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HUMAN RESOURCES  
DIVISION

March 16, 1983



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Lieutenant General Bernhard T. Mittermeyer  
The Surgeon General  
Department of the Army

Dear General Mittermeyer:

Subject: Better Control Needed Over the Army's Automated  
Military Outpatient System (GAO/HRD-83-44)

We have completed a survey of the Automated Military Outpatient System (AMOSIST). As you know, this program uses enlisted medical corpsmen with some additional training to provide health care services to adult dependent, military retiree, and active duty outpatients at certain Army hospitals. Because of their limited medical training, these corpsmen (referred to as AMOSISTS) are not supposed to exercise medical judgment and are expected to strictly adhere to medical algorithms--step-by-step directions for diagnosing and treating certain minor illnesses.

To ensure that the algorithms are being followed, the Army's Health Service Command (HSC) requires that Army physicians conduct process audits--a comparison of the appropriate algorithms with what was actually done.

Our survey was directed toward determining the control exercised over AMOSISTS' patient treatment activities. This included assessing whether hospitals were conducting process audits and whether AMOSISTS were following the algorithms.

Our survey work was performed at McDonald Army Hospital, <sup>1</sup>/Fort Eustis, Virginia; Womack Army Hospital, Fort Bragg, North Carolina; and Brooke Army Medical Center, Fort Sam Houston,

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<sup>1</sup>/According to the Chief of HSC's Ambulatory Care Division, the McDonald Army Hospital AMOSIST program was ended shortly after our March 1982 visit.

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Texas. At each of the three hospitals, we determined whether the required process audits were being conducted and reviewed randomly selected medical records of patients treated by AMOSISTS to determine whether patients were being treated according to the algorithms.

We discussed the program with officials of the Office of the Assistant Secretary of Defense (Health Affairs), HSC, hospital commanders, and staff, and we reviewed pertinent regulations and instructions. In addition, in December 1982, we met with you and other members of the Defense Health Council to discuss our preliminary findings on the AMOSIST and other medical corpsmen programs.

Our survey showed that the required process audits were not being conducted at two of the three hospitals we visited and were not complete at the third hospital. Army physicians we spoke to said they did not believe that the audits were necessary. Hospital commanders we spoke to assumed that the audits were being conducted.

We also found that AMOSISTS at these hospitals frequently did not adhere to the algorithms in providing medical treatment. As a result, potentially more serious cases were not referred to physicians, correct drugs were not prescribed, patients were not given appropriate followup instructions, and key medical information that could have materially affected the handling of the case was not obtained. Although three HSC organizations have reported that the AMOSIST program was insufficiently controlled, the Army had not taken appropriate action to improve the program.

#### BACKGROUND

The AMOSIST program began in 1967 as a research effort at Fort Belvoir, Virginia, to develop a means to alleviate the shortage of military physicians. Medical algorithms were developed for several illnesses, such as upper respiratory tract and urinary tract infections, and incorporated into a printed manual for use in Army hospitals electing to implement the program.

AMOSISTS are given 18 weeks of training by the Army's Academy of Health Sciences. Six weeks of this is the course all Army corpsmen take, which includes training in administering medication, dressing wounds, and splinting fractures and dislocations.

Another 12 weeks of training is required for corpsmen to become AMOSISTs. Two weeks of this involve classroom training in subjects more specifically related to the AMOSIST program, and 10 weeks are spent in on-the-job training. The classroom phase covers such topics as medical terms and abbreviations, pharmacology, principles of history taking and physical exam, use of the AMOSIST manual, and use of the medical algorithms employed in the AMOSIST program. The on-the-job training phase is closely supervised by a physician.

A patient seeking care at a hospital's outpatient clinic is first evaluated by screeners who, using written guidance, make a preliminary assessment of the severity of the patient's medical problem. Screeners acquire information on the patient's complaint and condition, including temperature, blood pressure, pulse, and duration of symptoms. Depending upon this information and their written guidance, screeners refer patients directly to the emergency room, a physician, or an AMOSIST. AMOSISTs treat patients referred to them by asking questions and performing examinations outlined in the algorithms. Depending upon the answers to these questions and the examination findings, the algorithms direct AMOSISTs either to make a diagnosis and prescribe a treatment plan which may include certain specifically authorized drugs or to refer patients with potentially more serious medical problems to a physician. In this process, AMOSISTs treat patients on a one-to-one basis and are required to involve a physician only when called for by the algorithms.

The Surgeon General of the Army is responsible for ensuring the quality of all treatment provided at Army medical facilities. Various HSC agencies carry out this responsibility with regard to the AMOSIST program. Specifically, the Academy of Health Sciences trains AMOSISTs, the Division of Ambulatory Care establishes AMOSIST program guidelines and helps implement the guidelines, the Office of the Inspector General monitors compliance with the guidelines, and the Health Care Studies Division evaluates the program.

Each hospital commander is responsible for ensuring the quality of all medical services provided in his hospital. Hospital commanders electing to implement an AMOSIST program assume the responsibility for operating it within program guidelines.

As of January 1983, the Army employed 83 AMOSISTs at 13 Army hospitals. According to Army records, AMOSISTs treat an estimated 476,000 patients annually.

QUALITY ASSURANCE  
REQUIREMENTS NOT MET

To ensure that AMOSISTS follow the algorithms, HSC requires that process audits be conducted. Through these audits, program officials can determine whether AMOSISTS obtained the necessary key information, made the proper diagnosis, prescribed the correct drugs, or appropriately referred patients to physicians. Process audits were not being conducted at two of the three hospitals we reviewed and were not complete at the third hospital.

Army regulations and the Academy of Health Sciences officials consider strict adherence to medical algorithms to be essential because not following the algorithms could raise the potential for adversely affecting care rendered to patients. We found that AMOSISTS frequently did not follow the algorithms.

Process audits not conducted

The process audit, which is to be performed by physicians, consists of a comparison of the algorithm with what was actually done according to the patient's medical record. HSC officials consider process audits to be essential for motivating AMOSISTS to follow the algorithms because they serve as a reminder that adherence to the algorithms is important and is being checked regularly. These officials believe that the AMOSIST program cannot provide consistently safe care without effective process audits.

In a 1979 report, the HSC Health Care Studies Division also discussed the effect process audits have on AMOSISTS' adherence to the algorithms. This report concluded that process audits "act as a profound motivating influence--one that made them adhere to their algorithms very closely."

Despite the importance of process audits, they were not being conducted at McDonald or Womack and were not complete at Brooke. Although physicians in charge of the AMOSIST programs at McDonald and Womack reviewed medical records at random to detect obvious flaws in treatment, they told us that they did not conduct process audits because they considered such audits unnecessary. Hospital commanders, who thought the process audits were necessary, had assumed they were being conducted. At Brooke, process audits were being conducted, but they were incomplete in that they did not consider whether the drugs prescribed were the drugs directed by the algorithm. Program officials at Brooke said that the exclusion of a drug review from their process audit was an oversight and that they would include it in future audits.

AMOSISTS frequently did  
not follow algorithms

Since process audits were not being conducted or were incomplete, we reviewed a random sample of medical records to determine whether AMOSISTS were treating patients according to the

algorithms. From 8 to 34 records were reviewed at the three hospitals. Our review showed that AMOSISTS at two of the hospitals did not strictly adhere to the medical algorithms.

Army regulations require AMOSISTS to provide treatment in accordance with the algorithms. The regulation governing the activities of the Army's health care extenders, including AMOSISTS, states that the limits of AMOSIST functions are to be delineated in medical algorithms. Furthermore, the regulation outlining quality assurance programs to be used in Army hospitals requires that clinical privileges granted to AMOSISTS be strictly limited to medical care activities based on algorithms.

Academy of Health Sciences officials consider strict adherence to the algorithms to be essential because these guidelines enable AMOSISTS to spot the potentially more serious cases for referral to a physician simply by collecting basic medical information on the presence or absence of symptoms and conditions. According to these officials, adherence to the algorithms precludes AMOSISTS from having to make medical judgments for which they are not trained.

Overall, AMOSISTS made one or more errors in following the algorithms in 37 (60 percent) of the 62 cases we reviewed. More specifically, according to the patient records, AMOSISTS did not

- refer patients with potentially more serious medical problems to a physician in 17 cases (27 percent),
- prescribe the correct drugs in 24 cases (39 percent),
- advise patients as to the need to return to the clinic for reevaluation in 10 cases (16 percent), and
- obtain key medical information (such as blood pressure readings) that could have resulted in a different diagnosis or treatment, or in referral to a physician, in 24 cases (39 percent).

Our review of medical records showed that Brooke AMOSISTS provided medical treatment in complete accordance with the algorithms in 24 of 34 cases (71 percent) reviewed as compared to only 1 of 28 cases (4 percent) reviewed at the other two hospitals. The Health Care Studies Division, in its 1979 study of the AMOSIST program, also found a much higher rate of compliance with the algorithms at Brooke than at the other AMOSIST programs. Officials attribute the higher rate of compliance at Brooke to program modifications that were not made elsewhere. The modifications included simpler and easier-to-follow algorithms and a computerized process audit system which provides continuous feedback to AMOSISTS for corrective action.

PREVIOUSLY REPORTED PROBLEMS  
HAVE GONE UNCORRECTED

Problems in the AMOSIST programs have been reported for several years by three HSC organizations. Nevertheless, before January 1983, HSC had not acted to correct the problems. Officials could not explain why no action had been taken on the previous reports.

At the request of the Surgeon General, HSC's Health Care Studies Division evaluated the AMOSIST program during the period 1976 through February 1979. One objective was to assess the safety of care provided by AMOSISTS, which was addressed by determining to what extent they treated patients in accordance with the medical algorithms. The study group analyzed 282 cases treated by AMOSISTS at three Army outpatient clinics which were considered to have better controlled AMOSIST programs.

This evaluation led the division to conclude that the AMOSISTS were not providing safe medical care. Moreover, it found that AMOSISTS had made one or more serious errors in handling 274 (97 percent) of the 282 cases reviewed. In these cases, AMOSISTS either failed to refer patients to a physician as required by the algorithm or made errors that might have resulted in an additional or different diagnosis and treatment plan than was actually employed.

The Health Care Studies Division further concluded that

"\* \* \* the present findings indicate that to the extent that care provided in direct, total compliance with an algorithm is labelled as 'safe' care, very few, less than three percent, of patients treated solely by AMOSISTS received 'safely' delivered care."

Similar problems have been reported by HSC's Office of the Inspector General. Specifically, during fiscal years 1981 and 1982, that office included 14 AMOSIST programs as part of its routine hospital reviews, and found problems in the operation of 12 of them. The most frequently identified deficiencies included AMOSISTS not providing medical care in strict accordance with the algorithms and hospital officials not conducting required process audits that would have detected the deviations.

Officials of HSC's Division of Ambulatory Care advised us that they had also been reporting problems in the AMOSIST program for several years. For example, in November 1980, the division reported that AMOSISTS in one program were

"\* \* \* [treating] patients far beyond their capability, and for whom there are no algorithms (e.g., alcoholic, hypertensives, diabetics, trauma, severe gastroenteritis)."

HSC's Commanding Officer said that he recognized that the AMOSIST program was experiencing difficulties. On January 3, 1983, he directed the HSC Inspector General to make the AMOSIST program a special subject for inspection. The Inspector General was directed to determine the adequacy and effectiveness of the AMOSIST program and, specifically, whether AMOSISTS provide care in accordance with algorithms and whether hospital officials conducted the required process audits. Office of the Inspector General officials informed us that this is the first time the AMOSIST program has been selected for special emphasis.

RECOMMENDATIONS TO THE  
SURGEON GENERAL OF THE ARMY

We recommend that you emphasize to hospital commanders the need to conduct process audits as required and that strict adherence to the algorithms be maintained.

We also recommend that you direct the Health Care Studies Division to evaluate the AMOSIST program at Brooke Army Medical Center--which has experienced a much higher rate of compliance with the algorithms--to determine if modifications made at Brooke should be made to other AMOSIST programs.

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We would like to be advised of any actions taken or planned on the matters discussed in this report.

We appreciate the cooperation given to our staff during this survey.

Sincerely yours,



George D. Peck  
Group Director