INTRODUCTION:

(1) Exercise Bright Star 2002 was a Central Virginia National Disaster Medical System airhead exercise conducted at Chesterfield County Airport on September 21, 2002. These exercises test the ability of the Central Virginia National Disaster Medical System to receive and process patients delivered to Virginia by airlift in the aftermath of a major disaster (McGuire Veterans Affairs Medical Center 2000). The previous exercise in this series was conducted in 1999.

(2) This commentary is based on my exercise observations. It is not a comprehensive evaluation or record of events; rather it documents what I found significant and applicable to my research. Opinions and evaluations expressed in these notes are based on observation of and participation in both Bright Star exercises and in other exercises from 1970 to date, and on my understanding of emergency response processes.

THE EXERCISE SCENARIO AND DESIGN:

(3) The National Disaster Medical System is a partnership for the coordinated application of the resources of four Federal agencies, the Department of Defense, the Department of Veterans Affairs, the Department of Health and Human Services (through the United States Public Health Service), and the Federal Emergency Management Agency, to the resolution of medical requirements in disasters. Three key components provide the capability to assist states in the management of catastrophic casualty loads: field deployable teams that supplement state capabilities, including Disaster Medical Assistance Teams, Disaster Mortuary Operational Response Teams, and Veterinary Medical Assistance Teams; participating civilian and military hospitals; and military aeromedical evacuation. Conceptually, Disaster Medical Assistance Teams assist local emergency medical and hospital services in treatment and stabilization of patients, aeromedical transports move the patients from the disaster area to reception airfields managed by Federal Coordinating Centers, and participating hospitals that have signed agreements offering bed spaces provide for the definite care of the disaster victims (McGuire Veterans Affairs Medical Center 2000, United States 2002).

(4) The exercise scenario followed activation of the National Disaster Medical System following a catastrophic earthquake on the New Madrid fault. This scenario assumed the event would generate large numbers of patients, medical facilities in the impact area would be damaged and unable to treat all those injured, and aeromedical...
evacuation of patients would be required to distribute them to participating National Disaster Medical System hospitals (United States 2002). The scenario also assumed those transported would have been treated by surviving facilities, expedient facilities, or Disaster Medical Assistance Teams to the level required to stabilize them for transport.

(5) Patient flow from the disaster area notionally started approximately 72 hours after the disaster event. Twelve hours of warning was available prior to first air medical evacuation aircraft arrival. These factors allowed the orderly activation of the airhead plan and of the Virginia Office of Emergency Medical Services disaster resources to staff the airhead. Because these disaster units are volunteer and not kept in a state of permanent readiness, this time allowed just-in-time positioning to receive the aircraft.

PARTICIPANTS:

(6) Resources responding to support operations of the airhead included the following types of resources coordinated by the Department of Veterans Affairs Hunter Holmes McGuire Medical Center, the responsible National Disaster Medical System Federal Coordinating Center (McGuire Veterans Affairs Medical Center 2000):

Federal Coordinating Center reception team – represented by the Area Emergency Manager and an Administrative Assistant. The Federal Coordinating Center provides administrative control for patient reception at the airhead. In an actual civil disaster, this function includes a medical cache (McGuire Veterans Affairs Medical Center 2000).

Virginia Wing, Civil Air Patrol – provides a parking lot and ramp area for staging, the hangar facility used for patient reception, and access to the airfield. Civil Air Patrol personnel also provided entry control for the gates to the restricted airfield area.

Southern Baptist disaster mass feeding unit – this team has the capability of providing hot meals to disaster victims from trailers configured to serve as mobile kitchens.

(7) Resources responding to support operations of the airhead included the following types of Commonwealth of Virginia emergency medical services disaster units:

Disaster Task Forces – Task Forces are composed of 1 Basic Life Support Ambulance, 1 Advanced Life Support Ambulance, 1 Crash Truck, and 1 Quick Response Vehicle with 10 to 12 emergency medical services providers under the leadership of a Task Force Commander (Commonwealth of Virginia 1999a). Task Forces are organized regionally (within one of the state emergency medical services council regions) or locally (with one or more agencies within a jurisdiction supplying resources). Virginia currently has 12 Task Forces; elements of 5 participated in the exercise.

Coordination Teams – Coordination Teams are 5-6 person overhead teams that provide coordination, communications, resource allocation, and logistics support for deployed Task Forces. Coordination Teams are organized in broad areas of the state. Personnel from all 3 Coordination Teams participated in the exercise.
Physician Strike Team – 2 Physician Strike Teams, drawn from state designated operational medical directors, provide on scene medical direction for deployed Task Forces. The State Operational Medical Director participated in the exercise representing the West Strike Team.

Massage Therapy Strike Team – Massage Therapy Strike Teams provide physical rehabilitation for emergency workers. These teams were originally organized in coordination with the Virginia chapter of the American Massage Therapy Association. Personnel from both Massage Therapy Strike Teams participated in the exercise.

Direction and Control Strike Team – the Direction and Control Strike Team operates The Virtual Emergency Operations Center, which provides Internet based information management and communications services to support disaster medical operations. Two Team personnel participated in the exercise.

OBSERVATIONS:

(8) The operation of an airhead resembles that of a mass casualty incident, albeit a scheduled one. An aeromedical aircraft arrives at an airfield with a notional 50 patients on board, disgorges the patients, and departs, effectively simulating a patient load equivalent to a bus accident. These patients have to be retriaged after a flight that may have lasted hours, treated to the degree necessary to keep them stable until they can be moved to a hospital, and then transported to the designated facility.

(9) Previous concepts for the management of the airhead were based on the standard Virginia model for management of the Medical Group (see Figure 1) taught in Virginia’s mass casualty incident management program (Commonwealth of Virginia 1999c), and is consistent with the medical mass casualty organization suggested by the National Interagency Incident Management System and the National Fire Service Incident Management System Consortium (1996). The airhead concept envisioned the use of this standard organization as the basis for management of the airhead, with the following provisions:

(a) The Coordination Team would function as the Medical Group Supervisor.

(b) Task Forces would be assigned as integral units to serve as the Extrication, Triage, Treatment, and Transportation Units. The functions of the Extrication, Triage, and Treatment units would be somewhat modified to fit the differences between a scheduled mass casualty event and an unscheduled one. In this model the Extrication Unit removes (extricates) the patients from the aircraft, the Triage unit retriages and retags the patients with the area’s standard triage tag, the Treatment unit is concerned with stabilizing patients who have been in transit for a prolonged period (and has the appropriate Areas established by color code), and the Transportation Unit manages transportation both from the aircraft and to receiving hospitals.
(c) Triage categories would be modified to reflect the differences in the patient population. The expectation is that minimally injured patients (triaged as GREEN) would not usually be airlifted out of the disaster area. Similarly, patients requiring immediate stabilization (triaged as RED) would not normally be put aboard an aircraft. This suggests that patients airlifted would be in the YELLOW category of patients that require definitive care, but that can be sustained for some time prior to arrival at that care.

Figure 1. Virginia Standard Mass Casualty Incident Management Medical Group (with Airhead Assignments Noted)


(10) For Exercise Bright Star 2002 the Virginia mass casualty incident management model was altered as shown in Figure 2 (Commonwealth of Virginia 2002). This change had the effect of creating a more complete and self-contained incident command system organization. However, unlike the previous model, specific assignments were not made by Task Force. As a result there was no clear automatic assignment of responsibility for removal of patients from the aircraft, and some confusion as to how personnel and resources would be assigned. A secondary effect was that Coordination Team members were diverted to assignments managing Units and even area assignments within the Treatment Unit, reducing the available management cadre to operate the command and control functions of the Coordination Team. This increased the burden on the Coordination Team Commander in managing a complicated operation spread across a wide area on the airport. Finally, non-standard terminology and relationships (Groups working for Divisions, the use of Treatment Groups as opposed to Areas, etc.) created the potential for confusion.
(11) Movement of patients by ambulance from the aeromedical evacuation aircraft (in this case a West Virginia Air National Guard C-130 Hercules from Martinsburg, West Virginia) remains a resource intensive process (see Figure 3). In addition, it creates some safety concerns that would not be present on a larger airfield. The relatively small size of Chesterfield County Airport’s ramp and the narrow taxiways restricts aircraft movement. The C-130 was required to unload on a taxiway some distance from the hanger, with patients being transferred to an ambulance shuttle for transfer to the reception hanger. This procedure was tested in the 1999 Bright Star exercise and is well understood. However, with one patient per ambulance, unloading patients requires a number of ambulance cycles to and from the aircraft equal to the number of patients. As the number of available ambulances increases, the speed of this process increases, although the available access space to the aircraft, taxiway limitations, and space in front of the hanger used for patient triage, treatment, and staging for transportation would appear to impose some effective upper limit of from perhaps 15 to 20 vehicles.

Figure 3. Patient and Information Flow at the Airhead

Note: Solid lines indicate patient physical movement. Dashed lines indicate information movement.

(12) One equipment incompatibility remains the potential source of a logistical control problem. Patients move on C-130s strapped to military D ring folding litters. Because this equipment is no longer standard for civilian ambulances, ambulances that meet an incoming C-130 cannot carry these patients on either hanging mounts or benches. The expedient means adopted was to simply strap the patient on the litter to the ambulance cot for movement, an expedient that worked reasonably well. When the exercise was terminated, the litters were collected and returned to the aircraft. However, in an actual event, collection and return of litters may become a similar problem to the familiar civilian emergency medical services problem of recovering backboards at hospitals, and require some preplanning.

(13) The transfer process from aircraft to reception is subject to disruption by dispatch of the Virginia State Police Med Flight helicopter from its hangar adjacent to the Civil Air Patrol facility for air medical transport of trauma victims. Vehicle movement must stop during departure and landing of the helicopter. This has happened during both Bright Star exercises, but is a relatively short interruption.

(14) Patient sorting at the hanger was expedited by use of colored duct tape to clearly mark the limits of the physical floor areas allocated to RED, YELLOW, and GREEN patients. Each area had folding cots prepositioned to accommodate patients.
(15) Information translation between four systems of patient categorization represents a challenge. Patients arrive with military triage tags coded with standard military triage designations (minimal, expectant, etc.). They are then retriaged by emergency medical services providers and tagged with Commonwealth of Virginia standard state triage tags, which list primary complaint and a color code of RED, YELLOW, or GREEN. Finally, for entry into the standard TRANSAID tracking software and reporting to the Global Patient Movement Requirements Center (the control center for movement of patients by military airlift - located at Scott Air Force Base) (United States 2002), patient primary complaints must be translated into the thirteen standard National Disaster Medical System patient categories by expected treatment units (urology, general surgery, thoracic surgery, burn, etc.) (Commonwealth of Virginia 1999b), which in turn do not necessarily conform to hospital service organization or bed categories.

(16) Patient tracking is normally accomplished using TRANSAID, a purpose designed patient tracking software used in the Department of Veterans Affairs component of the National Disaster Medical System (Commonwealth of Virginia 1999b). In this exercise, the Federal Coordinating Center team suffered a computer failure and were unable to enter patient data. However, Direction and Control Strike Team personnel were able to use the identically formatted patient tracking function on The Virtual Emergency Operations Center to record the exercise patients. However, this effort raised two issues, one of procedure and one of penmanship.

(a) As patients move from one system to another and are tracked by a third or fourth, patient privacy issues become a concern for individual providers. As a result, there was initial reluctance on the part of the Triage and Treatment Units to pass patient data to the Federal Coordinating Center representative. This was resolved on site, but the experience of this exercise suggests the need for the inclusion of an item in the general staff briefing.

(b) When data was provided, much of it was difficult to read. In the electronic information age, inability to read handwritten notes introduces a traditional source of error into electronic data gathering. The Direction and Control Strike Team had a new member, unfamiliar with medical terminology, abbreviations, and patient categorization, pressed into unexpected service as a data entry worker. Luckily, time was available for a more experienced staff member to check her work.

(17) The Direction and Control Strike Team operated The Virtual Emergency Operations Center from the hanger. Internet connectivity was established using an aircard (a plug-in device that provides wireless connection for a lap top computer through a cellular telephone service provider). This limited where the Team could be positioned to maintain a clear line of sight to a cellular tower, and Internet access was slow, limiting both rate and volume of data transfer. However, full featured access was possible, and data posted on the site reflected the ongoing operations. In addition, the log maintained on The Virtual Emergency Operations Center was the only event log maintained on site.

(18) Personnel accountability and access control are becoming significant, linked issues in emergency response. The Office of Emergency Medical Services deployed a
new photographic identification badge system at the exercise, and each participant received an event specific badge. Data for badges was generated from the Office’s electronic database of all registered unit members, and photographs taken at the site were added to the database for use in generating new badges in future events. However, this was not a rapid process, and a setup standard drill would seem to need to be developed.

(19) A 4 person, 4 dog therapy dog team participated in the exercise as an orientation event to determine their potential usefulness as part of the responder rehabilitation process. The dogs clearly were effective in helping to alleviate stress. As the length of the line for credentialing grew, those standing in line started to complain about the process and the delays. When the dogs and handlers came over to the waiting line, complaints virtually ceased as individual responders started to interact with the dogs.

(20) However, in the after action review considerable concern was voiced by Coordination Team members as to: why the dogs were there, the potential contamination of patients, whether the dogs were adequately badged for identification case they broke free from their handlers, whether they should be allowed at an incident early on or should be used after the incident with critical incident stress management teams, and why some members of the coordination team did not know they were coming. Participants in the after action review were divided into those who felt the therapy dogs were helpful and those who thought they did not belong in the resource mix. Those favoring incorporation of the therapy dogs were males with experience in managing state level response at the Emergency Support Center and Emergency Operations Center and female Coordination Team members. Those who raised issues most strenuously were males with line fire and rescue experience, but lacking experience in state level resources management.

(21) In contrast, no one questioned the inclusion of the Massage Therapy Strike Team. Although there were initial fears when this team was organized in the Summer of 2001 that massage therapy would be met by a high giggle factor, the superb record the team established at the Pentagon in the aftermath of the attack on September 11, 2001, and their active participation in exercises and training, have made the massage therapists well accepted members of the response.

ISSUES THAT APPEAR WORTHY OF FURTHER EXAMINATION:

(22) The key resource that did not participate in the exercise was the Medical College of Virginia Hospitals. The Medical College of Virginia advanced the concept that medical on scene management should be coordinated by up to 5 emergency department or trauma physicians from the hospitals, and one of these individuals is assigned the role of Medical Incident Commander (McGuire Veterans Affairs Medical Center 2002). Credibility in and familiarity with that role would have been bolstered by participation; sophisticated medical operations with complicated timing, safety, and resource management issues require trained managers who have experience in the specific type of operation. Board certification as a trauma surgeon or an emergency department physician does not automatically provide the required skill set, a fact recognized by the
Commonwealth of Virginia’s designation of selected Operational Medical Directors with experience in the prehospital arena.

(23) Neither Bright Star exercise validated procedures for transportation of patients from the airport to area hospitals. The operational concept for the airhead uses state emergency medical services disaster units to operate the airhead because of the need to provide sustained coverage over an extended period of possibly several days (McGuire Veterans Affairs Medical Center 2000). Transportation of patients from the airhead to the appropriate hospitals for definitive care is intended to be accomplished using Richmond metropolitan area emergency medical services agencies. This would create a separate flow pattern for emergency vehicles from the roadway, through the parking lot of the Civil Air Patrol building, to an access gate and then across the parking apron to the hanger. Completing 50 patient moves would require considerable vehicular movement, movement that would seem to be made more difficult by the overall expansion of functions and permanently parked equipment at the site.

(24) Lift efficiency in moving patients from aircraft to hanger and then from hanger to definitive care would be significantly increased if ambulances were capable of easily carrying more than one patient. Although this was not a consideration in the exercise scenario, it would seem to merit consideration, especially in a high patient volume, constrained vehicle resources scenario. However, doubling the loading of an ambulance increases the requirement for loaders and unloaders at the aircraft and the hanger.

(25) Exercises to date have been under relatively benign conditions, single aircraft, in daylight, with good weather. Lighting at night to ensure safety in the hanger and parking apron area may be a significant problem. Night movement of ambulances around the air medical aircraft poses other safety issues both for people, vehicles, and the aircraft, and additional spotters and ground vehicle traffic control personnel may be required. And operations to date have been based on the hanger door being open to facilitate easy unloading and movement – inclement weather or winter operations would require the hanger door to be least partly closed and the provision of equipment or material to protect patients and staff from the environment.

(26) Finally, outbound patient exercises from a disaster in Virginia have never been conducted. Although it is commonly understood that National Disaster Medical System Disaster Medical Assistance Teams will manage that process, their failure to exercise on the airfield or as part of the existing Virginia catastrophic casualty plan (Commonwealth of Virginia 1998) does not inspire great confidence.

CONCLUSION:

(27) The Bright Star exercise series has provided excellent familiarization training for Virginia emergency medical services disaster units. Sufficient Task Forces, along with the command and control and support units, have exercised together using actual facilities and aircraft that it seems probable that patient reception could be accomplished with reasonable efficiency. It may be worthwhile to consider a 2003 tabletop exercise to
address longer-term process management, inclement weather, night operations, and patient flow to area National Disaster Medical System participating hospitals.

WORKS CITED:


