Conserving the Future Force Fighting Strength

*Findings from the Army Medical Department Transformation Workshops, 2002*

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Summary

This report details the results of the Army Medical Department Transformation Workshops (ATW) held in April, August, and November 2002, and it includes a RAND Corporation assessment and discussion of the workshop results. The purpose of these workshops was to initiate an assessment of the medical risks associated with emerging Army operational concepts and the capacity of the Army Medical Department (AMEDD) to mitigate these risks. Medical risk, discussed later in this report, is defined generally as the number, severity, and fate of casualties incurred.

Background

The Army’s transformation to a future force not only posits dramatically different equipment, it also envisions radically new ways of fighting. One future development of particular importance will be the employment of widely dispersed units moving rapidly around the battlefield. These operational concepts pose enormous challenges for the units that support the combat elements. In 1998, the AMEDD began an analytic effort to gain insight into the challenges for health service support (HSS) posed by emerging Army concepts.1 Over the next few years, AMEDD conducted two games and several work-

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1 AMEDD’s analytic effort has included broad aspects of HSS, to include homeland security, recruiting, retention, etc., in addition to combat HSS, which is the focus of this report.
shops to provide further insight into how it could best support the Army as it transformed.

From these various events, AMEDD derived some 250 issues, which they eventually winnowed down to 75. AMEDD then convened a Council of Colonels to assess and prioritize these issues. Researchers from RAND (the authors of this report) were asked to provide observations on the proceedings and conclusions. The RAND assessment concluded that the AMEDD process did not provide a sound basis for identifying and communicating the medical risks of these Army concepts.

The RAND researchers determined that the issues identified by the AMEDD process related to one of two policy issues: the level of medical risk posed and AMEDD's role in mitigating that risk. It reorganized the issues using AMEDD's Integrated Concept Teams as a construct, and assessed the issues against two sets of criteria. One set determined whether an issue was a true and relevant concern of AMEDD, while the other set prioritized the issues. RAND also recommended that AMEDD adopt a different analytical approach to identifying the degree of medical risk posed by a given issue.

We suggested that AMEDD adopt a scenario planning approach. This approach assumes that the dimensions of the distant future are, by their very nature, largely unknowable. Thus, scenario planning takes a broad approach to ensure that intervening destinations on the journey offer as many perspectives as possible.

In January 2002, the AMEDD Center and School (AMEDDC&S) asked RAND to design and conduct a series of workshops to begin an assessment of the medical risks associated with emerging Army operational concepts and the capacity of AMEDD initiatives to mitigate these risks. The underlying goals of the workshops were to identify gaps between HSS concepts for the future force and requirements and to assess the medical risk imposed by identified gaps.
AMEDD Transformation Workshops

RAND designed, organized, facilitated, and provided analytic support to the workshops, which were held in April, August, and November 2002. The three workshops were each supported by subject matter experts (SMEs). Two workshops examined combat operations of a notional future force, each supported by a different HSS structure. Eight hours of simulated combat provided the context for the workshops, generating casualty data to support the analysis of the HSS structure. The simulation was developed by the Army's Training and Doctrine command and is based on a notional future force in combat operations in 2015 (TRAC-F-TC-01-006, August 2001). In this scenario, a future force Unit of Action (battalion) is employed in a brigade shaping operation in preparation for a Unit of Employment (division) main attack. The third workshop used the more robust HSS structures from the first workshop, attempting to reorganize and reallocate these HSS assets to determine if they could better address the casualty care challenges.

The workshop teams focused on three principal issues identified by AMEDD, based in part on prior RAND research:

- Where do first responders and combat medics fit in the overall future concept for combat casualty care, and what treatment capabilities (treatment technologies and skills) will medics require to support this concept?
- What theater military medical infrastructure is necessary to support future military medical operations across the spectrum of operations?
- What are the evacuation requirements to support military operations across the spectrum of operations?

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2 The ATWs were designed as a modified version of the RAND “Day After” gaming methodology. Their goal was to present a structured problem to a team of experts to resolve by employing AMEDD's proposed future operational concepts and resources.
At the conclusion of the workshop, each team was also asked to provide three additional items of information:

- The final disposition of the casualties at the end of the workshop.
- The status of the HSS system (i.e., the availability of medical resources and services).
- The ability of the HSS system to support continued operations.

### Workshop Results

Each of the first two workshops resulted in three estimations of the outcomes for casualties generated in the scenario. Although the HSS concept used in each of these baselining workshops was different, Table S.1 shows that the outcomes were remarkably similar at the end of the simulated eight-hour battle. These results indicate that the limiting factors in the HSS concepts were probably not the different set of resources employed in the two workshops. For example, ATW I

#### Table S.1

**Mean Casualty Outcomes at H+8 hours**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>ATW I Mean (SE)</th>
<th>%</th>
<th>ATW II Mean (SE)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Killed in Action (KIA)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>15.7 (1.2)</td>
<td>29%</td>
<td>17.0 (3.1)</td>
<td>31%</td>
</tr>
<tr>
<td>Died of Wounds (DOW)</td>
<td>2.0 (1.0)</td>
<td>4%</td>
<td>3.0 (1.5)</td>
<td>6%</td>
</tr>
<tr>
<td>Returned to Duty (RTD)</td>
<td>3.7 (0.7)</td>
<td>7%</td>
<td>3.3 (0.9)</td>
<td>6%</td>
</tr>
<tr>
<td>Treated/held or awaiting treatment</td>
<td>32.7 (2.6)</td>
<td>60%</td>
<td>30.7 (1.3)</td>
<td>57%</td>
</tr>
</tbody>
</table>

SE = standard error of the mean.

<sup>a</sup> Means are calculated from results of three teams per workshop. There were 57 total casualties generated in the scenario, but the teams did not consider three USAF pilot casualties resulting from F-15 aircraft being shot down during the simulation; percentages are therefore derived from a total casualty population, N = 54.

<sup>b</sup>The casualty estimation provided by AMEDD indicated that 13 casualties were killed instantly. These and casualties whom the participants determined would die before reaching the battalion aid station (BAS) are included in the KIA values.
included a medic in each maneuver platoon while ATW II did not, yet this reduction made little, if any, difference in casualty outcomes.

At the completion of the workshop, each team reported on the status of the medical assets in support of the battalion effort. Generally, the medical system was operating at or near full capacity, especially surgical capabilities. Teams estimated that it could take an additional day or more to clear the surgical backlog. Although ground evacuation assets were not fully employed at H+8 because casualties were typically over sixty kilometers from surgical assets, air evacuation assets were near or at maximum capacity, reflecting the heavy reliance each team placed on these assets. It was also estimated that medical supplies and blood were either expended or in short supply. Significantly, the teams agreed that they would recommend an operational pause to the maneuver commander to enable the HSS system to treat existing casualties and to restore its capabilities.

**Issue Results**

**Issue 1: Where do first responders and combat medics fit in the overall future concept for combat casualty care, and what treatment capabilities (treatment technologies, level of supply, and skills) will medics require to support this concept?**

The assumed proficiency of first responders, especially of combat lifesavers (CLS), and the availability of advanced technologies to control bleeding were judged to be absolutely essential. The reliance on CLS and advanced technologies was intended to address two characteristics of the future force concept that make HSS challenging: dispersed unit operations and the absence of organic medics in maneuver platoons. These two characteristics resulted in a significant time lapse between injury and care by a medic; this time lag is especially problematic for bleeding casualties who must be treated quickly.

But some SMEs were skeptical that such an advanced level of CLS proficiency could be achieved and maintained. A related observation was that the role of CLS was unreasonably large, considering the pace of the battle and the high expectation of medical proficiency required. Nonetheless, suggested alternatives to this strategy that did
not include force structure changes included even greater CLS competence and the ability to provide substantial treatment during evacuation.

**Issue 2: What theater military medical infrastructure is necessary to support future military medical operations across the spectrum of operations?**

The teams concluded that the HSS infrastructure employed in the scenarios were generous, representing a dedication of divisional assets. Furthermore, none of these assets suffered attrition. Nevertheless, all three teams believed that this infrastructure was stretched to capacity in dealing with the casualties generated by the scenario.

Each team indicated that perfect situational awareness—based on advanced communications technologies—was a key capability because it enabled optimal allocation of medical assets. That is, knowing the location and severity of casualties in real time would allow for remote triage, resulting in the precise and appropriate allocation of both evacuation and treatment assets. Surgical capability was also critical, although many participants indicated that more was required and that this capability would be more beneficial if it were located closer to where a soldier was actually wounded.

**Issue 3: What are the evacuation requirements to support military operations across the spectrum of operations?**

Wide unit dispersion made air evacuation essential to facilitate an efficient, timely casualty evacuation. To this end, each team used air evacuation at or near full capacity. Furthermore, it was estimated this level of demand would continue for some time following the end of the scenario to evacuate the casualties resulting from those eight hours of action. Were these assets not available, the teams suggested that surgical capability would be needed even farther forward, perhaps even at the battalion aid station.

**ATW III Results**

In ATW III, team members reorganized and reallocated the more robust HSS system from ATW I in an effort to better address the combat casualties. In general, each team presented very preliminary concepts that centered on modular HSS structures designed to pro-
vide surgical capability as far forward as possible. The major observations from ATW III can be summarized in four points:

- Dispersion of units, long lines of communication (LOCs), and limited surgical capacity were the most problematic characteristics of the operations supported in the scenario.
- Timely surgical intervention is imperative. However, due to high demand, little distinction was made between the combat support hospital and the forward surgical team, resulting in a nondoctrinal use of the forward surgical team concept.
- Modular alternatives to provide far-forward surgical intervention may prove attractive with further investigation, but mobility and security are significant concerns.
- The roles of the CLS, combat arms platoon medic, and battalion aid station need to be revisited.

Conclusions

The teams agreed that the HSS systems employed during the workshops to support the transformed force had been stretched to or near their maximum capacities during the eight-hour scenario. Furthermore, this situation would affect the ability of the HSS system to support follow-on operations for some period of time, perhaps twenty-four or more hours. Reallocation of resources did not markedly improve outcomes.

The combined arms battalion in the scenario had more HSS assets available to it (i.e., all brigade assets, a combat support hospital at division, and all the aerial medical evacuation assets allocated to the division) than would normally be expected. Even in the best-case scenario of working at optimum efficiency and suffering no attrition, they were still inadequate for the task. Of further concern to workshop participants was the recognition that the operation modeled in the Army’s scenario was a relatively low-intensity, secondary-effort shaping operation.
It should be noted that the specific workshop observations and the broader implications deduced from the workshops are based on the experience of three workshops focused on a single Unit of Action (UA) battalion in a single simulation depicting shaping operations. Nevertheless, given the commonality of the findings of the three separate teams during the three workshops pertaining to the HSS system, they deserve attention.

The workshops also show the importance of simulating future force concepts and the criticality of in-depth, subject matter expert analysis in assessing the outputs of any simulation. In the case of these workshops, experts in all the components of combat casualty care tracked every casualty generated by the simulation from the point of wounding to final disposition. Thus, the teams were able to articulate credible casualty outcomes and the emerging challenges that AMEDD concepts, structures, and technologies face in supporting a postulated future force Unit of Action. The team members stressed that further simulations of additional scenarios and of evolving future force concepts should continue to ensure that the AMEDD can define for the Army the medical risks involved in future force concepts and the ability of the future HSS system to mitigate those risks. Such analysis will support the design and implementation of a health service support system that is as robust as the operational system it will support.

In addition to these results, it is likely that ongoing and recent operations in Afghanistan and Iraq will influence emerging future force concepts and structures as well as related medical requirements.