

# Medical Activity in the Conventional Hospitalization Unit in Kabul NATO Role 3 Hospital: A 3-Month-Long Experience

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**ABSTRACT** Introduction: The main goal of the North Atlantic Treaty Organization role 3 hospital located in Kabul is to provide comprehensive medical services to troops engaged in Afghanistan. Nevertheless, it also provides care for Afghan National Security Forces and for Afghan and non-Afghan civilians. Objectives: To describe the patients admitted to the conventional hospitalization unit over a 3-month period, between June 29 and October 1, 2012. Results: A total of 439 patients were admitted, for scheduled surgery, discharged from intensive care unit, or referred by emergency room and primary care physicians. Causes of hospitalization were diverse, particularly for nonscheduled admissions, with mainly war- and traffic-accident-related injuries for Afghan civilians and national security forces, and non-war- and non-traffic-accident-related trauma emergencies and gastroenteritis for non-Afghan patients. Suspected or confirmed cardiovascular diseases were a frequent cause of hospitalization and the leading cause of medical evacuation out of war zone for non-Afghan civilians. The patients admitted for war injuries were mainly Afghan civilians, of whom 36.6% were children and 44.7% had been injured by improvised explosive devices. Conclusion: Reasons of admission to the conventional hospitalization unit were numerous. Care provided to Afghan and non-Afghan civilians represented the main activity of this unit.

## INTRODUCTION

The medical support of the International Security Assistance Force (ISAF) mission in Afghanistan is organized on a progressive basis, to conduct treatment, evacuation, resupply, and functions essential to the maintenance of the health of the forces. Medical treatment facilities (MTFs) are designated a role number to describe their functional capability to deliver a specific level of care<sup>1,2</sup> (Table I).

There are five role 3 MTFs in Afghanistan, located in Kabul, Kandahar, Bagram, Camp Bastion, and Mazar-e-Sharif, each corresponding to a regional command and respectively led by French, U.S., U.S., U.K., and German Health service. These MTFs are coordinated by the MEDAD (Medical Advisor) of the ISAF Joint Command (MEDAD IJC) and the MEDAD of ISAF HQ (Headquarters) for the relationship with the local national health service. Kabul role 3 hospital is located at the Kabul International Airport ISAF compound. It corresponds to the Regional Command Capital, which comprises Kabul city and 14 districts of Kabul province and has an area of 4,462 km<sup>2</sup> and a population of 3,450,000. Approximately 6,000 to 8,000 NATO troops are present in the Regional Command Capital.

The main goal of the Kabul role 3 hospital is to provide comprehensive medical services to NATO troops engaged in Afghanistan. Nevertheless, it also provides care for Afghan National Security Forces (ANSF) and for Afghan and non-Afghan civilians (e.g., contractors and embassies staff).

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It includes 4 clinical units: the emergency department, an intensive care unit (ICU) with 7 beds, a conventional hospitalization unit with 30 beds, and an outpatient clinic. Its medical and surgical staff consists of 8 surgeons, 3 anesthesia providers, 1 psychiatrist, 2 specialist physicians, 3 emergency medicine physicians, and a dentist. Most of them are French. 4 Afghan physicians serve as interpreters. Radiology capabilities include computed tomography, ultrasound, and plain films. The laboratory contains a microbiology section and hematology and chemistry elements. Being located on an airport, it has access to air and ground evacuation.

Afghan and non-Afghan patients can attend the outpatient clinic (where they can meet a surgeon or a specialist physician), or be admitted for scheduled surgeries or traumatic emergencies. Only non-Afghan patients can be admitted for nontraumatic emergencies. Non-Afghan patients can come directly to the emergency department. Afghan and non-Afghan patients can be sent there by physicians working in NATO roles 1 or 2. Capabilities to receive civilian patients depend on current operations (beds reserved for potential casualties) and discharge of patients. The medical commanders have the authority to make final decisions regarding eligibility for care.

The hospital team is in continuous contact with other NATO MTFs, as well as with local hospitals, particularly Afghan National Army and Afghan National Police hospitals and with International Committee of the Red Cross center.

The conventional hospitalization unit receives scheduled and nonscheduled patients (either discharged from ICU or referred by emergency department or primary care physicians).

## METHODS

The patients hospitalized in the conventional hospitalization unit between June 29 and October 1, 2012, were prospectively included.

**TABLE I.** Description of MTFs

MTFs	Description
Role 1	Primary Care, Emergency Treatment (Resuscitation and Stabilization), Triage and Preparation for Evacuation.
Role 2	Reception and Sorting of Patients. Damage Control Resuscitation. Wider Range of Medical and Nursing Interventions and Enhanced Laboratory and Imaging Facilities. Holding of Patients Until They Can Be Returned to Duty or Further Evacuated.
Role 3	Specialist Diagnostic Resources, Specialist Surgical and Medical Capabilities, With Intensive Care, Holding and Nursing Capabilities. Final Sorting of Casualties for Transfer to Role 4 or Return to Duties.
Role 4	Full Spectrum of Definitive Medical Care. Usually Located in the Casualty's Country of Origin.

The following data were recorded for each patient:

- demographic data: age, gender, nationality, civilian or military status
- medical data: type of admission, disease, type of discharge, length of stay

**Statistical Analysis**

Statistical analysis was performed with Epi Info 3.5.1 software. For continuous variables, data are expressed as mean ± SD. Qualitative variables are expressed as percentages. Means of two independent groups were compared by the Mann–Whitney test. The combination of two qualitative criteria was tested by the  $\chi^2$ -test or by Fisher's exact test. A *p*-value ≤ 0.05 was considered as statistically significant.

**RESULTS**

**Population Baseline Characteristics (n = 439)**

439 patients (81.5% male, 18.5% female) were included. Mean age was 33.7 ± 17.1 years; 13.4% of them were aged less than 15.

54% were Afghan civilians (who were aged less than 15 in 24.9% of the cases), 25.7% ISAF soldiers, 12.8% non-Afghan civilians, and 7.5% ANSF members.

Among these 439 patients, 31 nationalities were represented. The most frequent ones were Afghan (61.5%), French (15.7%), U.S. (7.7%), Italian (1.4%), Canadian (1.4%), German (1.4%), and British (1.4%). Demographics of these patients are described in Table II. 59% of the admissions were not scheduled (2.6 admissions per day), and 41% were scheduled (1.9 per day).

**Scheduled Hospitalizations (n = 180, 41%)**

Scheduled-surgery patients were mainly Afghan civilians (95%). 71.1% of them were male, 28.9% were female. Their mean age was 35.4 ± 20.7 years. 81.1% were aged more than 15 years, 18.9% were aged 15 or less (Table III).

The most frequent surgical procedures were:

- ENT surgery (27.8%): septoplasty (10.6%), tonsillectomy (9.4%), tympanoplasty (2.8%)
- general surgery (25%): abdominal hernia surgery (8.5%), cholecystectomy (3.4%)

**TABLE II.** Demographics of the Patients Admitted in the Conventional Hospitalization Unit

	Mean Age (Years)	Proportion of Children (<15 Years Old) (%)	Proportion of Female Patients (%)
ISAF/ANSF (n = 146; 33.3%)	32.4 ± 9.4	0	4.8
ANSF (n = 33; 22.6%)	33.0 ± 10.0	0	0
ISAF (n = 113; 77.4%)	32.2 ± 9.2	0	6.2
Civilians (n = 293; 66.7%)	34.4 ± 19.8	20.1	25.3
Afghan Civilians (n = 237; 80.9%)	32.3 ± 20.7	24.9	27.4
Non-Afghan Civilians (n = 56; 19.1%)	43.3 ± 12.2	0	16.1

**TABLE III.** Scheduled and Nonscheduled Patients

	Nonscheduled Patients (n = 259, 59%)	Scheduled Patients (n = 180, 41%)
Mean Age	32.5 ± 14.0 Years (90.3% Aged More Than 15 Years; 9.7% Aged 15 or Less)	35.4 ± 20.7 years (81.1% Aged More Than 15 Years; 18.9% Aged 15 or Less)
Gender	Female: 11.2%, Male: 88.8%	Female: 28.9%, Male: 71.1%
Civilian or Military Status	ISAF/ANSF: 52.9% (ISAF: 42.5%; ANSF: 10.4%) Civilians: 47.1% (Afghan Civilians: 25.5%; Non-Afghan Civilians: 21.6%)	ISAF/ANSF: 5% (ISAF: 1.7%; ANSF: 3.3%) Civilians: 95% (Afghan Civilians: 95%; Non-Afghan Civilians: 0%)
Nationality	Afghan: 35.9% Non-Afghan: 64.1% (French: 25.9%; U.S.: 13.1%; German: 2.3%; British: 2.3%; Italian: 2.3%; Canadian: 2.3%)	Afghan: 98.3% Non-Afghan: 1.7%

- orthopedic surgery (20%): removal of osteosynthesis material (6.7%)
- ophthalmologic surgery (16.7%): cataract surgery (12.2%)
- neurosurgery (10.6%): discal hernia surgery (7.2%), cranioplasty (2.2%)

### Nonscheduled Hospitalizations (n = 259, 59%)

#### Demographics and Reasons of Admission

47.1% of the nonscheduled patients were civilians, 52.9% were military personnel. 35.9% of them were Afghans. 11.2% were female, 88.8% were male. Their mean age was 32.5 ± 14.0 years. 90.3% of the nonscheduled patients were aged more than 15 years, 9.7% were aged 15 or less (Table III).

49% of the nonscheduled patients were admitted for traumatic emergencies, mainly war-related injuries (59.8%), non-war- and non-traffic-accident-related trauma emergencies (24.4%), traffic-accident-related injuries (7.1%), and burns (2.4%) (Table IV). 66.2% of these patients were Afghan, and 18.9% of them were aged 15 years or less. 37% of them had first been hospitalized in ICU, with a mean length of stay of 3.9 ± 3.8 days. Most of the patients admitted for war- or traffic-accident-related injuries were Afghan (88.2% and 88.9%, respectively). 51% of the nonscheduled patients were admitted for nontraumatic reasons (Table V). They were mostly non-Afghan patients (93.2%), presenting with acute gastroenteritis

**TABLE IV.** Nonscheduled Trauma-Related Admissions (n = 127)

Afghan Civilians (44.9%, n = 57)
War-Related Injuries: 71.9%
Traffic-Accident-Related Injuries: 12.3%
Non-war- and Non-traffic-Accident-Related Trauma Emergencies: 10.6%
Ocular Traumas: 3.5%
Dog Bites: 1.8%
ANSF Members (21.3%, n = 27)
War-Related Injuries: 96.3%
Traffic-Accident-Related Injuries: 3.7%
Non-Afghan Civilians (8.7%, n = 11)
Non-war- and Non-traffic-Accident-Related Trauma Emergencies: 45.5%
War-Related Injuries: 18.2%
Burns: 18.2%
Ocular Traumas: 9.1%
Traffic-Accident-Related Injuries: 9.1%
ISAF Soldiers (25.2%, n = 32)
Non-war- and Non-traffic-Accident-Related Trauma Emergencies: 75%
War-Related Injuries: 21.9%
Burns: 3.1%
All Patients (n = 127)
War-Related Injuries: 59.8%
Non-war- and Non-traffic-Accident-Related Trauma Emergencies: 27.6%
Traffic-Accident-Related Injuries: 7.1%
Ocular Traumas: 2.4%
Burns: 2.4%
Dog Bites: 0.8%

**TABLE V.** Nonscheduled and Non-trauma-Related Admissions (n = 132)

Afghan Civilians (6.8%, n = 9)
Infectious Diseases: 33.3%
Hematologic Diseases: 22.2%
Pilonidal Cysts: 22.2%
Acute Renal Colic: 11.1%
Cardiovascular Symptoms or Diseases: 11.1%
ANSF Members (0%, n = 0)
Non-Afghan Civilians (34.1%, n = 45)
Acute Appendicitis: 20%
Cardiovascular Symptoms or Diseases: 15.6%
Acute Gastroenteritis: 15.6%
Urinary Tract Infections: 8.9%
Gastrointestinal Bleeding: 6.7%
Malaria: 4.4%
Others: 28.8%
ISAF Soldiers (59.1%, n = 78)
Acute Gastroenteritis: 16.7%
Psychiatric Diseases: 12.8%
Pilonidal Cysts: 9%
Acute Low-Back Pain: 9%
Cardiovascular Symptoms or Diseases: 7.7%
Acute Renal Colic: 7.7%
Acute Appendicitis: 6.4%
ENT Infectious Diseases: 5.1%
Others: 25.6%
All Patients (n = 132)
Acute Gastroenteritis: 15.2%
Acute Appendicitis: 10.6%
Cardiovascular Symptoms or Diseases: 10.6%
Other Infectious Diseases: 9%
Psychiatric Diseases: 7.6%
Pilonidal Cysts: 6.8%
Acute Renal Colic: 6.1%
Acute Low-Back Pain: 6.1%
Gastrointestinal Bleeding: 3%
Others: 25%

(16.3%), acute appendicitis (11.4%), cardiovascular symptoms or diseases (10.6%), psychiatric diseases (8.1%), acute low-back pain (6.5%), pilonidal cysts (5.7%), or acute renal colic (5.7%). Only 1.5% of them had first been hospitalized in ICU, with a mean length of stay of 1.5 ± 0.7 days.

#### Reasons and Types of Admission, Types of Discharge

The most frequent causes of admission of Afghan civilians were war-related injuries (62.1%), traffic-accident-related injuries (10.6%), and other trauma emergencies (12%). 51.5% of them were first hospitalized in ICU, 40.9% were referred by emergency room physicians. Less frequently, they were transferred from another hospital (3%), or referred by primary care physicians (4.5%). 81.8% of them were discharged home, 6.1% were transferred to another hospital, 3% were transferred to ICU, and 1.5% died. 6.1% of them were still hospitalized on October 1, 2012 (Table VI).

ANSF members were more frequently admitted for war- and traffic-accident-related injuries (96.3% and 3.7%, respectively). 51.9% of them were first hospitalized in ICU, 33.3%

**TABLE VI.** Nonscheduled Admissions: Proportion of Patients With War-Related Injuries, Type of Admission, and Type of Discharge

	Proportion of Nonscheduled Admissions (%)	Proportion of Patients With War-Related Injuries (%)	Proportion of Patients Transferred From ICU (%)	Average Length of Stay (Days)	Type of Discharge
ANSF ( <i>n</i> = 33; 22.6%)	81.8	96.3	51.9	7.6 ± 10.5	Discharged Home (11.1%) Transferred to ANSF Hospitals (81.5%) Still Hospitalized on October 1, 2012 (7.4%)
ISAF ( <i>n</i> = 113; 77.4%)	97.4	6.4	0.9	4.3 ± 3.4	Discharged Home (61.8%) Transferred to Another NATO MTF (0.9%) Medevacuated (35.5%) Unknown (1.8%)
Afghan Civilians ( <i>n</i> = 237; 80.9%)	27.9	62.1	51.5	14.7 ± 19.7	Discharged Home (81.8%) Transferred to Another NATO MTF (1.5%) Transferred to a Civilian Local Hospital (4.6%) Transferred to ICU (3%) Death (1.5%) Still Hospitalized on October 1, 2012 (6.1%) Unknown (1.5%)
Non-Afghan Civilians ( <i>n</i> = 56; 19.1%)	100	3.6	0	3.1 ± 3.0	Discharged Home (71.4%) Transferred to Another NATO MTF (3.6%) Medevacuated (25%)

were referred by emergency room physicians, and 14.8% were transferred from another hospital. 81.5% were transferred to ANSF hospitals, 11.1% discharged home, and 7.4% were still hospitalized on October 1, 2012.

The most frequent causes of admission of non-Afghan civilians were acute appendicitis (16.1%), non-war- and non-traffic-accident-related trauma emergencies (14.3%), cardiovascular symptoms or diseases (12.5%), acute gastroenteritis (12.5%), urinary tract infections (7.1%), gastrointestinal bleeding (5.4%), war-related injuries (3.6%), and traffic-accident-related injuries (1.8%). All of these patients were transferred directly from the emergency room. 71.4% of them were discharged home, 25% were medevacuated from Afghanistan, and 3.6% were transferred to other MTFs located in Afghanistan. The most frequent causes for medical evacuations were cardiovascular symptoms or diseases (35.7%) and trauma injuries (28.5%).

ISAF soldiers were more frequently admitted for non-war- and non-traffic-accident-related trauma emergencies (21.8%), acute gastroenteritis (11.8%), psychiatric diseases (9.1%), acute low-back pain (7.3%), pilonidal cysts (6.4%), war-related injuries (6.4%), acute renal colic (5.5%), cardiovascular symptoms or diseases (5.5%), and acute appendicitis (4.5%). 76.4% of them were transferred directly from the emergency room, 21.9% were referred by primary care physicians, 0.9% were transferred from another hospital, and 0.9% were transferred from ICU. 61.8% of them were finally discharged, 35.5% were medevacuated from Afghanistan, and 0.9% were transferred to other MTFs located in Afghanistan.

The most frequent reasons for medical evacuation were non-war-related injuries (41.1%) and psychiatric diseases (25.6%).

*Nonscheduled Admissions. Number of Patients and Length of Stay*

Most of the nonscheduled patients were admitted for war-related injuries. As the patients admitted for traffic-accident-related injuries, they had the longest stays in our unit (Table VII).

**War-Related Injuries (*n* = 76)**

88.2% of the patients admitted for war-related injuries were Afghan. Among them, 61.2% were civilians (*n* = 41), of whom 82.9% were male and 36.6% were aged less than 15 years.

War injuries were more frequently related to improvised explosive devices (IED) explosions (44.7%) (Table VIII), especially for Afghan patients (50.7%). No non-Afghan patient was injured by IED explosion.

55.3% of these patients were first hospitalized in ICU, with a mean length of stay of 3.9 ± 3.9 days. The patients injured by IED explosions were more frequently first admitted in ICU (61.8% vs. 50%, *p* = 0.22), where they stayed in average for 2.3 ± 3.2 days, vs. 1.8 ± 3.3 days for patients presenting with other war-related injuries (*p* = 0.37).

The most common sites of injury were limbs (68.4%), head and neck (38.2%), abdomen and pelvis (32.9%), chest (28.9%), and spine (6.6%). 5.3% of the patients had associated vascular injuries. The sites of injury were often multiple

**TABLE VII.** Nonscheduled Admissions: Number of Patients and Length of Stay

Reason of Admission	Number of Patients	Days of Care	Average Length of Stay (Days)	Minimum and Maximum Lengths of Stay (Days)
War-Related Injuries	76	885	11.6 ± 13.9	1–76
Traffic-Accident-Related Injuries	9	176	19.6 ± 30.4	1–81
Non-war- and Non-traffic-Accident-Related Trauma Emergencies	33	131	4.0 ± 3.0	1–11
Psychiatric Diseases	10	66	6.6 ± 4.9	1–17
Acute Appendicitis	14	58	4.1 ± 2.4	1–9
Acute Gastroenteritis	20	50	2.5 ± 1.3	1–6
Acute Low-Back Pain	9	48	5.3 ± 3.7	1–11
Cardiovascular Symptoms or Diseases	14	41	2.9 ± 2.2	1–8
Pilonidal Cysts	9	32	3.6 ± 1.9	1–7
Acute Renal Colic	8	25	3.1 ± 2.0	1–6

(51.3%), especially when related to IED explosions (70.6% vs. 32.5% for other war-related injuries,  $p = 0.001$ ;  $2.1 \pm 0.9$  sites in IED-related injuries vs.  $1.5 \pm 0.8$  in non-IED-related injuries,  $p = 0.002$ ).

**DISCUSSION**

The medical activity in a conventional hospitalization unit in a NATO role 3 in Afghanistan as Kabul one has never been described so far. As a matter of fact, Afghan civilians could be admitted in this unit for a wider range of diseases than what has been described before.<sup>3</sup> Moreover, unlike activity in ICUs in such MTFs,<sup>4</sup> ours took into account scheduled hospitalizations, which represented in our experience almost half of the admissions, and most of the admissions for non-traumatic reasons.

Our study shows that the admitted patients were very different, military or civilian, Afghan or non-Afghan, and children or adults (from 2 to 86 years old in our experience). They presented with a wide range of diseases, including trauma emergencies, either war related or not, very diverse surgical or medical problems, such as gastroenteritis, psychiatric diseases, heart failure, acute pulmonary embolism, infectious diseases, gastrointestinal bleeding, ocular traumas, or scheduled surgeries.

54% of the patients admitted in the conventional hospitalization unit were Afghan civilians, representing 25.5% of nonscheduled hospitalizations and 95% of scheduled ones. 25.7% of them were ISAF soldiers, 12.8% non-Afghan civilians, and 7.5% ANSF members. Consequently, 66.8% of the patients admitted in our unit were civilians.

Most of the nonscheduled Afghan patients were admitted for traumatic emergencies. War injuries were the most com-

mon, mostly related to IED explosions, and frequently involved children, as described previously.<sup>3–7</sup> IED-related injuries were usually associated with multiple and extensive wounds (involving limbs, head and neck, abdomen and pelvis, chest and spine), whose management was necessarily multidisciplinary and long, up to 76 days in our experience. Gunshot wounds were less frequent than IED-related injuries, contrarily to what had been described in Iraq.<sup>7</sup> The patients included in our study more often sustained wounds of head and neck, abdomen, pelvis and chest, compared to those described by Beitler et al,<sup>3</sup> probably because they were mainly Afghans, not wearing any body armor. Enemy combatants were kept under surveillance during their hospitalization, and then handed over to local authorities.

Traumatic emergencies in non-Afghan patients were less frequent, and mainly not war related. They were usually admitted for nontraumatic reasons, accounting for 47.5% of the nonscheduled admissions, and overall acute gastroenteritis and acute appendicitis. Suspected or confirmed cardiovascular diseases were a frequent cause of hospitalization (12.5%) and the leading cause of medical evacuation out of war zone for non-Afghan civilians. On the contrary, medical evacuation of ISAF soldiers was most frequently needed for trauma injuries or psychiatric diseases.

Lengths of stay depended highly on reasons of admission, civilian or military status, and nationality. For non-Afghan patients, diseases that did not require unavailable diagnostic or treatment facilities, and for military patients, that did not prevent them from working, were managed locally. Afghan patients stayed at least as long as they needed treatment facilities that were unavailable in Afghan hospitals, such as vacuum-assisted closure. ANSF patients were then transferred in ANSF hospitals. Nonscheduled Afghan civilian patients usually stayed longer in our unit, until they were ready for discharge, as it was seldom possible to transfer them in Afghan civilian hospitals, given the limited local medical infrastructure.<sup>8,9</sup> Some stayed longer than required by their medical status, waiting for a family member or a friend to pick them up from hospital, because they were severely disabled and unable to travel 1 or 2 days on their own to go back home.

**TABLE VIII.** Mechanism of War-Related Injuries

Mechanism	Number of Patients (%)
IED	34 (44.7)
Gunshot Wounds	29 (38.2)
Rockets	7 (9.2)
Others	6 (7.9)

The Kabul role 3 hospital was designed to provide care to NATO troops; however, the inclusion of Afghan patients and contractors added pediatric and more elderly individuals. As described by Beitler et al,<sup>3</sup> Afghan patients frequently required advanced ICU care followed by rehabilitation, and medical supply was sometimes problematic. Physicians were frequently required to treat conditions outside their primary area of expertise. Given the limited local medical infrastructure, discharge planning, transport, and placement proved very challenging. However, treating Afghan patients was very beneficial for our team, particularly because it allowed us to develop and maintain our skills in trauma evaluation and treatment.

## CONCLUSION

Although the main goal of the Kabul role 3 hospital is to provide comprehensive medical services to NATO troops engaged in Afghanistan, most of the patients admitted in its conventional hospitalization unit were Afghan and non-Afghan civilians, and many were children. They presented with a wide range of diseases, and often required a multidisciplinary management. Cooperation with other NATO MTFs and with Afghan hospitals, particularly ANSF ones, was needed to improve discharge possibilities for nonscheduled patients, so as to stay operational in case of massive casualties.

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