Chapter 38

AIR TRANSPORT OF THE CRITICAL CARE PATIENT

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INTRODUCTION

Aeromedical evacuation (AE) has been undertaken in some form or other for well over a century. Currently, US Air Force (USAF) Critical Care Air Transport Teams (CCATTs) and Royal Air Force (RAF) Critical Care Air Support Teams (CCASTs) assist in carrying out the AE mission, providing the AE system's core critical care capability by delivering optimal care to severely injured or ill patients during air transport. The addition of an intensive care capability on mobility airlift aircraft has added a new dimension to the AE mission. This capability ensures that the level of medical care for critically ill and injured patients remains constant throughout the entire en route care transport system in military aircraft.

CCATTs and CCASTs are a limited, highly mobile, rapidly deployable resource available in certain situations. They are typically utilized after the patient has received essential stabilizing care by ground medical units. The teams provide continuous monitoring, ongoing resuscitation, and continuing stabilization of critical care patients during evacuation within theater or to higher roles of care.

CCATTs are utilized for a wide spectrum of operations, including humanitarian relief, disaster response, small-scale contingencies, homeland security, and major theater war.[1] CCATTs function independently of an AE team, but are required to have an AE team on the aircraft while transporting CCATT patients. CCASTs are able to operate independently of the routine AE system although the two tend to be used in parallel. CCASTs are used to transport service members and entitled civilians (diplomatic staff and defense contractors with whom a specific arrangement has been made). CCASTs are not used in the humanitarian role unless specifically tasked.[1,2]

HISTORY

AE was initially performed ad hoc, with nonmedically modified aircraft being used. The first documented episode of AE occurred during the Franco-Prussian War of 1870–1871, when observation balloons were flown out of Paris (under siege by the Germans) containing mail, high-ranking officials, and 160 casualties.[3] Fixed wing (FW), powered aircraft were first used to evacuate wounded in 1915, during the retreat of the Serbian army from Albania, and by 1919 the RAF was using modified De Havilland DH9 aircraft in Somaliland (part of modern-day Somalia). AE in a form recognizable today (using dedicated aircraft over long distances) was used in the Spanish Civil War by the German Luftwaffe.

World War I efforts led to the organization of an integrated AE system by the US Army Air Corps during World War II. This system included nurses with specific AE training serving on cargo aircraft returning from the theater of battle. In 1942 the US Army Medical Service formed the 38th Medical Air Ambulance Squadron at Fort Benning, Georgia. More than a million patients were evacuated during World War II using AE. Subsequent advances in technology have seen rotary wing (RW) assets being used, first in Burma in 1944 and more famously in Korea with "Dustoff" helicopters in the 1950s. During the Vietnam conflict, concepts of operation developed further with a more formalized system of in-flight care.[4]

By the 1990s the AE system included command and control functions, trained crews, mobile facilities for staging patients preflight, and extensive logistical support. The system could rapidly deploy, set up, and evacuate large numbers of stable casualties, but it lacked the intrinsic capability to manage critically ill casualties, instead relying on medical attendants, supplies, and equipment provided by the sending medical facility. The requirement to provide these resources was a particular challenge for small field hospitals with limited personnel, which cannot lose personnel without seriously degrading their capability.

Following Operation Desert Storm in 1990, calls were made for the addition of AE physicians and equipment capable of managing unstable patients in flight. However, the problem remained, becoming most evident in Somalia when the surge of combat casualties on October 3–4, 1993, overwhelmed the medical response capabilities, casualties accumulated, and the most critical patients could not be immediately evacuated.

The USAF is responsible for the intra- and intertheater transport of injured US military both within the theater of operations and from the theater of operation to the continental United States (CONUS). This requires the ability to provide ongoing care during long-distance flights. The system relies on available USAF aircraft that are temporarily converted into AE-capable platforms as the need arises. USAF teams involved in patient transport include the aircraft crew, AE medics, and CCATTs. Until the mid-1990s, most if not all injured patients requiring AE transport had to be relatively stable for transport. Limited medical care could be performed during transport byAE teams; for example, if a patient in Germany had an uncomplicated exploratory laparotomy, he or she would have to stay at the hospital where the surgery was performed until considered stable for transport, anywhere from 3 to 5 days postoperation. If patients required any special care or pain medicine other than oral or intermittent intravenous (IV) bolus, a medical attendant had to travel with the patients to manage their care during transport.

Early AE teams typically consisted of a mix of registered nurses and medical technicians specifically trained for air transport. A typical AE team included two nurses and three technicians; an expanded team consisted of three nurses and four technicians. These personnel varied from outpatient clinic staff to critical care staff, and the patient care abilities and comfort levels of AE team members ranged vastly. Anything other than basic care was limited by the makeup of the AE team. The typical AE transport had a patient load of anywhere from 1 to over 50 patients, depending on the types of patients, whether they were ambulatory, and the aircraft available. To support this method of AE, the holding capabilities of medical facilities in and out of theater had to be robust, which was logistically difficult to support and often not in the best interest of the patient.

During the 1980s and early 1990s, Dr Paul K Carlton Jr, a surgeon and later the USAF surgeon general, developed capability for the rapid effective stabilization and transport of significantly injured or traumatized casualties. Carlton based his method on his experience at Wiesbaden, Germany, receiving casualties from the embassy bombing in Beirut, Lebanon. In 1994 Carlton and Dr Joseph C Farmer, a medical intensivist, launched the CCATT program, consisting of teams with a critical care physician, critical care nurse, and respiratory therapist, accompanied by the supplies and equipment necessary to create a critical care environment that would move with the patient during evacuation.

Team members were specifically trained to provide specialized care in the high-altitude, extreme aircraft environment. The concept of CCATT is to manage stabilizing casualties—those who have undergone initial resuscitation but remain critically ill. A physician was included on the team to provide continuous medical decision-making, so that therapies could be titrated to the patient's condition, with new therapies started if required, and patients could continue progressing toward stability without interruption or setback for transport. Having a CCATT physician available during an AE mission also allowed better medical care for the non-CCATT patients, including pain management.

The timing of CCATT development allowed the US military healthcare system to adjust its doctrine in response to changing military strategy. During the Cold War, US forces prepared for large battles in predictable locations supported by established hospitals with the capacity to hold large numbers of casualties until they had completed convalescence and were returned to duty. After the Cold War ended, the US military became engaged in a large number of activities ranging from humanitarian and peacekeeping operations to combat. These operations often arose quickly, took place in unpredictable locations, and in some cases changed locations rapidly; establishing large-capacity hospitals whenever and wherever needed became impossible. Instead, the military needed to deploy small, high-capability, limited-holding-capacity facilities that could stabilize and evacuate casualties with far less logistic support. To accomplish this objective, medical personnel needed to be able to evacuate even unstable casualties safely, and CCATT offered that capability.

PATIENT MOVEMENT CONCEPTS

Patient evacuation from point of injury to initial role of care is the responsibility of each service component.[2,5] Casualties are evacuated through five roles of care with increasing capability, from self- and buddy-care with initial management at aid stations close to the point of injury, through advanced rehabilitative care at military and Veterans Administration medical centers in the United States.

Casualty evacuation (CASEVAC) is the movement of unregulated casualties by non-medical units aboard non-medical vehicles or aircraft, without en-route care by medical professionals. The casualty is taken from the point of injury to the most appropriate medical facility; typically Role 1 or Role 2 facilities. The CASEVAC mission may involve care under fire, and speed and security are more important than advanced en-route care. In the US military CASEVAC is overwhelmingly an Army, Marine Corps, or Navy mission.

Medical evacuation (MEDEVAC) refers to patient movement using predesignated tactical or logistics vehicles or aircraft equipped and staffed for en-route care. MEDEVAC has generally implied the use of US Army RW aircraft with specially trained medical attendants. In MEDEVAC, casualties are transported onboard medical helicopters under the care of combat medics with advanced flight training. Constituting a paramedic level of care, this capability can be used from the point of injury to a medical facility, or between facilities.

Patient movement of US military and DoD personnel through the AE system is the responsibility of the USAF.[2] USAF AE implies patient movement on fixed-wing aircraft. Deployed CCATTs are assigned to a deployed AE squadron and are responsible for patients transported via AE who require intensive care or monitoring during flight. The AE function can be categorized as tactical evacuation (TACEVAC) within a military theater of operations or strategic evacuation (STRATEVAC) between theaters of operation. STRATEVAC is primarily the domain of the USAF. The AE system refers to the regulated movement of casualties from Role 2 or Role 3 through Role 4 facilities by fixed-wing USAF aircraft.

For STRATEVAC missions, the USAF has two types of staging facilities: contingency aeromedical staging facilities (CASFs) and mobile aeromedical staging facilities (MASFs). The main difference between the two is size and the number of personnel. The MASF is smaller and designed to be highly mobile and rapidly deployable; the CASF is a more fixed facility for long-term operations. Both are positioned at major air-hubs of the AE system, serving as buffers that allow non-critical casualties to be housed, fed, and prepared for flight at a location where they can be rapidly loaded as aircraft become available. At the staging facility (CASF or MASF), basic medical care and wound care, as well as basic pain control (oral and IV bolus), are provided. Patients waiting at the air-hubs typically have minor injuries preventing them from immediately returning to duty. The CCATT (or critically injured) patients stay in the medical facility, typically in the intensive care unit, until time for transport. Aboard the aircraft, an AE crew consisting of flight nurses and medical technicians who have undergone specialized training manage the AE patients. The care given by an AE crew is limited by the large number of patients they are tasked to manage and their level of medical training. If a patient requires more care than this basic level, the sending facility has historically been responsible for providing a medical attendant during evacuation. Today, for casualties who are critically ill or injured, the AE system is augmented with a CCATT.

For United Kingdom (UK) forces, Air Publication 3394, *The Royal Air Force Aeromedical Evacuation Service,*[6] provides the details of all aspects of AE. RAF Medical Emergency Response Teams evacuate patients from point of injury to Role 2 or 3 facilities in theater. After resuscitation and damage control surgery has been performed, patients who require in-flight critical care are returned to the UK by CCAST. Those less severely injured are transported in the routine AE chain.

OPERATIONS

Team Composition

An individual CCATT consists of a physician with experience in managing critical care patients (board certified in critical care medicine, anesthesiology, cardiology, emergency medicine, or pulmonary medicine); a critical care nurse; and a cardio-pulmonary respiratory therapist. One team (physician, nurse, and respiratory therapist) can provide care for a maximum patient load of three high acuity (ie, ventilated) patients, or up to six lower-acuity (ie, nonventilated) stabilized patients.[1] A CCAST is comprised of a flight nurse trained in intensive care, a medical devices technician, a consultant anesthesiologist (and usually a trainee anesthesiologist), and a flight nursing assistant. This basic team is able to provide care for one patient requiring intensive care. Equipment is modularized and can therefore be augmented (as can the staffing) to provide care for further patients if necessary. A second intensive care nurse usually augments the CCAST, and additional equipment is routinely included to provide care for a second patient, who may be identified while the team is en route. While each team member has specific primary duties, the flexibility of individuals to perform the duties of other team members is essential for efficient team functioning.

Capabilities and Responsibilities

CCATTs and CCASTs provide capability to evacuate critical care patients requiring ongoing stabilization or advanced care during transport to the next role of care. Prior to transport, the team is responsible for preparing the critically ill patient for movement, as well as ensuring that the patient is stable enough for transport and no other major interventions are required (Exhibit 38-1). The team will then accompany the patient from the originating medical staging facility onto the aircraft and to its destination. The team continuously monitors and intervenes during flight operations as required. CCATTs and CCASTs do not routinely provide primary stabilization at point of injury and do not replace forward surgical or ground medical support team capabilities.

CCATTs function as components of the AE system and are not trained or equipped to operate as an autonomous capability; however, they have operated independently at various times. As an AE asset,

EXHIBIT 38-1

PREFLIGHT PATIENT CONSIDERATIONS

- General preferred clinical parameters prior to intra-theater trauma patient transport:
  - heart rate < 120 beats/minute
  - systolic blood pressure > 90 mm Hg
  - hematocrit > 24%
  - platelet count > 50/mm^3
  - INR < 2.0
  - pH > 7.3
  - base deficit > 5 mEq/L
  - temperature > 35°C
- Air Publication 3394 provides guidance on specific conditions for CCASTs.
- It may be in the patient's best interest to be transported to a higher role of care even if the above parameters have not all been met, based on specific patient and mission situations.
- Medical evacuation requests should include required transport equipment and provider requirements.
- The patient must be sufficiently stabilized for the anticipated duration of travel.
- The airway should be appropriately secured in ventilator-dependent patients.
- All patients should have their pain adequately managed prior to transfer with sufficient provision for likely additional requirements during transfer. In ventilator-dependent cases, this is achieved with balanced sedation and analgesia. Conscious patients may well have neuraxial blocks (either central or individual nerves) or will require appropriate alternative pain management options, eg, patient-controlled analgesia.
- IV lines, drainage devices and tubes should be fully secured and patent.
- Fasciotomies and escharotomies should be used appropriately.
- Casts must be bivalved.
- Cabin altitude restriction is required for transport of patients with decompression sickness.
- Consider a cabin altitude restriction for the following:
  - penetrating eye injuries with intraocular air
  - free air in any body cavity
  - severe pulmonary disease
  - arterial gas embolism
- A chest tube is required for pneumothorax, even if it is small and asymptomatic.
- Personal effects and all medical records (including digital copies of any radiology) should accompany the patient.
- Three litter straps should be used to secure the CCATT patient to the litter. CCASTs use a five-point harness system which is fixed to the litter.
- For critically ill patients, the CCATT or CCAST at the originating MTF should assess the patient's clinical status for flight whenever feasible.
- Patients should be transitioned to CCATT/CCAST equipment and assessed for stability in an MTF environment when feasible. Any interventions required to enhance the patient's stability for transport should be performed prior to transport.
- Determination of continuing preflight care requirements must be ongoing because a change in clinical status may require postponement or cancellation of the scheduled transport.

CCAST: Critical Care Air Support Team
CCATT: Critical Care Air Transport Team
INR: international normalized ratio
IV: intravenous
MTF: medical treatment facility
Data sources: (1) US Army Institute of Surgical Research website. Intratheater Transfer and Transport of Level II and III Critical Care Trauma Patients. Joint Theater Trauma System Clinical Practice Guideline. 2008. http://www.usaisr.amedd.army.mil/assets/cpgs/Intratheater_Transfer_and_Transport_19_Nov_2008.pdf. Accessed February 3, 2014. (2) Defence Council of the Ministry of Defence. *The Royal Air Force Aeromedical Evacuation Service.* 4th ed. London, United Kingdom; 2012. Air Publication 3394. (3) *Emergency War Surgery, 3rd United States Revision.* Washington, DC: Borden Institute; 2004:4.1–4.9.

CCATTs are involved in the full spectrum of operations to move critically injured and ill patients to the next role of care. A full AE team is always required to travel with a CCATT, even when only CCATT patients are being transported, which can at times result in an overall poor utilization of assets. CCASTs can either operate within the routine AE system or independent of it.[3,6] Missions to established operations requiring a CCAST capability usually involve combined routine and CCAST components, but if the only requirement for the mission is a CCAST capability, the team can deploy on its own. This is more frequently the case when a patient is in a location outside established operational areas (eg, a service member who has become critically ill while on a Navy ship and was evacuated to the nearest medical facility, and its capabilities are insufficient to meet the patient's ongoing needs). In enduring operations (eg, Afghanistan), a tactical CCAST may be deployed with the field hospital component to provide in-theater transport capability where, for reasons of capability or capacity, patients may need to be transferred from one hospital to another.

While the maximum patient load for the basic CCATT three-member team is three ventilator patients or six lower-acuity patients, CCATT extender teams can increase the capability to five ventilator patients or ten lower-acuity patients, based on the total patient acuity level for the mission.[1] Additional CCATTs may be required on a given mission depending on the acuity and number of patients transported. A specialized lung team based at Landstühl Regional Medical Center (Germany) is capable of transporting patients with severe lung disease requiring advanced ventilatory support, and a specialized burn team based at San Antonio Military Medical Center (Texas) is available for transporting high-percentage burn patients. However, the vast majority of the critical injured are transported via CCATT alone; both the lung and burn teams are utilized only for the most extreme cases.

There is no equivalent of the lung team in UK practice, but the standard team is capable of managing all but the most complicated patients. The equipment in one "575 (CCAST)" module is sufficient for the transfer of one patient, independent of aircraft power and oxygen, for a 24-hour period. Because the CCAST, augmented with a second flight nurse or flight nursing officer, can provide care for a maximum of two patients with a standard module of equipment, additional patients require the deployment of further augmentations to the equipment and nursing personnel, with the aim of providing one-to-one nursing care and to mitigate staff fatigue. One anesthesiologist can provide care to up to four patients.

Tasking

The patient movement requirement center (PMRC) validates the requirement for CCATT patient movement (Exhibit 38-2). CCATTs may be tasked to supplement TACEVAC or STRATEVAC. Requirements for support are based on expected casualties, location, available medical capability, and en-route care requirements. For CCASTs from the UK, the tasking authority is the Aeromedical Evacuation Co-ordination Centre (AECC) at RAF Brize Norton in Oxfordshire.[6] Tactical teams deployed in the theater of operations will be tasked locally according to need.

CCATTs may be deployed with an AE unit based on operational requirements. The request for CCATT transport should come through coordination between the originating physician, the PMRC validating flight surgeon, the CCATT theater director, and the destination accepting physician. The PMRC validating flight surgeon and CCATT theater director work with the sending, accepting, and transporting CCATT physician when planning and coordinating the patient's transfer. The transporting CCATT physician, in coordination with the CCATT theater director, makes the final determination to transport a patient after a thorough assessment that includes the patient's ability to tolerate transport and other flight logistics considerations. The CCATT theater director determines the number of CCATTs on each mission.

A similar system exists for CCAST tasking,[6] with coordination between the team referring the patient and the tasking authority (either AECC or the local medical chain of command, depending on the type of transfer)

EXHIBIT 38-2

PATIENT MOVEMENT REQUIREMENT CENTERS (AS OF JANUARY 1, 2014)

- Joint Patient Movement Requirement Center, Al Udeid Air Base, Qatar
- Global Patient Movement Requirement Center, Scott Air Force Base, Illinois
- European Command, Ramstein Air Force Base, Germany
- Pacific Command, Hickam Air Force Base, Hawaii
- Royal Air Force Aeromedical Evacuation Control Center, Brize Norton, Oxfordshire, United Kingdom

provided by an AE liaison officer. An AE coordinating officer is deployed to provide clinical direction. These two officers are supported by an AE operations officer in larger operations. Four signals are generated. Signal 1 provides only administrative details of the patient to be transferred. Signal 2 provides all the details of the care received by the patient up to the point of referral and any planned interventions. These data are covered by the legal principles of medical confidentiality. Signal 1 has a larger distribution (for administrative purposes) than Signal 2 (limited to those who need clinical information). Signal 3 is the authority (from AECC) to enplane the patient. Once the CCAST has assessed the patient, the team leader decides whether the patient is to be enplaned or not and whether any restrictions to flight (for example cabin altitude and pressurization) are necessary. Signal 4 informs AECC that the aircraft has left its point of departure and details any further clinical changes the patient has undergone, as well as any specific requirements for the onward transport of the patient from the airhead to the hospital, particularly if a police escort is required for a multivehicle convoy or a high-lift device is needed to assist egress from the aircraft. If an AE liaison officer is not deployed in that location, coordination may be directly with the referring clinician or via diplomatic staffs to AECC. For STRATEVAC missions, AECC coordinates with the receiving facility.

Rotary Wing Operations

CCATT and CCAST personnel may transport critically ill or injured patients on RW aircraft when patient requirements so dictate, and it is necessary to save life or limb. Utilization of CCATT/CCASTs on RW aircraft must be approved through the command and control agency governing the team (usually the execution arm of the air mobility division). Because of space and weight limitations on some RW aircraft, it may be necessary to pare personnel and equipment.

Fixed Wing Operations

Most AE transfers are done using FW assets. Both CCATT and CCAST are well practiced using the C-17 Globemaster and C-130 Hercules airframes due to their size and capabilities. The C-130 is the most commonly used aircraft for TACEVAC. This aircraft is capable of operating from unimproved airfields and in hostile locations. It flies at 318 knots at 20,000 feet, with a maximum ceiling of 23,000 feet. The C-130 has the capacity for up to 74 litter patients, but does not have onboard oxygen systems, mandating that oxygen to be carried onboard as a portable liquid oxygen system or a compressed gas. The electrical system provides 400 Hz AC power through specially configured outlets, limiting its direct utility for medical devices. Therefore, CCATT/CCAST missions must rely on battery power, or power provided through an electrical converter, which limits the total amperage output for medical equipment use. Lighting and environmental control systems are minimal, requiring additional measures for patient warming and visualization for patient care. Lastly, access to patients is limited to 180 degrees.

The C-17 Globemaster III has the unique quality of being an excellent aircraft for both TACEVAC and STRATEVAC. It has a speed of 450 knots at an altitude of 28,000 feet, with an unrefueled range of 2,400 nautical miles and unlimited range with aerial refueling. This range makes it useful for transoceanic missions. The C-17 can also utilize small, unimproved airfields with runways as small as 3,500 feet long and 90 feet wide. The aircraft's interior is well lit and the system of litter stanchions provides 360-degree access to critical patients. The aircraft contains built-in systems that provide medical oxygen at 50 psi and 60 Hz AC electric power through standard US outlets. Currently the workhorse in patient transport, the C-17 can be rapidly configured from use as a cargo aircraft to accommodate 36 litter patients.

Other airframes are frequently used (particularly the KC-135 by CCATTs), depending on availability and service needs. CCASTs are able to use civilian airframes for certain missions. These aircraft may be specifically designed and modified for the purpose or may be adapted to accommodate CCAST patients.

FW operations provide the advantage of greater speed and comfort than RW assets, in addition to the vastly increased range of these aircraft. Although physiological considerations (particularly the effects of ascent to altitude) must be considered when using any form of air asset, these effects are seen more with FW than with RW aircraft due to their higher operating altitude. However, FW assets, unlike RW aircraft, can be pressurized, so some of these effects can be mitigated with appropriate planning and briefing of the aircrew during the mission planning phase.

Documentation

USAF Form 3899, *Aeromedical Evacuation Patient Record*, used to direct and record en-route care, should accompany each patient to ensure that care is appropriately documented during transport. The form also serves as the legal record of patient care throughout the AE system. Copies of patient medical documentation including operative reports should be provided to the CCATT team chief.

RAF Form 7526[6] is the equivalent form for STRATEVAC, and RAF Form 7527 is used for TACEVAC. Both types of CCAST use the Medical Form 152 prescription chart. All relevant documentation is provided to the CCAST team leader. Of particular importance is an electronic copy (usually on CD-ROM) of any patient imaging.

Resupply and Patient Movement Items

Patient movement items (PMIs) should either be carried by CCATTs or made available at the next AE staging point via the PMI system. Ideally, the originating facility will provide the medications and supplies the patient requires at time of transport. To ensure the provision of necessary care in case of a diversion to an area without medical assets, a 3-day supply should be provided for intra-theater movement and a 5-day supply for inter-theater movement. However, during wartime, these medication supply levels may be adjusted based on command directives. CCASTS require a 24-hours supply of medication for STRATEVAC unless a longer flight without opportunity for resupply is anticipated. TACEVAC requirements are dictated on a patient-by-patient basis according to anticipated duration of flight.

TRAINING AND RESEARCH

Air Publication 3394[6] documents the training requirements for all CCAST personnel, including professional qualifications, AE-specific qualifications, and equipment training requirements, which differ depending on each team member's profession. All CCAST personnel are expected to take an active part in audits and research, whether designing studies, collecting data, or analyzing data. Examples of areas of active research include studies of body areas at risk of pressure sores and endotracheal microaspiration (and the safety of feeding intubated patients in flight). Other recent studies include the change in the arterial concentration of oxygen compared with the inspired concentration (the P:F ratio) during flight. Laboratory research has been done on the effects of pressure changes due to altitude on the function of ventilators.

CCATT training consists of a 12-day initial course at Wright-Patterson Air Force Base and a 12-day advanced course at the Center for Sustainment of Trauma and Readiness Skills at the University of Cincinnati. Team members must revalidate with the advanced course every 2 years.

SUMMARY

The CCATT capability was developed to provide US Air Force AE with the intrinsic capability to transport stabilizing critically ill and injured casualties. This capability permits surgical teams to remain small and mobile enough to keep pace with the military operations they support and still provide advanced resuscitation. CCATT has allowed the resource-intensive burden of postresuscitation care to remain at more fixed facilities. Since the program's inception in 1994, CCATT has performed superbly in support of peacekeeping operations and sustained this performance in support of sustained combat operations lasting for more than 13 years and producing over 10,000 critical casualties.

This capability has also performed well in manmade and natural disaster response operations, helping to remove casualties who are both most vulnerable and consume the greatest quantity of resources from the disaster area. Similarly, CCAST provides a highly trained, mobile intensive care capability for the British armed forces and entitled civilians wherever they may be serving overseas. Both services can be rapidly mobilized and deployed anywhere in the world, using the latest advances in both equipment and air transport resources.

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