



Original Article

## Cas/Medevac in field area: An experience and lessons drawn

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### ABSTRACT

**Introduction:** Success of Cas/Medevac missions depends on effective coordination between all agencies involved. The focus by medical authorities on the treatment and medical care at time leads to avoidable procedural complexity. Certain lessons are drawn from the United Nations (UNs) field areas for Cas/Medevac missions/laid down procedures and recommendations made for streamlining our own procedures.

**Materials and Methods:** The data pertaining to Cas/Medevac details from IFH Level-II Malakal (UN Mission in South Sudan [UNMISS]) for January 2017 - February 2018 were collected and analyzed. Standard operating procedures (SOPs) followed in the UN field areas for Cas/Medevac missions were also studied and analyzed.

**Results and Discussion:** A total of 19 cases were air evacuated from IFH Level-II UNMISS to higher medical establishments and 11 cases from periphery to IFH Level-II in 1 year plus period. Aeromedical issues involved are discussed here with emphasis on Medevac of patient with suspicion of hollow viscus perforation/pancreatitis. Procedures and documentation followed in the UN Medevac missions are discussed and suggestions made for improving Cas/Medevac procedures in field areas. A sample of Cas/Medevac incremental information form is also suggested.

**Conclusion:** Timely evacuation of a casualty to an appropriate medical establishment can reduce mortality and morbidity significantly. Experience of Cas/Medevac missions in the UN field area is presented in this paper along with analysis and discussion on SOPs followed in the UN mission areas. Suggestions are made to refine and streamline our own Cas/Medevac procedures in field areas and theaters of conflict.

**Keywords:** Cas/Medevac, Air evacuation procedures, UN mission

### INTRODUCTION

Cas/Medevac is one of the complex chains of events that need to be implemented effectively in field operations. It involves various elements such as coordination, command and control chains, various medical echelons, transportation assets, and personnel. The United Nations (UNs) Forces are deployed over a vast and non-organized territory in challenging and often aggressive work environment, thus relying primarily on their own capabilities for emergency treatment and evacuation of diseased. The UN has well-formulated standard operating procedure (SOP) and measures in place to ensure the systematic and timely evacuation of injured and ill UN personnel during all phases and stages of deployment anywhere within the mission area. Personal experience of author during Cas/Medevac missions while being deployed in the UN Mission in South Sudan (UNMISS) is discussed in this paper along with analysis and discussion on policies and procedures followed in the UN mission areas. Certain lessons are drawn to refine our own air evacuation procedures in field areas.

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## Aims and objectives

This study aims to analyze Cas/Medevac cases during 2016–2018 in the UN mission along with the study of the UN policies and procedures with an objective to recommend measures to improve Cas/Medevac missions in our field areas.

## MATERIALS AND METHODS

The data pertaining to Cas/Medevac details from IFH Level-2 (UNMISS) for January 2017–February 2018 were collected and analyzed. Documents and manuals pertaining to policies and procedures followed in the UN field areas for Cas/Medevac missions were studied and analyzed.

## RESULTS

### Cas/Medevac cases details

A total of 19 cases were air evacuated from IFH Level-II UNMISS to higher medical establishments and 11 cases from periphery to IFH Level-II in 1 year plus period. Of 19 cases of Medevac, 9 were done under emergency Medevac category and 10 under non-emergency. Figure 1 shows the type of cases evacuated from periphery to Level-II hospital.

Figure 2 shows the total time taken for Casevac. Large number of cases took more than 3 h to reach Level-2 hospital.

Figure 3 shows the type of cases evacuated from Level-2 hospital to higher medical echelon.

Figure 4 shows the reasons for Medevac. Most of the cases were evacuated for further evaluation and management.

Figure 5 shows the total time taken for Medevac, which in most cases was close to recommended time as mentioned in standard operating procedure.

Except for one case, none of these missions ended up in any kind of unfortunate incident. One case of respiratory

distress syndrome perished before the arrival of air ambulance. Factors which resulted in success of these missions are such as (a) judicious decision-making by treating doctors and aviation medicine specialist, (b) timely approval by approving authority, (c) prompt response from aviation assets, (d) selection of suitable aircraft, (e) appropriate preparation of patients, and (f) effective coordination by coordinating agency. Nevertheless, some of the issues identified during these are (a) non-availability of airworthy oxygen cylinders, (b) non-availability of portable airworthy ventilator, (c) lengthy and time-consuming documentation process, (d) limited capability for air evacuation during night, and (e) no winching operations capability.

### UN policies and SOP for Cas/Medevac missions

Separate SOPs are followed for the UN personnel and non-UN personnel. Terminologies of Cas/Medevac are used very distinctly like Casevac for all cases getting transferred from periphery to higher medical establishment and Medevac for all casualties getting transferred from one medical establishment to another medical establishment. Similarly, the terminology emergency Medevac is used when seriously/critically ill patients are getting transferred to higher medical echelons. Non-emergency Medevac is a type of patient transfer mainly for opinion of specialist or some investigation, not available locally.

Entitled personnel for air evacuation by the UN aircraft are clearly defined in the SOP. The guiding principles are as follows:

- Medevac coordinator/Chief Medical Officer (CMO) of medical section is to be informed by medical officer/specialist/aviation medicine specialist of originating medical establishment for obtaining approval. There are separate Medevac coordinators for military personnel and the UN civilians.

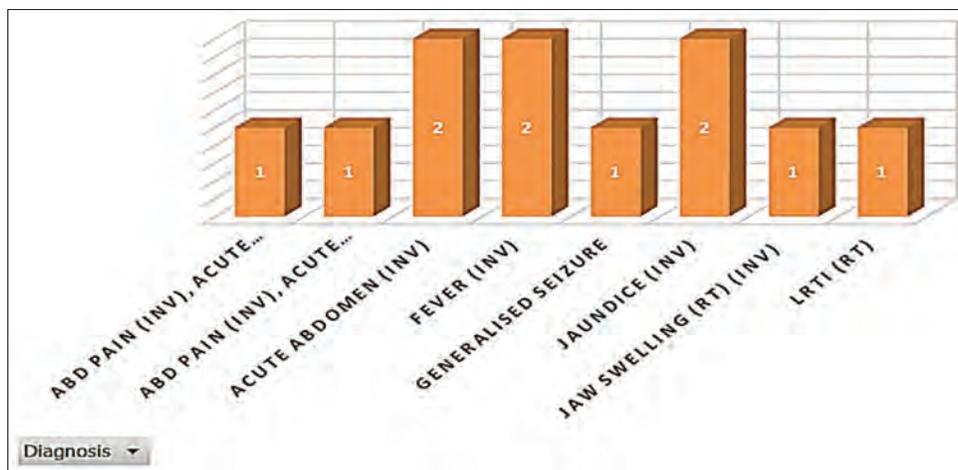


Figure 1: Diagnosis.

- b. CMO is the final approving authority in medical channel, who obtains permission from Director Mission Support (DMS) for administrative approval.
- c. Once air evacuation is approved, Medevac coordinator informs Joint Operation Centre, which coordinates the whole mission with aviation section. Regular input is given to Medevac coordinator.
- d. Medevac coordinator is the single point contact for coordinating the mission with originating medical facility and destination medical facility. He/she is responsible for giving inputs to both medical facilities regarding type of aircraft, detailed ETA/ETD, patient condition, raising movement-related documents such as MOP, look into issues of accommodation for accompanying medical staff, and arrange return of the patient back into mission area.
- e. Cas/Medevac request form, 9 Liner form with details of patient illness and present condition, flying fitness form, referral notes, special flight request (SFR) - for emergency Medevac, are mandatory medical documents along with all necessary supportive documents such as passport, VISA, immunization card, and travel documents need to be raised by originating medical centre before any Cas/Medevac mission. For emergency

cases, telephonic approval is permitted initially, but documents need to be raised later.

Provision and guidelines for providing medical escort are well laid down. For referring patient outside mission area, approval of Medical Services Division, New York, is mandatory which is obtained by DMS mission area.

**Concept of aeromedical evacuation team (AMET)**

The UN mandates that every Level-II/III field hospital should have AMET component which will primarily be responsible for carrying out air evacuations of casualties and patients. The team should be capable of providing support to Casevac missions from remote localities and assist in search and rescue operations as well. Team members should be trained in giving en route medical care on board, whenever deemed necessary. Team should be capable of handling all aeromedical equipment. In general, the AMET is composed of two medical officers (trained in air evacuation with one of them has to be an aviation medicine specialist), four paramedics called aeromedical team paramedics. All of them are mandatorily qualified to undertake air evacuation and related tasks. AMET should be capable of forming two subteams, each subteam capable of carrying Cas/Medevac mission independently.

**Concept of aeromedical evacuation module**

As per the UN policy, field hospitals need to have various aeromedical equipments as listed in the UN Contingent Owned Equipment manual. Team members of AMET need to be well proficient and trained in using such equipment whenever deemed necessary during Cas/Medevac missions. Oxygen delivery systems, Ventilator, scoop stretcher, glide stretchers, neck collar, portable defibrillator with multipara monitor, SAR bag, spider harness, head blocks, vacuum mattress with harness, etc., are the essential and critical equipment of aeromedical evacuation module.

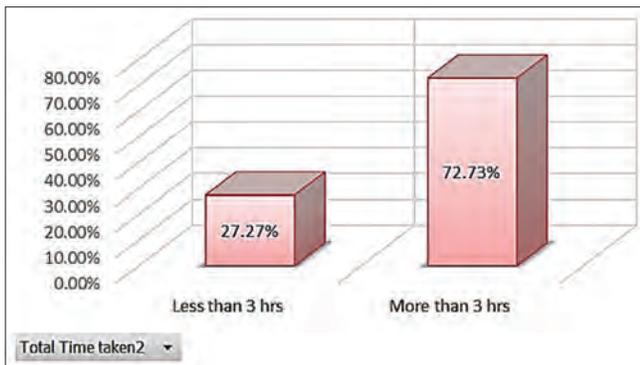


Figure 2: Total time for Casevac.

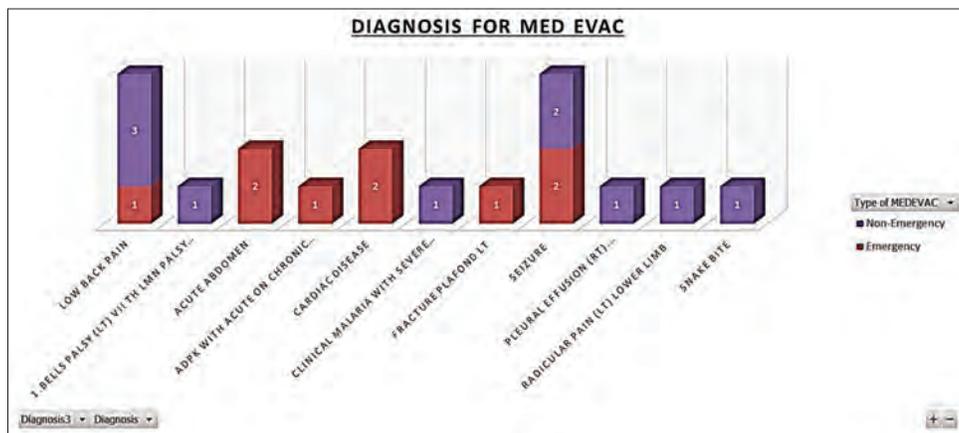


Figure 3: Types of cases evacuated from Level-2 hospital to higher medical echelon.

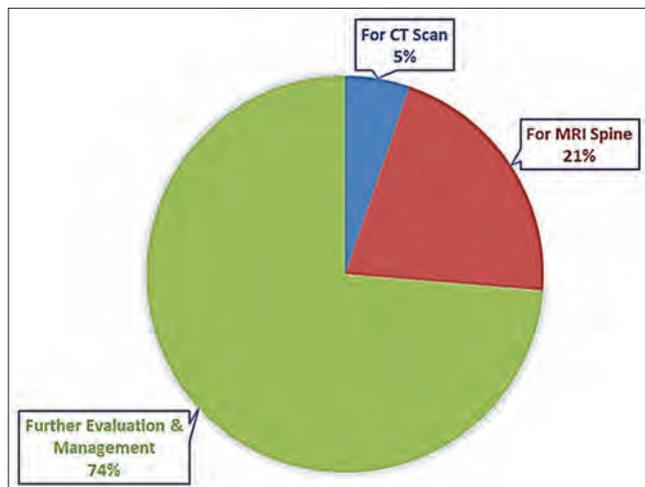


Figure 4: Reasons for Medevac.

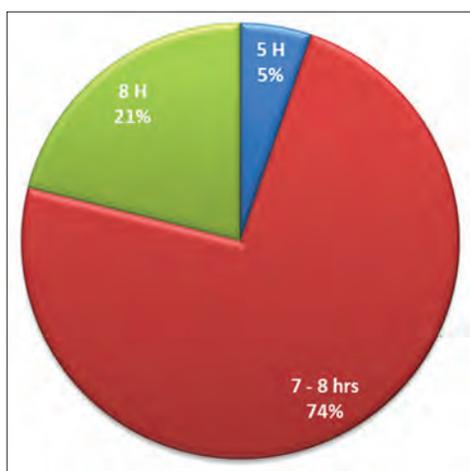


Figure 5: Medevac time (5 h, 7–8 h, and 8 h).

#### Availability of air assets

The UNMISS has both fixed-wing and rotary aircrafts for air evacuation missions. Mi-17 helicopters were mainly utilized for Casevac missions and fixed-wing aircraft such as CRJ-200/Voyageur and ATR-72/Swiftair was utilized for Medevac missions and evacuating patients out of mission area. The UN had provision of arranging air ambulance also for critically ill patients, which used to come from neighboring countries.

## DISCUSSION

Personal experience of carrying out Cas/Medevac missions in the UNs field area and UN policies/procedures is studied, analyzed, and discussed in this paper with an aim to draw a few lessons.

#### UNs SOPs

The UN has well laid down policies and procedures for carrying out Cas/Medevac missions in field areas. The

policies aim to set minimum capability standards with a description of the tangible actions required to ensure timely evacuation of any personnel from the point of injury/illness to the appropriate medical treatment facility in line with internationally recognized medical standards. The UN has multiple levels of medical establishments such as Level-1 to Level-3 and procedures are laid down in such a way that casualty can be evacuated to nearest medical establishment in an hour and farthest within 4–8 h.<sup>[1]</sup> The SOPs include pre-approved delegations of authority to expedite critical decision-making processes for Cas/Medevac operations in the mission area.<sup>[2]</sup> The SOPs are mission specific for various UN missions, which make air evacuation missions more practical, organized, and efficient. The actions to be taken by each authority are clearly demarcated and help in successful completion of these missions. The single point of contact, the Medevac Coordinator, helps in quick dissemination of critical information, appropriate decision-making in terms of approval, type of aircraft, liaison with destination medical facility, raising travel documents, etc. The terminologies such as emergency Medevac or non-emergency Medevac help in according priority to the mission but lack specificity of standard triage levels such as priority 1 or 2.<sup>[3]</sup> Suggestions have already been given to the UN authorities to consider including standard triage levels during the revision of SOPs.<sup>[4,5]</sup> The overall priority given to Cas/Medevac missions by all agencies in the UN is appreciable.

#### Transportation assets

Management of transportation assets in the UNMISS is creditable. All important field bases have one helicopter on standby mode for air evacuation operations. The strategic location of these helicopters makes it possible to evacuate the casualties from any part of South Sudan or remote location to nearest medical establishment (usually Level-1) within 1–2 h. Time to reach Level-2 facility was generally more than 3 h due to security clearance issues. Fixed-wing aircraft is available at UNMISS HQ location, which is usually utilized to transfer patient from Level-2 medical facility to Level-2 plus or Level-3 hospital. Total time taken in such cases is usually 6–8 h. Provision for arranging well-equipped air ambulance exists, depending on the criticality of patient. This is usually sanctioned for critical and lying patient. At times, difficulty was encountered in transfer of non-emergency lying cases by the UN fixed-wing aircraft as the general belief was that any lying casualty is an emergency case. Aviation branch used to stress on demanding air ambulance for all lying cases, even though UN aircraft had capability for removing seats to accommodate lying casualty. These aircrafts are also capable for conducting night Cas/Medevac operations but are generally not carried out due to security concerns. One case of snakebite needs mention here as night operations were conducted to evacuate the casualty from remote location to

Level-2 hospital. Effective coordination between medical, administrative, aviation, and security agencies as per SOP resulted in success of this particular mission.

### Documentation

The UN mandates strict documentation before Cas/Medevac missions.<sup>[2]</sup> Few documents need to be scanned and sent on mail to all concerned. No hard copies are required to be forwarded. All communications are to take place via mail, mobiles, and landline phones. To reduce paper works, it has been suggested to concerned authorities to use minimum number of forms but without compromising on critical medical information.

### AMET

Concept of AMET and aeromedical evacuation module is praiseworthy.<sup>[6]</sup> These aeromedical equipments are selected anticipating their requirement and role in Cas/Medevac missions. The issue identified is that some of these equipments were not certified to be airworthy, especially the oxygen delivery systems and ventilator. Although glide-type stretcher is a mandatory requirement for field hospital, technical support to use these stretchers with aircraft was lacking. Training of AMET members in operating these equipments is another area which requires attention. Training is responsibility of contributing nation and should be complied to. Previously, it was mandatory that all air evacuation missions should have AMET team on board. Later, after deliberations with authorities, it was agreed that decision to launch the AMET will be taken by aviation medicine specialist in consultation with CMO of the UNMISS. Requirement of standard guidelines for using AMET equipment on board was projected to the UN authorities.

### Recommendations

As the Indian Armed Forces are deployed over vast and difficult field areas, robust SOP is the need of hour for our own Cas/Medevac missions. SOPs can be tailor-made and specific to a region, depending on factors such as availability of resources, terrain, troops, type of medical facility, distance of next higher medical establishment, availability of aviation assets, and security concerns. Coordinating agencies, point of contacts, chain of command, and appointment need to be specified with delegation of duties for smooth and effective conduct of Cas/Medevac missions.

Documentation during these operations requires a relook. A comprehensive form as shown in Table 1 can be designed in each row which will give specific required information about the patient such as diagnosis, condition, fitness to fly, and any en route treatment required. The form is designed to be filled row-wise incrementally as more information becomes available. Communication channel needs to be minimized. Single point of contact can be designated to coordinate whole mission. For example, appointments such as Col Med at Div level or Corps level may be designated for this task.

On the lines of AMET concept and aeromedical evacuation module of the UN, Army Aviation Sqns/Flt MI room can be equipped with certain aeromedical equipment such as scoop stretcher, portable ventilator, portable suction machine, automated external defibrillator, and portable multipara monitor. The inventory can be designed depending on type of Sqn such as Advanced Light Helicopter (ALH) Sqn or Cheetah/Chetak Sqn. Battery operated airworthy electromedical equipment are suggested, to alleviate compatibility issue with aircraft electrical supply and to prevent malfunction during air operations. It is emphasized that aviation units should have capability of converting at least one aircraft per sector into air ambulance role within shortest

**Table 1:** Sample Cas/Medevac incremental information form.

1.	(a) Name	(b) Ser. no.	(c) Unit	(d) Age
2.	(a) Present location of patient (GR if required)	(b) Location for Air Evac (GR if required)	(c) Type of helipad. Prepared helipad/ALG/unprepared/no landing space	
3.	(a) Provisional diagnosis for Air Evac Specify, for example, surgical/medical trauma, chest pain, and pain abdomen	(b) Priority of patient P1 (save life or limb) P2 (specialized care) P3 (better prognosis) P4 (convenience)	(c) Classification 1a/1b/1c (psy.) 2a/2b/2c (lying) 3a/3b (sitting) 4 (sitting)	(d) Time of onset of present symptoms
4.	(a) MO/NA accompanying patient or MO/NA required from airbase (justify medical requirement in brief, e.g., to maintain airway, to top-up drugs)	(b) Onboard oxygen required Yes/No	(c) Special equipment requirements Splints/ bandages/drugs/monitors (subject to available and space)	

\*To be passed verbally covering as many points as possible. To be updated at formation headquarters/coordinating agency as more info is available

possible time frame. Some efforts are already underway at some ALH field Sqns in this regard but considering issues such as airworthiness of medical equipment and vetting of minor modifications of ALH, a centralized and streamlined effort with involvement of higher HQs of aviation and medical authorities is the need of hour for long-term gain.

Active involvement of aviation medicine specialist of Aviation Sqns in terms of giving critical aeromedical input during these operations would ensure success of these missions.

## CONCLUSION

Timely evacuation of a casualty to an appropriate medical establishment can reduce mortality and morbidity significantly. Experience of Cas/Medevac missions in the UN field area is presented in this paper along with analysis and discussion on SOPs followed in the UN mission areas. Suggestions are made to refine our own Cas/Medevac procedures in field areas and theaters of conflict.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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