward prevention, early recognition of acute conditions, community first aid, and access to emergency medical services (EMS). “Out-of-Hospital Setting (EMS)” provides policymakers with methods to improve the communication system, EMS providers, and transport and EMS operational framework in Iraq. Similarly, “Provincial Setting (Primary Health Clinics)” provides information about the development of emergency medicine in rural areas of the country. Finally, “Hospital-Based Emergency Care” outlines improvements for emergency physician specialty training, ED support staff education, trauma center establishment, and referrals and interhospital transfer organization.

The fourth and final section, “Objectives and Strategic Targets,” lists by objective more than 50 specific targets generated from the previous sections. Although too numerous to list here, these targets form the functional backbone of the national emergency medicine strategy (see Figure 2 for example). Included in the National Emergency Medicine Strategy is also a detailed implementation plan, listing objective and target by goal date for initiation and completion.

### OUT-OF-HOSPITAL EMS

In Iraq, impromptu arrangements with taxis, family members, or bystanders provide transportation to the hospital for the majority of medical emergencies. The primary exception to this rule is the use of ambulances during traumatic multiple casualty incidents. Although ambulance-type vehicles were present in the country before 2008 (when the International Medical Corps and Ministry of Health began efforts to strengthen emergency medical care in the country), the medical system previously utilized the vehicles primarily for simple transport of patients, with little to no medical care provided during transit.

Personnel called musaafeen (roughly translated as “paramedic”) staff the vehicles. Historically, they provided minimal medical care and had no specific emergency medicine training (education ranging from sixth grade to 2 years of general health instruction). In the beginning of 2008, the Ministry of Health, through a structured partnership with the International Medical Corps, began training the musaafeen to the equivalent level of an EMT-Basic. By the end of 2009, the Ministry of Health had certified more than 1,000 musaafeen (International Medical Corps private data).

Musaafeen instruction (translated into Arabic) is based on a standard US format: the National Registry Emergency Medical Technician–Basic curriculum and Mosby’s EMT-Basic Textbook (2nd Ed). The Ministry of Health and the International Medical Corps have established a training program in Baghdad and, using a train-the-trainer model, are now expanding the program to the provincial governorates.
A core faculty of 10 Iraqi physicians (trained by International Medical Corps staff) serve as key musaafeen trainers, with more than a hundred additional physicians (those having taken the physician course described later) assisting with musaafeen education throughout the country. The Ministry of Health chose the initial EMT students from the ranks of the musaafeen, all of whom will return to their jobs after finishing the course. Approximately 25 to 30 musaafeen are in each 1-month course, with several courses taught simultaneously within the country.

Iraq has no shortage of challenges to the provision of out-of-hospital care. Such barriers include a lack of first aid training and awareness by the public, inadequate emergency supplies on the ambulances, issues with scene and general safety, and increased response times because of police checkpoints, traffic, and variable security. The National Emergency Medicine Strategy17 addresses many of these areas to promote system-wide improvements in emergency care.

COMMUNICATIONS AND OPERATIONAL FRAMEWORK

A functioning EMS system needs an effective communications network, which starts with a call from the public. In Iraq, the telephone number 122 functions as the universal number for emergency medical response (with separate numbers for police and fire). Nationwide, this number received approximately 24,000 calls in 2008.

The telephone number 122 connects calls from the public to a central dispatch center located in Baghdad. Central dispatch records the location and then calls one of 64 ambulance dispatch centers, depending on the closest proximity to the caller. The ambulance dispatch center then directs one of its vehicles to the source of the call. On reaching the scene, the musaafeen assess the patient(s) and then decide which hospital is the most appropriate destination.

Although there is no mechanism for the musaafeen to notify the receiving hospital of the patients’ impending arrival, a government purchase of radio communication equipment should add this component to the system by the end of 2009.

Responding musaafeen presently make triage destination decisions according to experience, with basic guidance available from the central dispatch center (there is presently no standardized training or educational background for dispatch center personnel).

To date, there have been no formal algorithms to systematically sort patients according to specific injuries or medical illnesses, although efforts are under way to implement protocols in the future. Such decisions are especially important in Iraq because many of the hospitals (consistent with the older British system) are segregated by specialty, with individual buildings for obstetrics, pediatrics, surgical subspecialties (eg, neurosurgery, ophthalmology), and medical specialties (eg, cardiac, respiratory). None of the private hospitals accepts emergency patients, and there are thus no Emergency Medical

Treatment and Active Labor Act (EMTALA) or similar laws governing transport decisions.

There are numerous challenges, both technical and organizational, to the current communications system in Iraq. One of the main issues is a lack of familiarity by the public (and many medical staff) with the existence of a functioning 122 number. The Ministry of Health estimates that only 10% of the population is aware of the availability of an operational 122 number. This limitation is multifactorial: in previous years, there were insufficient ambulances available, the musaafeen lacked meaningful training, and variable security caused delayed response times. The Ministry of Health and the International Medical Corps are producing public service announcements for television to increase the publicity of the 122 number. Given the high prevalence of cell telephone usage, the Ministry of Health also plans to use mass text messaging to publicize the universal number.

PHYSICIAN SPECIALTY TRAINING

Although the specialty of emergency medicine has developed globally during the last several decades, Iraq has missed the improvements such specialization brings. At the beginning of 2008, the Ministry of Health, with the assistance of the International Medical Corps, sponsored the first formal lectures in emergency medicine in Iraq as part of a continuing medical education program. Emergency medicine specialists from the United States and the United Kingdom teach this 4-day lecture series, with a curriculum of rotating topics. The course, now repeated annually, aims to familiarize Iraqi physicians assisting with emergency medicine development in the country with up-to-date international practice, including the use of ultrasonography and other advances in emergency medicine care.

Although there are currently few Iraqi emergency medicine specialists within the country (all having received their training abroad), the Ministry of Health and Ministry of Higher Education have identified the training of emergency physicians as a national priority. As an incentive, the government excuses residents choosing emergency medicine from a compulsory rural service year, which typically precedes specialty training. Iraq follows the British system of medical training, and physicians normally take the Arab boards, after years of semistructured instruction, to gain certification in any medical specialty. For emergency medicine, this requires 4 years of hands-on training in the ED and other relevant departments before sitting for the final examination.

At the present time, Iraq has the first 2 classes of emergency medicine residents working in the ED and studying to take the Arab boards (Table). Because of a lack of emergency medicine specialists, the Ministry of Health has selected physicians from various medical specialties (eg, general surgery, anesthesia, medicine) to train the residents and help them study for the examination, similar in practice to the incipient stages of emergency medicine in the United States. Although not yet available, future initiatives to provide a free curriculum for
emergency physician training in low-resource settings, such as those by the American College of Emergency Physicians’ Essentials of International Emergency Medicine Task Force,18 would be beneficial toward this end.

In the interim, before the actualization of full specialists, the Ministry of Health, with the assistance of the International Medical Corps, is updating the skills of physicians currently working in EDs across Iraq. The International Medical Corps is presently training these physicians in a 1-month course that covers material inclusive of advanced cardiac life support, advanced trauma life support, and advanced airway instruction. Instructors include one US emergency medicine academic specialist (R.I.D.) and senior Iraqi physicians of various specialties (primarily anesthesia, general surgery, and cardiology). A clinical portion includes tracheal intubations on live patients, supervised by Iraqi anesthesia personnel, in addition to an assortment of other emergency procedures, including an animal (sheep) laboratory. This 1-month course had trained more than 300 people by the end of 2009.

**ONGOING CHALLENGES TO HOSPITAL-BASED EMERGENCY CARE**

Historically, the Iraqi medical system has given emergency medicine low priority, with junior-level physicians-in-training staffing the critical care areas (with limited consultation resources, especially at night). The dangers of the practice are easily observable in practice, with a lack of sufficiently trained physicians during the first stages of emergent illness.

EDs in Iraq typically consist of separate sections run by different departments. There are normally separate areas for surgery, medicine, obstetrics/gynecology, and pediatrics, further subdivided into sections for male and female patients. As noted previously, many of the hospitals are segregated by specialty, which can make the care for patients requiring multiple specialists (eg, polytrauma victims) exceedingly challenging because the patients need to be serially transferred from one hospital to another to receive the appropriate care.

A lack of specially trained emergency ancillary staff is also an important problem for the functioning of Iraq’s EDs. At present, there is a severe shortfall of nurses, administrators, and other hospital personnel specifically trained to the unique demands of the emergency care environment. This is one reason why the majority of hospitals in Iraq currently lack a triage system for ambulatory patients waiting for emergency care. Instead, with the exception of trauma multiple casualty incidents, patients wait in a standard line without regard to acuity.

The security of the ED environment in Iraq is another challenge to the development of emergency medicine in the country. Medical staff report frequent, severe security problems. Because of the deficiencies in ancillary care, family members provide much of the assistance at the bedside. During emergencies, these frequently large groups can become dangerously agitated when their loved ones are in extremis. Although there are a few armed hospital security personnel available, they can easily become overwhelmed during multiple casualty incidents.

**OUTLOOK FOR THE FUTURE**

The outlook for emergency medicine development within Iraq has greatly improved since 2008. The Iraqi Emergency Medicine Working Group (to our knowledge, a novel approach to emergency medicine development) has proved to be a key resource in the progress of emergency medicine in the country, providing a venue for stakeholders to take ownership of emergency medicine development. We recommend the establishment of such a group as a model strategy to build effective emergency medicine infrastructure, organization, and specialty care in the low- and middle-income setting.

In addition to addressing the ongoing challenges already discussed, there has been significant interest within Iraq in the future development of a modern trauma center system. The International Medical Corps is working with the Ministry of Health to find the ideal placement of specialized trauma care facilities, in accordance with geographic distribution and need. The Ministry of Health, with assistance from the International Medical Corps, has developed trauma center guidelines19 similar to those used by the American College of Surgeons, specifically for Iraq, which will be implemented during the next year.

The Iraqi Ministry of Health and the country’s physicians have been proactive about targeting emergency medicine as a priority for the country. The 5-year plan for improvement in this area should pay significant health dividends and greatly improve the emergency and trauma care for the civilian population. The International Medical Corps’s comprehensive emergency medical care development program in Iraq, in conjunction with the utilization of an Emergency Medicine Working Group, is a useful model for low- and middle-income nations seeking to improve emergency care. Iraq’s progress toward the provision of emergency medical care for its population may serve as a useful example to the development of emergency medicine throughout the global health arena.

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Short abstract for Donaldson et al, YMEM We review the development of civilian out-of-hospital and hospital-based emergency medical care in Iraq, focusing on the non-Kurdish regions. Emergency medicine in the country has made encouraging steps during the last several years, including the establishment of national emergency medicine policy, the training of out-of-hospital caregivers, the education of physicians currently working in Iraqi emergency departments, and the development of emergency medicine residency programs, among others. The utilization of a national Emergency Medicine Working Group has been a key resource in the development of emergency medicine in the country, a strategy we recommend to others aiding low- and middle-income nations.