

From Baghdad to Boston: International Transfer of Burned Children in Time of War

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A large portion of the casualties admitted to military hospitals on the battlefield in Iraq consists of children, of whom 13% had burns. The U.S. Army Combat Support Hospital (CSH) in Baghdad, faced with an influx of such patients, successfully transferred selected burned children by commercial airlines to the Shriners Hospital for Children in Boston, Massachusetts (SHC-B). The authors aimed to document this process, from both an ethical and a procedural standpoint. Care was conducted in six phases: 1) admission to the CSH; 2) selection for transfer; 3) burn care at the CSH; 4) travel to the United States; 5) burn care at the SHC-B; 6) return to Iraq. Transfer and SHC-B care were funded by charitable organizations. A review of patient records was performed. Eight acutely burned pediatric patients participated in this program. All were successfully transferred, treated at SHC-B, and returned to Iraq. They ranged in age from 1.7 to 17 years and in burn size from 6 to 53% of the TBSA. At SHC-B, the hospital length of stay was 14 to 132 days; up to 23 visits to the operating room were performed for acute and reconstructive burn surgery. The cost of war includes the care of injured civilians, and includes burned children. For selected patients, transfer out of the combat zone is one method of fulfilling this obligation. (*J Burn Care Res* 2013;35:369–373)

Burns accounted for 13% of the large number of children admitted to U.S. combat support hospitals (CSHs) during recent conflicts in Iraq and Afghanistan.¹ At the busiest CSH in Iraq, located at Ibn Sina

Hospital in Baghdad, many of these burned children underwent wound care and discharge to home or transfer to a local facility. Some underwent definitive care at the CSH, to include excision and grafting.² A small number underwent initial care at the CSH, followed by transfer to one of the Shriners Hospitals for Children in Boston, Massachusetts. We conducted a review of the care of the patients transferred from the 86th CSH in Baghdad to the Boston Shriners Hospital for Children during 2007–2008. We aimed to document this complex process and to review the clinical course of the patients.

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METHODS

This retrospective study was conducted under a protocol reviewed and approved by the U.S. Army Medical Research and Materiel Command Institutional Review Board, and was in accordance with the approved protocol and the Helsinki Declarations of 1975 and 1983. The care of the patients selected for care in the United States was conducted in six phases:

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- Admission to the CSH
- Decision to transfer to Shriners
- Burn care at the CSH and preparation for travel
- Travel to the United States
- Treatment at Shriners
- Return to Iraq.

RESULTS

Phase 1: Admission to the CSH

Civilians were burned not only as a consequence of acts of war or terrorism (eg, improvised explosive devices [IEDs]) but also, more frequently, as a result of accidents.³ The latter category reflected the long-standing deterioration in public infrastructure and socioeconomic well-being in Iraq.⁴

The ethical basis for providing civilians with definitive burn care at the CSH was as follows. Civilians presenting to the CSH were accepted for the emergency care of life-, limb-, or eyesight-threatening injuries. Although CSHs are not designed, staffed, or equipped to provide definitive care to burn patients, wartime Iraqi healthcare facilities were less capable.^{3,5} Thus, transfer of civilian burn patients from the CSH to a local hospital could not be accomplished without consigning these patients to a lower standard of care and, in some cases, at significant risk to their lives. Whereas it could be argued that initial resuscitation and surgery were sufficient to rescue civilian patients with mechanical trauma from immediate threat to life and limb, the same could not be said for extensively burned patients. In essence, the latter category of patients presented with *persistent life-threatening trauma*, which would continue to place them at risk until the burns could be excised and successfully closed.

Phase 2: Decision to Transfer to Shriners

At the same time, it was evident that the CSH could not provide the same level of care as a U.S. burn center. Survival of patients with burn size greater than about 50% of the TBSA was infrequently observed. Thus, such patients were usually triaged to the expectant category on admission to the CSH, whereupon they received end-of-life care. Some patients with smaller burns who should have survived, that is, in the 20 to 50% TBSA range, still died. The reasons for this increased mortality no doubt were multifactorial. Nevertheless, experience with such deaths was a major factor in our decision to pursue transfer of selected patients with intermediate-sized burns to the United States.

In late 2007, the continued influx of seriously burned children to the CSH in Baghdad; the renewed

pace of combat operations; a continued shortage of beds and of skilled burn personnel in both the CSH and the Iraqi civilian sector; and the maturation of administrative and funding mechanisms led us to pursue the transfer of some of the children to a Shriners Hospital for Children in the United States. Two categories of children who might benefit were identified: those with complex reconstructive needs; and those whose burn size, though potentially survivable, predicted a protracted hospital stay. The criteria for transfer eligibility included the following:

- Extent of burn 50% TBSA or less
- Age 18 years or less
- Adult female family member available to travel and stay with patient at Shriners
- Pain controlled with oral medications
- No requirement for endotracheal intubation
- Infections absent or controlled
- Wounds without need for dressing changes during transport (eg, manageable with silver nylon dressings).

The requirement for a female nonmedical attendant stemmed from a U.S. immigration policy that required a lengthy period of administrative review for males of military age. This was particularly onerous for some families to meet, because of cultural-religious limitations on the ability of women to travel unaccompanied by a male family member, and because most women of child-bearing age were responsible for the care of their children. Many of the other criteria were required to allow the patients to travel successfully for 15 hours on commercial airliners, which resulted in dramatically lower costs vs using air ambulances.

Phase 3: Burn Care and Preparation for Travel

Approximately 6 weeks were required to prepare patients medically for travel and to complete the extensive paperwork. During this period, no guarantee existed that a given patient would be able to travel. Therefore, an aggressive approach to burn care was instituted.

A burn surgeon from the U.S. Army Institute of Surgical Research was assigned to the CSH during the period described in this report. This surgeon trained a Burn Wound Care Team of six nurses at the CSH. Nurses provided physical and occupational therapy by performing daily range of motion, ambulation, splinting and positioning of injured limbs and assisting with activities of daily living, and encouraged the family members to assist with these goals. At the CSH, military providers managed multiple cultural,

religious, and social aspects of the healthcare process. Because of culinary differences and Islamic dietary requirements, getting the children to meet their caloric needs often meant paying for food from the local economy. Whereas rooming in by a close relative is an indispensable part of the healing process for hospitalized Iraqis, often this was impossible because of poverty, distance, family responsibilities, or employment. Most of these patients were Muslims. Nursing care was minimized during prayer times, and holiday observances like the Ramadan fast were honored. The staff adapted to language barriers through the use of interpreters and learning some Arabic.

The Bilingual-Bicultural Advisor at the CSH was an Iraqi-American case manager who spoke both Arabic and English. She performed critical roles by deciphering and managing the administrative process, coordinating with nurses and families, and performing multiple trips to the U.S. Embassy and Iraqi Foreign Ministry to obtain passports for the children and their guardians.

Phase 4: Travel to the United States

The costs of commercial air travel from Iraq to the United States and back, and of living expenses in Boston, were funded by a charity, the Iraqi Children's Project. Flights to the United States were accomplished over approximately 5 days, as follows:

- U.S. Army medical helicopter from the CSH to U.S. Air Force Clinic, Baghdad International Airport
- Commercial aircraft to Kuwait International Airport
- Stay at Kuwait City burn center till appointment for visas in the Consular Section, U.S. Embassy
- Commercial aircraft to Washington, DC
- Commercial aircraft to Boston
- Ground ambulance transport to Shriners Hospital.

Extensive preflight teaching for the guardian was required. This included wound care and medication administration. Because this was potentially confusing, guardians were provided with written instructions in Arabic. In addition, nursing staff color-coded the medication bottles, gave the family member an analog watch, and made a chart with clock faces to indicate which medications were to be given at what times.

These transfers were accomplished without serious mishap despite the potential for clinical deterioration or administrative failure.

Phase 5: Care at Shriners

The cost of care at the Shriners Hospital was borne by the Shriners organization. There, all eight patients continued on their paths to recovery (Table 1). The mean intensive care unit length of stay at the Shriners Hospital was 26 days and the mean hospital length of stay was 67 days. The average number of surgeries for the children was 10.5. While caring for these eight children, the staff at Boston Shriners provided 536 inpatient hospital days of care, including 208 intensive care unit days and 84 burn operations.

Developing partnerships with local Iraqi organizations helped to acculturate the Shriners clinical and support staff to Iraqi patient needs, to obtain translation services, and to provide local housing while patients awaited later reconstructive operations. To improve quality of life and to reduce costs, it was important to establish a system supporting outpatient care for the children. The local Muslim community and a local charity, the House of Peace, provided housing for the children and their escorts, as well as food, transportation, translation services, schooling, and socialization. Having several Iraqi children in the system at the same time seemed to enhance their enjoyment, comfort, and sense of belonging, and to emplace a natural social support system for the caregivers.

Table 1. Patient data

Age (yrs)	TBSA (%)	Location	Mechanism of Injury	OR Visits	LOS	ICU LOS
17	45	Face, legs, arms, and torso	Domestic abuse (flame)	17	107	68
10	35	Face, legs, arms, and torso	RPG	8	61	16
3	37	Face, arms, torso	Candle/matches	9	37	20
9	53	Torso, arms, legs	IED	23	132	56
11	30	Torso, arms, face	Playing with matches	9	70	6
1.7	40	Face, torso, legs	Kerosene lamp	12	66	41
7	6	Hands, feet	Domestic abuse (lye)	5	51	0
8	40	Face, torso, arms	Kerosene stove	1	14	0

OR visits, number of operations performed at the Shriners Institute; *LOS*, length of stay at Shriners Hospital; *ICU LOS*, Shriners intensive care unit length of stay; *RPG*, rocket-propelled grenade; *IED*, improvised explosive device.

Phase 6: Return to Iraq

All eight children received specialized burn care in Boston and safely returned to their families in Iraq by a commercial airline, again funded by the Iraqi Children's Project. The patients followed up with U.S. Army personnel at Ibn Sina Hospital, until winter of 2009 when the CSH moved to a new location. At that time, they were lost to follow-up.

DISCUSSION

The principal finding in this review of eight burned Iraqi children transferred from a Role III U.S. Army CSH in Baghdad to the Shriners Institute was that with adequate funding, international evacuation of selected patients with intermediate size burns and/or complex reconstructive needs can be safely accomplished. In addition, we reiterate the following observations: 1) injured civilians form a significant portion of the workload at military hospitals on the battlefield; 2) these civilians include children (and adults) with severe burns; 3) military expertise with definitive care of burn patients is limited; 4) once trained by subject matter experts, teams of dedicated military staff can provide life-saving multidisciplinary burn care on the battlefield.

Civilians (including children) have occupied a significant portion of the workload of military hospitals on the battlefield during WWII,^{6,7} wars in Korea⁸ and Vietnam,^{9,10} and the recent conflicts in Iraq and Afghanistan.^{1,11} This phenomenon persists, unrelated to whether or not the battlefield hospital defines such care as being part of its mission.

The principal mission of a U.S. Army CSH is to provide life-saving care, focused on surgical care, to U.S. combat casualties on the battlefield. Holding capabilities are limited. The intent is for patients who require continued hospitalization to be aeromedically evacuated to the Role IV hospital (ie, Landstuhl, Germany) within the timeframe dictated by the theater evacuation policy (approximately 72 hours).¹² Local nationals, to include allied and enemy combatants and civilians, also receive life-saving care at the CSH. But such patients are not evacuated out of theater.

Thus, a process must be instituted for transferring local national patients to local healthcare facilities. The majority of local national patients at the CSH in Baghdad who required surgery were transferred to a local hospital at Medical City in Baghdad, and were lost to follow-up. For thermally injured local Iraqi patients at the CSH during the time of this study, this option was suboptimal because the CSH, despite

its limitations, could provide better burn care than wartime Iraqi hospitals.^{13,14}

Four factors led us to pursue the unusual additional step of transferring selected burned children to the Shriners Institute. First was the prolonged length of stay typical of patients with severe burns. In the midst of an ongoing war, it was necessary to take all possible measures to keep beds open for the next influx of combat casualties. Though administratively difficult, transferring pediatric patients reduced their length of stay at the CSH and freed up beds. Thus, it made sense from the standpoint of a business-case analysis.

Second, despite our success in caring for patients with burns in the 20 to 50% range, our mortality rate was still unacceptably high. The challenges at the CSH included:

- Aging physical plant
- Absence of isolation rooms
- Inferior housekeeping capability
- Limited shower facilities
- Lack of multidisciplinary support staff (eg, occupational therapy, physical therapy, dietary, behavioral health)
- Prior burn experience confined to one individual, the Army burn surgeon
- Interspersion of burn patients with the general patient population
- Lack of established multidisciplinary team processes and procedures
- Psychological factors affecting staff, relating to deployment and inexperience with burns.

The third factor related to the morale-boosting effect of successfully caring for this group of severely injured children. Others have used words like "heart-ache"¹⁵ and "emotional exhaustion" to describe the experience of deployment for 12 to 15 months to a busy CSH. Expending the level of effort required to care for these burn patients may seem counter-intuitive, and the option of doing nothing appealed to a few. On the contrary: whereas the majority of patients passed through the CSH, never to be heard from again; and whereas many staff suspected that Iraqi hospitals in wartime Baghdad would not be able to provide the same level of care to civilian casualties transferred there; the care of the patients described herein allowed the staff to experience definitive success. We also sought to positively affect morale in the families and to build rapport with the communities of our patients. We do not have the means to measure the latter effects.

The fourth and final factor was our individual responsibility for the well-being of these patients, which stemmed not from tactical military considerations but

from doctor–patient and nurse–patient relationships. There is potential for ethical conflict between a military medical officer’s duty to the chain of command (which must keep beds open and conserve supplies), and his or her duty to individual patients. A thorough discussion of this problem is beyond the scope of this article, but we are grateful that the command group of this hospital supported our efforts to secure excellent follow-on care for these patients.

We believe that allowing the Army staff to save the lives of these eight children improved staff morale and enhanced their resilience. Factors promoting resilience include altruism, seeking meaning and purpose, realistic optimism, cognitive flexibility, and building social support.¹⁶ Establishing a new system of international evacuation for the children required “out-of-the-box” thinking (cognitive flexibility), and seeing the system work bolstered the staff’s belief that they could succeed against the odds (realistic optimism). Helping the children (altruism) was the epitome of placing patients first and saving their lives (meaning and purpose). Overcoming the horrific status quo of watching little children die of preventable causes brought the team together and built pride (social support).

CONCLUSIONS

In conclusion, we documented the safe international transfer of eight acutely burned pediatric patients for specialty care, and their return home. The fact that all patients survived and that all patients and guardians returned home to Iraq is a tribute to patient selection, teaching, and support at both ends of the care program. The organizations involved must be commended for accepting this difficult challenge and flawlessly performing the technical and administrative tasks. Professionals who deploy to a combat zone must be prepared to care for injured civilians, including burn patients of all ages.¹⁷ International collaboration is one way to provide optimal care to burned children amidst the chaos and tragedy of war.

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