

2

AD-A202 863

DTIC FILE COPY

PROPOSAL AND TESTING OF A METHODOLOGY FOR EVALUATING AN OCCUPATIONAL HEALTH PROGRAM AT A U.S. ARMY INSTALLATION

DTIC  
SELECTED  
JAN 27 1989  
S & D

A Graduate Research Project  
Submitted to the Faculty of  
Baylor University  
In Partial Fulfillment of the  
Requirements for the Degree  
of  
Master of Health Administration

DISTRIBUTION STATEMENT A  
Approved for public release  
Distribution Unlimited

by

Major Martin J. Fisher, MSC

August 1983

89 1 25 019

REPORT DOCUMENTATION PAGE

Form Approved  
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified		1b. RESTRICTIVE MARKINGS	
2a. SECURITY CLASSIFICATION AUTHORITY		3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; Distribution unlimited	
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE			
4. PERFORMING ORGANIZATION REPORT NUMBER(S) 84-88		5. MONITORING ORGANIZATION REPORT NUMBER(S)	
6a. NAME OF PERFORMING ORGANIZATION U.S. Army-Baylor University Graduate Program in Health Care	6b. OFFICE SYMBOL (if applicable) Admin/HSOA-IHC	7a. NAME OF MONITORING ORGANIZATION	
6c. ADDRESS (City, State, and ZIP Code) Ft Sam Houston, TX 78234-6100		7b. ADDRESS (City, State, and ZIP Code)	
8a. NAME OF FUNDING/SPONSORING ORGANIZATION	8b. OFFICE SYMBOL (if applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8c. ADDRESS (City, State, and ZIP Code)		10. SOURCE OF FUNDING NUMBERS	
		PROGRAM ELEMENT NO.	PROJECT NO.
		TASK NO.	WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) Proposal and Testing of a Methodology for Evaluating an Occupational Health Program at a U.S. Army Installation			
12. PERSONAL AUTHOR(S) MAJ Martin J. Fisher, MSC			
13a. TYPE OF REPORT Study	13b. TIME COVERED FROM Jul 82 TO Aug 83	14. DATE OF REPORT (Year, Month, Day) 1983 August	15. PAGE COUNT 90
16. SUPPLEMENTARY NOTATION			
17. COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SUB-GROUP	
		Health Care, Occupational Health	
19. ABSTRACT (Continue on reverse if necessary and identify by block number) This study was designed to develop explicit and effective criteria for assessing compliance with pre-determined standards related to the Army Occupational Health Program. The author employed a face-to-face panel technique to develop criteria and measurement tools at two different Army installations. Discrepancies in the criteria and measurement tools between the two panels showed weaknesses in the evaluation methodology. The author also felt that the method would be impractical because the methodology was too time consuming. <i>Keywords: Medical Services, Military hygiene. (SDW)</i>			
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS		21. ABSTRACT SECURITY CLASSIFICATION	
22a. NAME OF RESPONSIBLE INDIVIDUAL Lawrence M. Leahy, MAJ, MS		22b. TELEPHONE (Include Area Code) (512) 221-6345/2324	22c. OFFICE SYMBOL HSOA-IHC

89 1 25 019

TABLE OF CONTENTS

ACKNOWLEDGEMENTS . . . . . iv

LIST OF TABLES . . . . . v

Chapter

I. INTRODUCTION . . . . . 1

    Conditions Which Prompted This Study . . . . . 1

    The Problem . . . . . 2

    Factors Influencing The Proposed Methodology To Be Tested . . . . . 2

    A Review of The Literature . . . . . 6

    Objectives of This Study . . . . . 15

    Criteria For Feasible Solutions . . . . . 16

    Definitions . . . . . 16

    Assumptions . . . . . 16

    Research Methodology . . . . . 18

    Footnotes . . . . . 20

II. DISCUSSION . . . . . 24

    Rationale for the Evaluation Methodology Selected . . . . . 24

    Selection of Performance Standards . . . . . 24

    Rationale for Selection of Seneca Army Depot as a Site for this  
    Study . . . . . 26

    Conduct of the Research at Seneca Army Depot . . . . . 27

    Results of the Research Conducted at Seneca Army Depot . . . . . 30

    Conduct of the Research at the U.S. Army Environmental Hygiene  
    Agency . . . . . 43

    Results of the Research Conducted at the U.S. Army Environmental  
    Hygiene Agency . . . . . 44

    Footnotes . . . . . 53

III. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS . . . . . 54

    Summary . . . . . 54

    Conclusions . . . . . 54

    Recommendations . . . . . 56

APPENDIX

    A. ARMY OCCUPATIONAL HEALTH PROGRAM ELEMENTS . . . . . 58

    B. LETTER OF INSTRUCTION TO CRITERIA DEVELOPMENT PANEL  
    PARTICIPANTS, U.S. ARMY HEALTH CLINIC, SENECA ARMY  
    DEPOT, ROMULUS, NEW YORK . . . . . 60

    C. CRITERIA DEVELOPMENT AND OCCUPATIONAL HEALTH PROGRAM  
    EVALUATION QUESTIONNAIRE . . . . . 69

D. LETTER OF INSTRUCTION TO CRITERIA DEVELOPMENT PANEL  
 PARTICIPANTS, U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY,  
 ABERDEEN PROVING GROUND, MARYLAND . . . . . 71

BIBLIOGRAPHY . . . . . 81

Accession For	
NTIS CRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution	
Availability Codes	
Dist	Availability or Special
A-1	



## ACKNOWLEDGEMENTS

The writer wishes to thank several persons for their support and cooperation during the conduct of this project. First, LTC (P) David E. Cundiff, MSC, Executive Officer, Fort Devens MEDDAC, for approving the travel time and funding which were necessary for research completion. Second, COL Bruce A. Dalton, MC, Occupational Medicine Resident, U.S. Army Environmental Hygiene Agency, for providing technical guidance and laying the groundwork for a portion of the study. Finally, the following individuals, who took time from their extremely busy schedules to serve on criteria development panels:

Dr. Michael P. Brazaitis, M.D., CPT, MC  
Ms. Cynthia Houston-Brickey, R.N., M.P.H.  
Ms. Velma C. Radka, R.N.  
Ms. Janet M. Ruff, R.N., M.P.H.  
Ms. Patricia R. Spooner, R.N.  
Dr. Richard W. Tezak, M.D., M.P.H., MAJ, MC

LIST OF TABLES

TABLE	Page
1. Selected Occupational Health Program Performance Standards . . . . .	25
2. Consolidated Criteria List and Measurement Tools Selected to Assess Compliance with the Standard Applicable to Program Sub-Element "Preemployment Physical Examinations" and Problems/Shortcomings Identified During the Compliance Verification Process at Seneca Army Depot . . . . .	31
3. Consolidated Criteria List and Measurement Tools Selected to Assess Compliance with the Standard Applicable to Program Element "Health Education and Counseling" and Problems/Shortcomings Identified During the Compliance Verification Process at Seneca Army Depot . . . . .	34
4. Consolidated Criteria List and Measurement Tools Selected to Assess Compliance with the Standard Applicable to Program Element "Pregnancy Surveillance Program" and Problems/Shortcomings Identified During the Compliance Verification Process at Seneca Army Depot . . . . .	37
5. Summary of Results from Compliance Verification Process . . . . .	41
6. Consolidated Criteria List and Measurement Tools Selected to Assess Compliance with the Standard Applicable to Program Sub-Element "Preemployment Physical Examinations" by Panel of Experts, U.S. Army Environmental Hygiene Agency . . . . .	45
7. Consolidated Criteria List and Measurement Tools Selected to Assess Compliance with the Standard Applicable to Program Element "Health Education and Counseling" by Panel of Experts, U.S. Army Environmental Hygiene Agency . . . . .	47
8. Consolidated Criteria List and Measurement Tools Selected to Assess Compliance with the Standard Applicable to Program Element "Pregnancy Surveillance Program" by Panel of Experts, U.S. Army Environmental Hygiene Agency . . . . .	49
9. Comparison of Criteria Lists - SEAD Versus AEHA . . . . .	44

## I. INTRODUCTION

### Conditions Which Prompted this Study

On December 29, 1970, Public Law 91-596, the Williams-Steiger Occupational Safety and Health Act (OSHA) was signed into law by the President of the United States. Under its provisions, employers are required to provide a safe and healthful working environment for all employees. Since the Act's passage, a number of subsequent Federal directives and standards which mandate establishment of an occupational safety and health program for Federal employees and define the program's scope have been issued. Army Regulation (AR) 40-5, Health and Environment, describes the Army Occupational Health Program. The program is applicable to all Department of the Army commands and includes the following:

1. Evaluation and control of the health hazards and physical stresses of the work environment and promotion of necessary measures to assure the safety of workers within that environment;
2. Provision of initial and periodic medical examinations related to job hazards and physical requirements to assure that all workers are physically, mentally and psychologically suited to their work;
3. Provision of medical care for occupational illnesses and injuries, and emergency and limited palliative care for nonoccupational illnesses and injuries with referral to the workers' personal physicians;
4. Provision of job-related and general health counseling and education;
5. Conduct of health maintenance activities such as job-related surveillance of pregnant employees and personnel with chronic disabilities, medical/nursing support of the sickness absence control program, immunization programs, and voluntary health examinations or disease screening programs;
6. Maintenance of medical records and reports;
7. Analysis and interpretation of statistics and services.<sup>1</sup>

Each Army installation is required to have an ongoing occupational health

program for assigned civilian and military personnel. Installation programs are evaluated for compliance with legal and regulatory requirements by personnel assigned to the U.S. Army Environmental Hygiene Agency (USAEHA) approximately every three years. A detailed Occupational Health Program Survey Questionnaire is sent to each installation for completion in advance of the survey. The data which is provided is subsequently reviewed on-site. Several survey team members have expressed a degree of dissatisfaction with the current evaluation methodology employed, which is felt to be somewhat subjective.<sup>2</sup> A better evaluation technique has not, however, been developed.

A related situation exists with respect to occupational health program evaluation at the installation level in the interim between USAEHA surveys. At the present time, no formal evaluation is being conducted by medical personnel at Fort Devens or at any of the five health clinics on Army installations in New York and Massachusetts for which the Fort Devens MEDDAC is responsible. The lack of an established occupational health program evaluation methodology at Fort Devens was revealed during an August, 1982 occupational health survey of the installation.<sup>3</sup>

### The Problem

The problem addressed by this study is to test a proposed methodology for evaluating an occupational health program at a U.S. Army installation.

### Factors Influencing the Proposed Methodology to be Tested

#### Army Occupational Health Program factors

The content of Army-published documents which pertain to the Army Occupational Health Program and the ways in which installation occupational health programs are normally administered have greatly impacted upon the selection of the test methodology. AR 40-5 charges the commander of the medical

facility which provides medical support to each installation with the responsibility for providing technical guidance and direction to the installation occupational health program. This task is generally delegated to the Medical Department Activity (MEDDAC) Preventive Medicine Activity.<sup>4</sup>

Health Services Command (HSC) Regulation 11-4 specifically directs the Chief, Preventive Medicine Activity, to assess the overall occupational health program.<sup>5</sup> On an installation which is served by a health clinic that is subordinate to a MEDDAC located elsewhere, the health clinic staff performs most occupational health program functions. Primary responsibility for program evaluation in this setting rests with the occupational health physician and/or occupational health nurse.<sup>6</sup>

USAEHA Technical Guide (TG) 124, Occupational Health Program Manual, states that "Ongoing and periodic (later referred to as annual) evaluation is essential to having an effective and efficient (occupational health) service."<sup>7</sup> The guide also points out the primary purposes of program evaluation, which are the documentation of what is being accomplished, any unmet needs, and program weaknesses. Evaluation techniques to be employed are not specified; however, what is emphasized is the need to assess compliance with provisions of the overall Army Occupational Health Program and performance relative to specific installation programs. The guide also discusses the necessity for development of objectives and standards against which program performance should be measured and the need to develop criteria and identify data elements to facilitate the measurement process. The desirability for program evaluation to be a coordinated activity among occupational health service staff members, including occupational health physicians and nurses, is additionally stressed.<sup>8</sup>

The occupational health nurse plays a key role in the evaluation process. The duties of this individual often include the maintenance of lists of

installation personnel potentially exposed to specific occupational health hazards, conduct of many routine health screening examinations, organization and presentation of health education programs, and compilation of occupational illness and injury data. USAEHA TG-005, Occupational Health Nursing Responsibilities, lists program evaluation responsibilities which the professional nurse can assume in order to contribute most effectively to the accomplishment of the occupational health service mission. These are stated as follows:

1. Evaluates health programs, nursing procedures, and responsibilities and recommends methods that will increase effectiveness;
2. Conducts periodic audit of medical and nursing programs, procedures, and records, and recommends changes as indicated.<sup>9</sup>

The Army Occupational Health Program is broken down into distinct activities or program elements. These may be required by law and/or regulation or are considered desirable for implementation as resources permit. A listing of Army Occupational Health Program Elements is presented in Appendix A. The organization of overall program requirements by element is useful to the proposed evaluation process.

#### Quality assurance factors

In April 1979, the Board of Commissioners of the Joint Commission on Accreditation of Hospitals (JCAH) approved a new Quality Assurance (QA) standard. The new standard was first published in the 1981 JCAH Accreditation Manual for hospitals and became effective on January 1st of that year. Implementation of the standard is now widespread throughout the hospital industry.

The objective of the JCAH in formulating and requiring hospital compliance

with the quality assurance standard is the enhancement of patient care. The standard mandates that hospitals develop mechanisms for assessing patient care activities. The wording of the standard is intentionally broad so as not to limit innovation in the choice of assessment alternatives. It is clear, however, that any assessment methodology which is selected must focus on the correction of patient care problems which are identified by comparing actual performance with written, pre-established, clinically valid criteria.<sup>10</sup> These are defined as predetermined elements against which aspects of the quality of medical service may be compared.<sup>11</sup>

The scope of JCAH quality assurance interest encompasses patient care activities in both inpatient and ambulatory care settings. Hospital quality assurance programs are currently being closely scrutinized by JCAH surveyors. Because of the emphasis which is currently being placed on the proper conduct of quality assurance activities by the JCAH, the subject is of special interest to the Army Surgeon General. Health Services Command Inspector General (IG) teams, like JCAH surveyors, therefore look at quality assurance quite closely during their annual general inspections of Army MEDDACS, medical centers, and subordinate health clinics. It is during these inspections that performance with respect to the installation occupational health program is most likely to be reviewed. At many installation health clinics where occupational health activities represent the bulk of the patient care workload, quality assurance and occupational health may become closely intertwined.

#### Linking occupational health program evaluation with quality assurance

Much commonality of purpose exists, then, in conducting installation occupational health program evaluation and quality of care assessment. The guidance which has been published for accomplishing each of these reviews is likewise similar.

Considerable overlap of the two programs may, in fact, exist. It is therefore logical to apply concepts and processes which have been used for assessing quality of care to the evaluation of an installation occupational health program.

### A Review of the Literature

#### Occupational health and quality assessment

A relationship between quality assessment and program evaluation is, according to Donabedian, established when a given program includes the provision of personal health services.<sup>12</sup> If a program encompasses other functions as well, then quality assessment becomes part of overall program evaluation. The importance of quality assessment relative to overall program evaluation is increased in situations where the medical authority is considered to be responsible for a program involving a specified enrolled population. In this situation, the distinction between the two concepts may become somewhat blurred.<sup>13</sup>

There is little in the literature which specifically discusses quality assurance activities in relation to occupational health. One exception is an editorial published in the April 1978, Journal of Occupational Medicine, in which Dr. John H. Mitchell presents a case for the performance of ambulatory medical audits of the quality of occupational medical care. He argues that a need exists to identify delivery of occupational medical care problems and initiate corrective actions.<sup>14</sup>

#### Occupational health program evaluation

Several articles have addressed methodologies for occupational health program evaluation. Davis discussed an audit procedure of use to an organization which desires an objective appraisal of its occupational health activities.<sup>15</sup> Krieger, in an unpublished manuscript, proposed a corporate occupational medicine

audit methodology which is based on an evaluation of discrete program elements. His concept called for the generation of performance criteria and measurement tools, but did not go into detail on how these would be developed. The need for quality of care assessment was recognized, with quality assurance being considered as a distinct activity in the overall audit process.<sup>16</sup>

The most exhaustive work to date on occupational health program evaluation was performed by a University of Cincinnati group in 1975. Their efforts culminated in the publication of the document, Standards, Interpretations, and Audit Criteria for Performance of Occupational Health Programs, the contents of which are used as a basis for occupational health program accreditation by the Occupational Health Safety Program Accreditation Commission (OHSPAC). Broad, goal-oriented standards describing optimally desired levels of performance for various program areas were developed and validated along with assessment criteria formatted as audit questions. The validation process encompassed a thorough review by numerous occupational health experts in order to ensure professional acceptability. Although the document is considered to be useful in the occupational health program assessment process, its authors acknowledge that portions of the document may not be applicable to all programs due to differences in program size or activities.<sup>17,18</sup>

#### Quality assessment concepts

The JCAH quality assurance standard links the quality of performance with the degree of adherence to pre-established, or explicit criteria of care. These are commonly divided into three major categories. "Structural" criteria are those which focus on the tools and resources which providers have at their disposal and the settings in which care is delivered.<sup>19</sup> Process criteria examine the practice of medicine, or patient management activities.<sup>20</sup> "Outcome" criteria concern themselves with the end result of care, or what actually happens to the

patient.<sup>21</sup> Strengths and weaknesses of each of the above categories have been extensively reviewed in the literature. While a general consensus exists that quality assessment should, insofar as possible, be related to the measurement of the results of care, outcome-related data is often available only in the inpatient setting. Information necessary to evaluate ambulatory patient care from an outcome standpoint is generally not recorded in patient charts. For this and other reasons, most ambulatory evaluation methodologies are process-oriented.

Donabedian defends the use of process criteria in quality assessment on the basis that certain procedures used in specified situations are clearly associated with good results.<sup>22</sup> Griffith is somewhat less supportive but does concede that process criteria do identify specific events which can be studied and corrected.<sup>23</sup> Neither is particularly satisfied with the use of structural criteria because of insufficient knowledge about relationships between structure and performance.<sup>24,25</sup>

The assessment of preventive health services in the ambulatory care setting must, in the absence of observable or measureable changes in health status, be accomplished largely through the use of criteria relating to structure or process. The few articles on this subject which appear in the literature concern themselves primarily with maternal and child care evaluation. In each case, preventive assessment criteria were heavily process-oriented.<sup>26,27,28</sup> In one study, participants who were asked to support their selections of criteria with documentation from the literature offered few references, a finding which indicates a lack of research to establish the value of many procedures customarily performed during well-child visits.<sup>29</sup>

### Explicit versus implicit criteria

Considerable research has been devoted to the development of medical care assessment criteria. These may be categorized as implicit or explicit. Implicit criteria are subjective elements related to the appropriateness of care which are based on the personal opinion of each assessor. Explicit criteria, on the other hand, are elements of evaluation which are agreed upon by a group and set down on paper prior to the conduct of the assessment process. Lists of explicit criteria have been formulated from the literature and by committees of individuals.

The advantages and limitations to the application of implicit and explicit criteria in medical care quality assessment have been widely discussed.<sup>30,31,32,33</sup> Comments have focused upon issues of reliability, validity, ease of assessment conduct, and the desirability for fairness, consistency, and measureability. The current trend, as evidenced by the wording of the JCAH Quality Assurance Standard and the definition of the term "criteria" published in the PSRO Program Manual (and previously included herein) is clearly toward the use of explicit criteria as quality of care screening devices. The U.S. Army has followed the lead of the JCAH in requiring the use of predetermined, written criteria in patient care assessment.<sup>34</sup>

### Process criteria validity and reliability

The validity and reliability of process criteria are of paramount importance to those seeking to devise appropriate quality of care screening elements. Validity concerns itself with the relevance of criterion performance to outcome, while reliability measures the extent of agreement on the importance of a given criterion to quality. Unfortunately, experimental evidence verifying the validity of process criteria is often lacking. Therefore, criteria acceptability must, in many cases, be based on a consensus among knowledgeable

individuals as to relevance.

A number of studies conducted to determine process criteria validity appear in the literature. Investigations generally consisted of two parts: initial development of diagnosis-specific assessment criteria having the greatest consensual agreement (reliability) among experts, and subsequent comparison of these group developed assessment criteria to published data correlating process and outcome or to observed patient outcomes.<sup>35,36,37</sup> In one of these studies, Dershewitz et al. identified validation data from the literature for ten of the thirteen peptic ulcer diagnostic criteria most often cited in predeveloped listings compiled by various professional groups.<sup>38</sup> Hastings, et al. constructed and validated a checklist used in the performance of peer review of ambulatory medical records. A checklist of criteria weighted according to perceived importance was first developed by a panel of academic clinicians. A series of identical medical records were then reviewed against the checklist by different individuals in order to establish reviewer reliability. Validity was tested by reexamination of ten jail inmate patients by a specially trained reevaluation physician who, using the checklist, evaluated the quality of care which these patients had originally received at an earlier sick call.<sup>39</sup>

McAuliffe, in a critique of process-outcome correlation studies, notes additional investigation results which appear to validate process data.<sup>40</sup> He also brings to light flaws in the conduct of five studies in which little relationship was found between process and outcome.<sup>41</sup> He concludes, however, that very little is currently known about the validity of methods being used to assess quality of care.<sup>42</sup>

Studies of reliability have focused on measuring consensus among professionals as to what criteria are important to quality of care assessment

and their relative levels of importance. As previously stated, the degree of consensus is often accepted as evidence of the relationship between process and outcome. Donebedian notes that Brook, in a study comparing five methods of peer review, reported a high degree of correlation between sets of criteria endorsed by at least two-thirds of separate groups of specialists and generalists.<sup>43</sup> Hare and Barnoon echo this finding in reporting high levels of agreement between academic and practicing internists on the relative importance of criteria developed for six categories of care.<sup>44</sup> In yet another study, Osborne and Thompson report a significant concordance among academicians and practitioners on the relevance of criteria pertaining to seven pediatric health problem areas. It should be noted that the greatest disagreement in relevance ratings occurred in lists of criteria developed to assess well child care in four distinct pediatric age groupings.<sup>45</sup>

Study results reported above should not be accepted as conclusive evidence of universal concordance on criteria among professionals of the same specialty. Some significant differences of opinion did, in fact, occur, but these tended to be overshadowed by overall findings. It is difficult, then, to proffer any firm conclusions on the matter of reliability.

#### Other characteristics of explicit process criteria

In addition to the desirability for criteria to be considered valid (often an assumption based on the results of reliability studies), several other qualities of criteria should be considered during the development process. Army Regulation 40-66 mandates that criteria be realistic, objective, and measureable. The term "realistic" addresses the need for feasibility in meeting a given criterion. For example, it is useless to establish a criterion calling for a computer analysis of data if a computer is not available to perform this

function. Objectivity infers precision and detail; a criterion should be relatively immune to varying interpretation by different individuals.<sup>46</sup> Merry suggests that the most desirable criterion is the one that requires an individual to exercise very little judgement and answer its implicit question with a relatively straight forward yes or no response.<sup>47</sup> Measureability is defined as the requirement for the answer to a given criterion's implicit question to be verifiable by observation, consultation, or documentation.

Acceptability of criteria overlaps with validity and infers the existence of a consensus between knowledgeable individuals as to the value of a given criterion. A criterion may be considered to be valid, but it may duplicate another criterion in the same list, be considered low in importance, or may possess some other characteristic which would deem it to be unacceptable as an assessment element.

#### Techniques for criteria derivation

The collective opinion of a group of experts is often sought through consultation techniques which facilitate the formation of a group consensus. This goal may be accomplished by questioning group members separately or via a face-to-face panel format.

The Delphi technique is well known to researchers seeking to reduce variation in expert opinion. Its application to criteria derivation involves the modification of criteria lists based on mailed feedback received from separate panelists. In two studies employing the Delphi technique, previously established criteria lists were originally submitted for first-round panelist assessment. After initial consolidation of first-round results by researchers, each panelist was provided with a summary of the group response and was afforded the opportunity to alter his opinion. In each case, opinion modification resulting from the second-round mailing was minimal.<sup>48,49,50,51</sup>

A face-to-face group process which has seen application in the quality assurance arena is the nominal group technique. This method was originally developed by Van de Ven and Delbecq as a tool for fact-finding and information generation.<sup>52</sup> Its adaptation to the derivation of quality assurance criteria is undocumented in the literature, although Williamson has used the process to identify quality assurance problems and set priorities for study.<sup>53</sup> Use of the technique involves the creation of a highly structured environment in which group participants perform many of their tasks silently and independently, free from the possible influence of other group members. The situation differs significantly from the unstructured group environment in which any group member, by virtue of his technical expertise, organizational position, or dominant personality, may stifle the initiative and creativity of others.

Williamson's application of the nominal group technique involved the formulation of a consensus of quality assurance problem areas prioritized according to perceived importance. It involved the listing of problem topics submitted one at a time, without criticism, from each panelist in round-robin fashion. After several rounds of topic submission, panelists individually weighted each topic on the consolidated listing. When weights for each topic had been summed, panelists were permitted to express opinions and criticisms concerning listed topics for the first time. Panelists were then given another chance to individually reweight topics. Topics with the highest summed scores were considered to be the most important for study prioritization.<sup>54</sup>

Use of the nominal group technique has several advantages over unstructured panel sessions. According to Jessee, creativity is fostered in the silent, independent generation of ideas. Conformity and status pressure are also reduced. Full participation by all members is assured by the round-robin submission of ideas. All opinions carry equal weight, and group members can

disagree (through the independent weighting process) without openly arguing. Throughout the process, the expression of true feeling is encouraged.<sup>55</sup>

#### Composition of panels

The formulation of explicit process criteria has traditionally been accomplished by panels of "experts," or subspecialists who practice in the academic environment. This procedure has been subjected to criticism in that medical practice in academia may, for any of several reasons, be different than practice in the "real world."<sup>56,57</sup> Donabedian speculates that it is perhaps because of this criticism that current panelists, in addition to their teaching affiliations, must often also be clinicians in active practice.<sup>58</sup>

The need for a balance in perspectives in the criteria formulation process, then, has not been overlooked. Indeed, the potential contributions of those in health professions other than medicine, and even consumers, has been recognized.<sup>59</sup> The need for incorporation of individuals with varying backgrounds is especially important to the development of criteria to assess the quality of delivery of programs of health care as opposed to the treatment of specific diagnoses. As an example, in the development of explicit criteria for evaluation of maternity care, family planning, and well-child care programs in Polk County, Florida, the process was conducted by a twelve-member multidisciplinary group consisting of staff nurses, nursing supervisors, administrators, a nutritionist, and a physician clinical health officer.<sup>60</sup>

#### Panel size

When the Delphi technique is used for explicit criteria development purposes, it can be assumed that the collective opinions of a large number of panelists are more reliable than the opinions of a small number (although there is probably some point at which the degree of reliability ceases to increase). Hence, the larger the number of panelists, the better. This is not the case,

however, with face-to-face panels where group size tends to become unmanageable after a certain point. A minimum panel size is, however, desirable to ensure adequacy of collective knowledge and experience among panelists and allow for sufficient variability in viewpoint.

A number of researchers have expressed opinions as to the desired size of panels. Donabedian cites Williamson as preferring panels of between five and thirteen members and Payne as favoring six-person panels. Donabedian himself recommends a panel size of six to nine when utilizing the nominal group technique.<sup>61</sup>

A retrospective review of actual criteria formulation panel membership reveals panel size to be rather small. Of a total of 41 panels which were formed, 12, or 29.3 percent, were comprised of 4 members, while 14, or 34.1 percent, contained 5 members. Only 8 panels, or 19.5 percent of the total, had a membership of greater than 5 persons. The range of panel membership varied from 3 to 7 persons.<sup>62</sup>

#### Objectives of this Study

1. To develop explicit criteria for assessing compliance with predetermined standards of performance pertaining to selected Army Occupational Health Program elements/sub-elements.
2. To determine whether developed criteria are realistic, objective, and measureable.
3. To determine whether a consensus exists between panels on the choice of developed criteria.
4. To determine the degree to which an installation occupational health program is in compliance with selected predetermined standards of performance.
5. To determine whether the selected method for evaluating compliance with

standards of performance is acceptable to an occupational health clinic staff.

#### Criteria for Feasible Solutions

Testing should:

1. Ascertain whether selected criteria are valid for evaluating occupational health program performance;
2. Determine whether the selected evaluation method is effective in identifying problems or weaknesses in an installation occupational health program;
3. Determine whether the selected evaluation method is feasible for an occupational health clinic staff to employ.

#### Definitions

1. The term "effective" refers to whether or not problems or weaknesses in an installation occupational health program can be identified as a result of implementation of a given program evaluation methodology.
2. The term "feasible" refers to acceptability of a proposed evaluation methodology by an occupational health service staff. Feasibility is based on subjective opinion as to overall value of the proposed methodology, time required on the part of the occupational health service staff to implement the methodology, and any other factors which an occupational health service staff might consider relevant.

#### Assumptions

1. Standards of performance pertaining to Army Occupational Health Program elements and sub-elements are available to installation occupational health service personnel for program evaluation.

2. Problems which exist with regard to occupational health program performance can be identified.

3. Structural factors and the process of occupational health service delivery are indicators of program performance and the quality of care provided to installation employees.

4. Concordance in the choice of criteria between similarly composed groups of knowledgeable individuals is an indicator of criteria validity.

5. Criteria established by group consensus is more valid in assessing performance than individually - developed criteria.

6. Professionals are more likely to accept criteria which they themselves have helped to formulate.

7. Group - developed criteria are more comprehensive in scope when individuals from more than one professional discipline participate in the criteria development process.

#### Limitations

1. Validity of criteria in terms of contribution to outcome is not addressed in this preventive health study other than in the assumption made above.

2. The research effort is limited by the cooperation which the researcher receives from group participants.

3. The research effort is limited to testing of the single methodology selected for evaluating occupational health program performance. No alternate evaluation methodologies will be developed or tested during the conduct of this study.

4. Researcher travel is limited to a maximum of three trips to each of the following locations where the research effort will be focused:

a. Seneca Army Depot, Romulus, NY.

b. U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD

5. This study constitutes an initial effort only and should not be regarded as the final definitive document on this subject. Critical review of final report content, as well as follow-up activities, will hopefully be conducted by others knowledgeable in the scope and content of the Army Occupational Health Program.

#### Research Methodology

This study was conducted in the following manner:

1. A sample of three Army Occupational Health Program elements which are required by Army regulations, Occupational Safety and Health Administration (OSHA) standards, and/or public law were selected for the study by the researcher (See Annex A).

2. For each program element, a standard of performance representative of those found in the literature was selected by the researcher. Performance standards were "givens" and were not open to disagreement.

3. Criteria with which to assess compliance with each given performance standard were developed by a panel of individuals assigned to the U.S. Army Health Clinic, Seneca Army Depot, Romulus, New York. The panel was composed of one physician and two occupational health nurses. Each of the three panelists was first asked to independently list as many criteria, in rank order of importance, as he/she felt to be necessary to assess compliance with each standard. Thereafter, a modified nominal group process (a structured technique used to bring about a group consensus) was employed in order to develop consolidated lists of prioritized criteria for assessing each standard.

4. Each panelist was also asked to list at least one measurement tool for each of his/her original criteria.

5. Upon finalization of the three criteria lists, the researcher assessed compliance with each standard, using the measurement tools specified for each criterion as verification instruments. In this manner, problems/weaknesses with respect to performance of each program element could be identified. Panelists were not made aware of this phase of the study until after completion of the nominal group process.

6. At the conclusion of the criteria development portion of the exercise, each panelist was given a questionnaire with which to record his/her views on this criteria development and occupational health program evaluation process. Subjective conclusions concerning group acceptability/process feasibility were drawn from the answers provided.

7. In order to obtain some indication of criteria validity, the modified nominal group criteria development process was repeated using a similarly composed (one physician and two nurses) panel of experts currently assigned to the Occupational and Environmental Medicine Division, U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD. Concordance between the two panels in the choice of assessment criteria was then determined by comparing the degree of criteria agreement against a standard established by the researcher after careful scrutiny of similar studies previously documented in the literature.

Footnotes

1 Edna May Klutas, Occupational Health Program Manual, Technical Guide No. 124 (Aberdeen Proving Ground, Maryland: United States Army Environmental Hygiene Agency, 1982), p. 1-4.

2 This statement is based on discussion with individuals assigned to the U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, Maryland.

3 United States Army Environmental Hygiene Agency, Occupational Health Survey No. 65-32-0092-83, Fort Devens, Massachusetts, 2-6 August 1982 (Aberdeen Proving Ground, Maryland: United States Army Environmental Hygiene Agency, 10 November 1982), p. 2.

4 Army Regulation 40-5, Health and Environment (25 September 1974), para 4-5 c (2).

5 United States Army Health Services Command Regulation 11-4, HSC Operating Program - Preventive Medicine Guidelines for Implementation of a Preventive Program for MEDDAC/MEDCEN (22 June 1982), para. 3b (6).

6 Klutas, p. 3-39.

7 Ibid.

8 Ibid., pp. 2-25 and 3-39 thru 40.

9 United States Army Environmental Hygiene Agency, Occupational Health Nursing Responsibilities, Technical Guide No. 005 (Aberdeen Proving Ground, Maryland: United States Army Environmental Hygiene Agency, undated), p.3.

10 Joint Commission of Accreditation of Hospitals, Accreditation Manual for Hospitals 83, (Chicago, Illinois: Joint Commission on Accreditation of Hospitals, 1982), pp. 151-3.

11 Department of Health, Education and Welfare, Office of Professional Standards Review, PSRO Program Manual (Washington, DC.: U.S. Government Printing Office, 1974), Chap. 7, p. 16.

12 Avedis Donabedian, M.D., The Definition of Quality and Approaches to its Assessment (Ann Arbor, Michigan: Health Administration Press, 1980), p. 20.

13 Ibid., pp. 21-2.

14 John H. Mitchell, M.D., "Peer Review and Occupational Medicine," Journal of Occupational Medicine, 20, No. 4 (April 1978), 280.

15 Richard L. Davis, "The Occupational Health Audit," Occupational Health Nursing, 24, No. 2 (February, 1976), 10.

16 Gary Krieger, M.D., "Auditing Occupational Medicine Programs: A Structural Approach," (unpublished manuscript, 1982), p. 1.

17 Sidney Lerner, M.D., "Accreditation of Occupational Health Programs:

Development and Validation of Criteria," American Industrial Hygiene Association Journal, 37, No.11 (November, 1976), 636-7.

18 Department of Environmental Health, Kettering Laboratory, University of Cincinnati, Standards, Interpretations, and Audit Criteria for Performance of Occupational Health Programs (Washington, D.C.: U.S. Department of Health, Education and Welfare, 1979), p. i.

19 Donabedian, Definition of Quality, p. 81

20 Tom Crestoffel and Martha Lowenthal, "Evaluating the Quality of Ambulatory Health Care: A Review of Emerging Methods," Medical Care, 15, No. 11 (November, 1977), 887.

21 Ibid, p. 892.

22 Donabedian, Definition of Quality, p. 83.

23 John J. Griffith, "Quality Measures," in Measuring Hospital Performancy (Blue Cross Association, 1978), p. 48.

24 Donabedian, Definition of Quality, p. 82.

25 Griffith, p. 47.

26 Donabedian, Definition of Quality, p. 143-5.

27 Joan Knight, "Community Health Care: Assuring the Quality of Preventive Care," Quality Review Bulletin, 6, No. 3 (March 1980), 6.

28 Hugh C. Thompson, M.D. and Charles E. Osborne, "Development of Criteria for Quality Assurance of Ambulatory Child Health Care," Medical Care, 12, No. 10 (October, 1974), 809.

29 Ibid., p. 814.

30 Richard K. Hill, M.D., "Quality Assurance in Ambulatory Care," Primary Care, 7, No. 4 (December, 1980), 715.

31 Barbara S. Hulka, M.D., "How to Evaluate Ambulatory Medical Care," American Journal of Public Health, 70, No. 3 (March, 1980), 217.

32 Avedis Donabedian, M.D., "Advantages and Limitations of Explicit Criteria for Assessing the Quality of Health Care," Milbank Memorial Fund Quarterly, 59, No. 1 (1981), 99-105.

33 Barbara S. Hulka, M.D., "Peer Review in Ambulatory Care: Use of Explicit Criteria and Implicit Judgements," Medical Care, 17, No. 3 Supplement (March, 1979), 2-3.

34 Army Regulation 40-66, Medical Record and Quality Assurance Administration (1 November 1982), para 9-6.

35 John W. Williamson, M.D., "Evaluating Quality of Patient Care: A

Strategy Relating Outcome and Process Assessment," Journal of the American Medical Association, 218, No. 4 (October 25, 1971), 569.

36 Glen E. Hastings, M.D., et al. "Peer Review Checklist: Reproducibility and Validity of a Method for Evaluating the Quality of Ambulatory Care" American Journal of Public Health, 70, No. 3 (March, 1980), 224-5.

37 Robert A. Dershewitz, M.D., Richard A. Gross, M.D., and John W. Williamson, M.D., "Validating Audit Criteria: An Analytic Approach Illustrated by Peptic Ulcer Disease," Quality Review Bulletin, 5, No.10 (October, 1979), 19.

38 Ibid., p. 20.

39 Hastings, pp. 224-5.

40 William E. McAuliffe, Ph.D., "Studies of Process-Outcome Correlations in Medical Care Evaluations: A Critique," Medical Care, 16, No. 11 (November, 1978), 908.

41 Ibid., p. 907.

42 Ibid., p. 929.

43 Avedis Donabedian, M.D., The Criteria and Standards of Quality (Ann Arbor, Michigan: Health Administration Press, 1982), p. 302.

44 Ibid., p. 308.

45 Charles E. Osborne, Ed.D., and Hugh C. Thompson, M.D., "Criteria for Evaluation of Ambulatory Child Health Care by Chart Audit: Development and Testing of a Methodology," Pediatrics, 56, No. 4 (October, 1975), 636-7.

46 Donabedian, Criteria and Standards, p. 29.

47 Martin D. Merry, M.D., "A Physicians' Perspective on Proper Design of Quality Assessment Criteria," Quality Review Bulletin, 8, No. 10, (October, 1982), 3.

48 Hulka, "Peer Review in Ambulatory Care," p.8, 70.

49 Charles E. Osborne, Ed.D., and Hugh C. Thompson, M.D., "Criteria for Evaluation of Ambulatory Child Health Care by Chart Audit: Development and Testing of a Methodology," Pediatrics, 56, No. 4 (October, 1975), 632, 6.

50 Avedis Donabedian, M.D., "Methods of Deriving Criteria for Assessing the Quality of Medical Care," Medical Care Review, 37, No. 7 (Fall, 1980), 662.

51 Frederick J. Romm and Barbara S. Hulka, M.D., "Developing Criteria for Quality of Care Assessment: Effect of the Delphi Technique," Health Services Research, 14, No. 4 (Winter, 1979), 310.

52 Andrew H. Van de Venn and Andre L. Delbecq, "Nominal Versus Interacting

Group Processes for Committee Decision-Making Effectiveness," Academy of Management Journal, 14 (June, 1971), 210.

53 John W. Williamson, M.D., "Formulating Priorities for Quality Assurance Activity - Description of a Method and its Application," Journal of the American Medical Association, 239, No. 7 (February 13, 1978), 632-5.

54 Ibid., p. 633.

55 William F. Jessee, M.D., "Techniques for Establishing Quality Assurance Priorities," Hospital Peer Review, 6, No. 6 (June, 1981), 72.

56 Donabedian, "Methods for Deriving Criteria," p. 674.

57 Edward H. Wagner, M.D., et al. "Influence of Training and Experience on Selecting Criteria to Evaluate Medical Care," American Journal of Public Health, 68, No. 16 (May, 1978), 871.

58 Donabedian, "Methods for Deriving Criteria," p. 674.

59 Ibid., p. 675.

60 Knight, p. 6.

61 Donabedian, "Methods for Deriving Criteria," p. 678.

62 Ibid., p. 679.

## II. DISCUSSION

### Rationale for the Evaluation Methodology Selected

The approach used during the conduct of this research represents an attempt to apply quality assessment principles and techniques to overall occupational health program evaluation. The method selected for testing was chosen by the researcher because it appears to meet the needs for program evaluation which are discussed in the USAEHA Occupational Health Program Manual and related literature.

Quality assurance, which is generally construed to be strictly related to patient care activities, is only one component of overall program evaluation. Given this relationship, it was hypothesized that the same kinds of quality assessment activities which are documented in the literature could be expanded in scope for program evaluation purposes.

Professionally developed quality assessment criteria are necessary because there is no one best or required way of providing medical care for any given diagnosis or patient category. This situation is unlike that of the Army Occupational Health Program, the elements of which are specified to a great extent by laws and regulations. The unique aspects of each Army installation, however, mandate flexibility in the implementation of program provisions. Therefore, it was hypothesized that personnel involved in occupational health program implementation at the local level are in the best position to evaluate performance with regard to their own programs, just as it is generally assumed that health professionals in any given locale are most qualified to define and judge acceptable quality of care in their own geographical and specialty areas.

### Selection of Performance Standards

As is evident from a review of Table 1, a total of sixteen program elements (several of which are divided into sub-elements) are included as components of

the Army Occupational Health Program. In order to determine the degree to which program elements/sub-elements are being carried out, it was first necessary to establish performance standards for each. These standards were based on the content of applicable laws or regulations. Performance standards, then, must be externally imposed upon the installation rather than being internally determined. The imposition of broadly-worded standards, however, permits considerable latitude on the part of installation personnel in their approaches to compliance.

In order to test the selected evaluation methodology, performance standards pertaining to two Army Occupational Health Program elements and one sub-element were selected by the researcher. These are listed with their sources in Table 1.

=====

TABLE I

Selected Occupational Health Program Performance Standards

<u>Program Element/ Sub-Element</u>	<u>Performance Standard</u>	<u>Source</u>
Preplacement examinations	Preplacement examinations which are sufficiently inclusive to aid in suitable job placement will be provided whenever medical evaluation is necessary for work assignment.	<u>HSC Pamphlet 40-2; Standards, Interpretations and Audit Criteria for Performance of Occupational Health Programs.</u>
Health Education and Counseling	There shall be a health education and counseling program to promote both general health maintenance and safe, healthful work practices.	<u>Standards, Interpretations, and Audit Criteria for Performance of Occupational Health Programs.</u>
Pregnancy Surveillance Program	Essential health supervision shall be provided to ensure that women workers or their pregnancies are not adversely affected by their work assignments.	<u>AR 40-5.</u>

=====

It should be noted that only one of the above standards (pertaining to health education and counseling) was taken verbatim from its source. The standard for preplacement examinations represents a combination of two statements taken from the sources shown. The pregnancy surveillance standard is a rewording of a similar statement contained in AR 40-5. The precise wording of the selected standards could, in reality, be subject to some debate. For this reason, and because this research was not intended to assess the appropriateness of program elements or performance standards, acceptance of the selected standards as written was made a condition of the study.

#### Rationale for Selection of Seneca Army Depot as a Site for this Study

Seneca Army Depot (SEAD), Romulus, New York, was selected as the study site for this project for several reasons. First, a major portion of the health clinic's workload is occupational health oriented. Approximately 900 civilians and 500 military personnel are assigned at the installation in various jobs related to weapons maintenance, ammunition storage and demilitarization, strategic materials stockpiling, and industrial plant equipment refabrication.

Second, the health clinic staff consists of two physicians and two nurses who were available for study participation as panelists. The researcher was desirous of having at least four individuals on the criteria development panel in order to conform with recommendations previously cited from the literature. In addition, this group was previously observed to work well together. The importance of this factor in the face-to-face criteria development process was noted by Williamson.<sup>1</sup>

The final reason for the selection of SEAD as a study site was the interest in the study shown by the health clinic officer-in-charge and his familiarity with the intent of the quality assurance process as espoused by the JCAH. The

researcher was aware of the difficulties involved in obtaining cooperation for a study of this nature. Therefore, the interest expressed by study participants was an important criterion for site selection.

### Conduct of the Research at Seneca Army Depot

#### Preliminaries

Williamson, in his research effort to formulate priorities for quality assurance activities using a modified nominal group technique, held a training session approximately one month prior to the formal priority development meeting. This session served to familiarize participants with the panel technique to be used and stimulate ideas for subsequent presentation.<sup>2</sup>

A similar methodology was used in this study. Approximately two months prior to the criteria development session, the researcher visited the SEAD health clinic for the purpose of explaining the intent and proposed conduct of the study and soliciting support for his effort. Specific standards for assessment were not presented to the panelists at this time, nor was the criteria development technique to be used demonstrated. The process to be followed was, however, explained and questions answered. Despite initial opposition from one of the prospective panelists who was concerned about potential criticism of his medical practice, group cooperation was secured.

The next preliminary phase involved the preparation and mailing of a letter of instruction to each SEAD panel participant. A copy of this letter and its inclosures are attached as Appendix B. The criteria development process which was described in the letter was similar to the one used by Williamson, with several exceptions. First, as a time-saving measure, panelists were asked to have their initial criteria lists prepared in advance of the researcher's arrival for the panel session. This procedure would permit the advance preparation and immediate availability of first-round consolidated criteria lists at the

outset of the panel discussion. Second, panelists were asked to initially list criteria for assessing compliance with each standard in order of perceived importance, with the most important criterion being listed first. The definition of "important" was left up to each panelist.

The letter of instruction also emphasized the need for criteria realism, objectivity, and measureability, and defined each. The requirement for the selection of at least one measurement tool for assessing compliance with each listed criterion was intended to serve a dual purpose; first, to ensure criterion measurability, and second, to provide the researcher with a means of assessing the extent of compliance with a given criterion in order to determine shortcomings in overall program performance. Panelists were not informed in advance that the measurement tools which they provided would be used to assess compliance with their own selected criteria. To do so would have undoubtedly biased the criteria selection process.

#### Development of final consolidated criteria lists

Each of the three face-to-face panel sessions began with the distribution of an initial consolidated criteria list for assessing compliance with one of the selected standards. Panelists were permitted time to review the list and ask clarification-type questions about the criteria. Criticism of criteria was not permitted at this point. Panelists were also given the opportunity to add overlooked criteria to the consolidated list.

Upon conclusion of the initial review, panelists were asked to rank each criterion on the consolidated list, again in order of perceived importance. The most important criterion was to be ranked "1," and so on. When this process was completed, the researcher collected the ranked lists, summed the scores given to each criterion, and prepared a new consolidated criteria listing with

criteria ranked according to summed scores.

The second-round criteria list was distributed to panelists for review and discussion. At this point, opinions and criticisms pertaining to criteria were allowed.

After discussion had been completed, criteria were once more re-ranked by panelists. The scores awarded to each criterion were again summed and a final consensus criteria list was prepared. For research purposes, content of each final consolidated criteria list was limited to the ten criteria most highly ranked by panelists.

#### Review of measurement tools

Measurement tools previously selected for verifying compliance with each of the criteria on the final consolidated criteria lists were reviewed and clarified for the researcher. In some cases, additional measurement tools were added to the list. Upon completion of this procedure, panelists were informed of the researcher's intention to use listed measurement tools as a basis for assessing compliance with listed criteria, a task which was subsequently accomplished.

#### Completion of questionnaires

Each panelist was given a questionnaire with which to record his views concerning the criteria development process in which he had participated (See Appendix C). Questionnaire results were used to evaluate acceptability/feasibility of the evaluation methodology which was tested.

#### Additional comments

The panel which met to develop criteria lists and measurement tools was composed of one physician and two nurses. The second physician, who had

originally agreed to assist in the study, was hospitalized and underwent bypass surgery several weeks prior to the panel phase. Therefore, this individual was unavailable for participation.

Development and ranking of criteria lists and measurement tools by panelists was conducted as described in the study protocol. An unanticipated question was raised, however, as to the procedure for ranking essentially identical criteria submitted by different panelists. Not wanting to bias results by arbitrarily eliminating duplicate criteria, the researcher instructed panelists to rank one criterion according to their perceptions of its true relative importance while assigning a lower score to each similar item. This procedure worked well because panelists were able to agree upon which duplicate criteria to rank high and low during the discussion phase preceding the final independent ranking process.

The measurement tools selected to verify compliance with self-developed criteria were utilized by the researcher to assess overall compliance with each standard. Verification was conducted largely through personal observation, interviews with the health clinic staff, and reviews of medical records. Panelists were surprised and expressed some opposition to the conduct of this portion of the study. Initial disagreement was somewhat lessened, however, when the reason for not originally disclosing the researcher's intentions was explained to the panel.

#### Results of the Research Conducted at Seneca Army Depot

Tables 2, 3 and 4 summarize the results obtained during the SEAD portion of this study. Included are consolidated criteria lists and measurement tools selected to assess compliance with each standard and a listing of problems/weaknesses identified during the compliance verification process.

TABLE 2

CONSOLIDATED CRITERIA LIST AND MEASUREMENT TOOLS SELECTED TO ASSESS COMPLIANCE WITH THE STANDARD APPLICABLE TO PROGRAM SUB-ELEMENT "PREEMPLOYMENT PHYSICAL EXAMINATIONS," AND PROBLEMS/SHORTCOMINGS IDENTIFIED DURING THE COMPLIANCE VERIFICATION PROCESS AT SENECA ARMY DEPOT, NEW YORK

CRITERIA	MEASUREMENT TOOLS	PROBLEMS/WEAKNESSES IDENTIFIED
<p>1. The installation Civilian Personnel Office contacts the health clinic to make preplacement examination appointments for all prospective employees.</p>	<p>a. Entries in health clinic appointment book;            b. Review of C.P.O. printout of all installation civilian employees against medical records in health clinic. A medical record is started for all new employees presenting for preemployment physical exam/screening tests. No record indicates employee listed on the printout did not present at health clinic.</p>	<p>Health clinic personnel do not periodically match up the C.P.O. employee listing with medical records on hand to verify that new employees have presented at the health clinic.</p>
<p>2. Part A of the physical examination form (SF 78) is completed at the Civilian Personnel Office.</p>	<p>SF 78.</p>	<p>None</p>
<p>3. Part B of the physical examination form (SF 78) is completed by the appointing officer (person authorized to select the candidate).</p>	<p>SF 78</p>	<p>None</p>
<p>4. Part C of the physical examination form (SF 78) is completed by the examining physician.</p>	<p>SF 78</p>	<p>None</p>
<p>5. Conditions or physical defects that exist prior to employment which may limit performance or mobility have</p>	<p>Physical examination forms (SF 78 for civilians, SF 600 for military).</p>	<p>None</p>

TABLE 2 (Continued)

CRITERIA	MEASUREMENT TOOLS	PROBLEMS/WEAKNESSES IDENTIFIED
6. Appropriate job-specific medical tests are ordered by the examining physician.	<p>a. Examination requirements/job standards contained in the following publications:</p> <p>(1) <u>TM MED 501, Hearing Conservation, March, 1980.</u></p> <p>(2) <u>TB MED 506, Occupational Vision, December, 1981.</u></p> <p>(3) <u>U.S. Army Environmental Hygiene Agency publication, Recommendations for Periodic Job-Related Examinations for Selected Occupations, Appendices G and H;</u></p>	None.
7. Ancillary health clinic personnel are properly qualified to perform their duties.	<p>b. Card files maintained on all employees which list required tests specific to each employee's job. Required tests are based on recommendations contained in the publications listed above;</p> <p>c. Medical record entries/test results.</p> <p>a. Certificates of course completion;</p> <p>b. Scope of Practice Proficiency verification forms signed by observing physician upon completion of annual nurse and 91B recertification;</p> <p>c. Verification forms signed by Chief, Physical Therapy Service, Fort Devens MEDDAC, upon completion of staff credentialing for specific PT procedures;</p> <p>d. X-ray technician registration.</p>	None
8. Proper equipment is on hand at the health clinic for the conduct of required	<p>a. Examination requirements for specific occupations as contained in the publications listed in 6 a. above;</p>	<p>a. Workers exposed to radiation require slit lamp testing. Equipment</p>

TABLE 2 (Continued)

CRITERIA	MEASUREMENT TOOLS	PROBLEMS/WEAKNESSES IDENTIFIED
preplacement testing.	b. Equipment calibration stickers and related documentation.	<p>is on hand but health clinic personnel are not trained to use equipment.</p> <p>b. Munitions handlers require stress testing. Required equipment is not on hand at the health clinic.</p>
9. A physician performs each physical examination, evaluates test results, and makes appropriate recommendations (such as qualified or nonqualified).	Physical examination form (SF 78).	None.
10. Patients are referred to their personal physicians when indicated.	SF 78 entry "conclusions" block for comment that prospective employee was given a consultation form for delivery to his personal physician.	<p>None. However measurement tool is inadequate for compliance assessment. Peer review process is necessary to document whether referral is appropriate/inappropriate. Administrative review is insufficient measurement tool.</p>

TABLE 3

CONSOLIDATED CRITERIA LIST AND MEASUREMENT TOOLS SELECTED TO ASSESS COMPLIANCE WITH THE STANDARD APPLICABLE TO PROGRAM ELEMENT "HEALTH EDUCATION AND COUNSELING," AND PROBLEMS/SHORTCOMINGS IDENTIFIED DURING THE COMPLIANCE VERIFICATION PROCESS AT SENECA ARMY DEPOT, NEW YORK

CRITERIA	MEASUREMENT TOOLS	PROBLEMS/WEAKNESSES IDENTIFIED
1. A needs assessment has been made.	a. Medical records review for history and physician findings; b. Accident reports review for recurrent injuries; c. Audiogram review for evidence of problems in specific occupational groups or work areas; d. Results of the comprehensive industrial hygiene survey performed in May 82 by Bolt Beranek and Newman Inc.	The information necessary to perform a needs assessment is available to the health clinic staff, but a formal assessment has not been made.
2. Target groups have been identified.	a. May 82 industrial hygiene survey findings; b. Results of study conducted to check hearing of personnel working in the following areas: boiler room, fire fighting, electrical shop, roads and grounds, plumbing shop, carpenter shop.	None.
3. Appropriate health education methods have been identified.	a. Review of availability of educational materials, target personnel, personnel to provide education, nursing staff; b. SEAD Health Clinic Semi-Annual Status Report for documentation stating that classes were given.	None.
4. Work site topics have been identified.	Entries in clinic physician's notebook containing observations made during worksite visits.	Observations in physician's notebook include a listing of job functions, hazards, and exposures,

TABLE 3 (Continued)

CRITERIA	MEASUREMENT TOOLS	PROBLEMS/WEAKNESSES IDENTIFIED
5. Key health topics have been identified.	a. Entries in physician's worksite observation notebook; b. Articles from the professional literature;	but no mention of worksite educational topics.
6. Workshops and seminars have been established for the workers.	a. SEAD health clinic Semi-Annual Status Report for documentation stating that workshops and seminars were presented; b. Written request to Civilian Personnel Office to arrange time for presentation of hearing conservation workshop to be presented at the worksite by health clinic staff.	No documentation exists to verify that key health topics have been identified.
7. Health education articles are being published.	a. Articles published in the Depot Bulletin and as separate flyers; b. SEAD health clinic Semi-Annual Status Report for documentation stating that health education articles were published.	None.
8. Individual counseling to those in the occupational health surveillance program is being conducted.	a. Documentation in medical records that counseling was provided.	Medical records of seven employees in the occupational health surveillance program were checked for documentation that individual counseling concerning job hazards was conducted. Two records contained no

TABLE 3 (Continued)

CRITERIA	MEASUREMENT TOOLS	PROBLEMS/WEAKNESSES IDENTIFIED
9. Learner's knowledge is being evaluated following health education and counseling.	<p>a. Observation of work practices of employees;</p> <p>b. Documentation of occupational injuries in medical records;</p> <p>c. Results of questionnaire completed before and after presentation of an educational program on hypertension presented at SEAD by the Red Cross;</p> <p>d. Answers to smoking habits questions listed on questionnaire given to employees who undergo spirometry testing and smoking counseling. Compare with answers to same questions provided at time of spirometry retest three months later.</p>	<p>documentation that such counseling was provided. 71 per cent compliance with criteria was noted.</p>
10. The need for repeating the educational process is being determined.	See 9 a-d above.	<p>Spot-check of employee work practices are planned by health clinic staff personnel. No observation of work practices is presently being conducted.</p>
		See above comment.

TABLE 4

CONSOLIDATED CRITERIA LIST AND MEASUREMENT TOOLS SELECTED TO ASSESS COMPLIANCE WITH THE STANDARD APPLICABLE TO PROGRAM ELEMENT "PREGNANCY SURVEILLANCE PROGRAM" AND PROBLEMS/SHORTCOMINGS IDENTIFIED DURING THE COMPLIANCE VERIFICATION PROCESS AT SENECA ARMY DEPOT, NEW YORK

CRITERIA	MEASUREMENT TOOLS	PROBLEMS/WEAKNESSES IDENTIFIED
1. Work areas which are potentially hazardous for pregnant females have been identified.	AR 40-501	AR 40-501 lists duty limitations for pregnant active duty females, but does not identify potentially hazardous occupations. Measurement tool is inappropriate for compliance assessment. No list of work areas which are potentially hazardous has been compiled by the health clinic staff.
2. Female workers who may become pregnant have been identified.	None	No practical way to identify workers who may become pregnant. Criterion not realistic or measurable.
3. A risk assessment has been conducted for all participating pregnant employees.	Medical records documentation of job, risks, and recommended action.	None.
4. Pregnant females who work in areas or perform functions which are potentially hazardous to their pregnancies will be reassigned to non-hazardous areas/duties.	<p>a. Medical record review for copy of DD Form 689, Individual Sick Slip, which is sent to supervisor as documentation of pregnancy and work limitations for civilian employees;</p> <p>b. Medical record review for copy of DA Form 3349, Physical Profile Board</p>	Medical records pertaining to two pregnant civilian employees assigned to potentially hazardous duties contained no copy of DD Form 689 as evidence that supervisors were notified

TABLE 4 (Continued)

CRITERIA	MEASUREMENT TOOLS	PROBLEMS/WEAKNESSES IDENTIFIED
<p>Proceedings, which is sent to Commander as documentation of pregnancy for military personnel;</p> <p>c. Feedback from pregnant employees.</p>		<p>of work limitations.</p> <p>Note: The health clinic staff does not follow pregnant females after documenting the fact of pregnancy. Pregnant females are, however, encouraged to contact the health clinic if any problems occur.</p>
<p>5. The health clinic staff provides occupational health counseling to pregnant workers.</p>	<p>Medical record review for documentation of counseling.</p>	<p>None.</p>
<p>6. Female employees are being encouraged to notify the health clinic when they become pregnant.</p>	<p>a. Articles published in SEAD Weekly bulletin;</p> <p>b. Content of pamphlet entitled, "Civilian Employee Occupational Health Services," currently undergoing staffing.</p>	<p>No articles on this subject were found upon a review of material submitted by the health clinic for publication in the Weekly Bulletin. Pamphlet to be published, however, does encourage employees to make their pregnancies known to the health clinic.</p>

TABLE 4 (Continued)

CRITERIA	MEASUREMENT TOOLS	PROBLEMS/WEAKNESSES IDENTIFIED
7. Pregnant employees who are not already receiving care from a private physician are being referred by the health clinic to a physician of their own choice.	Interview with CHAMPUS advisor.	None.
8. The work areas, duties, and obstetricians of pregnant females are known to the health clinic.	Entries in book listing pregnant females maintained by the Occupational Health Nurse.	In several cases, the name of the pregnant female's obstetrician was not included with other logged information concerning the pregnant employee.

The content of Tables 2, 3 and 4 clearly shows that the criteria development methodology employed in this study was effective in producing explicit structure and process criteria for assessing compliance with preselected performance standards. The ranking process was highly effective in eliminating those criteria which were redundant or of little perceived importance. Although some disagreement was expressed by panelists concerning the final rankings for each list, only the relative importance of criteria were of concern as opposed to final criteria list content. It was obvious, then, that this modified nominal group procedure, when utilized as described herein, is effective as a process to "weed out" criteria which are perceived to be less essential while retaining those with the greatest value for compliance assessment purposes.

The requirements for criteria realism, objectivity, and measureability, as expressed to panelists in the letter of instruction, were largely satisfied with one exception. A pregnancy surveillance program criterion, which required identification of females who may become pregnant (number two) was determined to be unrealistic and not measureable. In addition, the measurement tool for assessing compliance with criterion number one on the same list was deemed to be inappropriate. One other inadequate measurement tool was also noted. Assessment of the final "preemployment physical examination" criterion could not be accomplished using the measurement tool provided. Indication for referral to a personal physician is a matter of professional judgement; therefore, only through the peer review process can compliance with this criterion be appropriately assessed.

The existence of problems or weaknesses in meeting criteria indicates the extent of compliance with predetermined performance standards. Table 5 summarizes the results of the compliance verification process:

Table 5

## Summary of Results from Compliance Verification Process

<u>Program Element/ Sub-Elements</u>	<u>Total Number of Measureable Criteria</u>	<u>Number of Criteria in which Problems/ Weaknesses were Noted</u>	<u>Per Cent of Criteria in which Problems/ Weaknesses were Noted</u>
Preemployment Physical Examinations	10	3*	30
Health Education and Counseling	10	6	60
Pregnancy Surveillance Program	7	4**	57

\*Includes criterion for which selected measurement tool is inadequate for compliance assessment.

\*\*Includes criterion for which selected measurement tool is inappropriate for compliance assessment.

It is apparent from the above results and more detailed observations contained in Tables 2, 3 and 4 that a variance exists between what panelists say should be done and what actually is done. This finding is comparable to results obtained in a similar study conducted by Wagner, et al. which measured concordance between physician opinion and recorded clinical practice.<sup>3</sup>

An examination of questionnaire comments submitted by the three SEAD panelists revealed both a great reliance on personal knowledge of occupational health programs during the initial development of criteria lists and a general dissatisfaction with the study methodology employed. Responses provided to the first question indicated only minimal consultation with available Army Occupational Health Program references, even though several were available to health clinic employees. The failure to utilize available references may indicate an initial lack of motivation to assist in the study or may be reflective of

the lack of preparation time available to panel participants due to the absence of one physician and the heavy clinic workload. The researcher tends toward the latter explanation in light of additional comments that the criteria development process was too time consuming, laborious, tedious, and caused panelists to get behind in their work.

In retrospect, question three, which concerned the value of the study, may have been inappropriate since the panelists, although appraised of the overall research objective of identifying program problems/weaknesses, were asked this question prior to the conduct of the compliance verification process by the researcher. If they had been aware of the results obtained during this study phase, their comments, which were largely negative, might have been more favorable. It was interesting to note that one panelist, after providing a negative comment to this question, went on to state that "no quality controls" existed for the SEAD Occupational Health Program.

Answers provided to the fourth question revealed a diversity of opinion on how best to evaluate an installation occupational health program. One panelist suggested a review of occupational illnesses, injuries, and employee sick leave records. This approach focuses on acute episodes and completely ignores evaluation of program effectiveness in terms of chronic, insidious disease and injury (such as hearing loss) prevention. Another panelist stated that specific evaluation requirements should be passed down from higher levels rather than being formulated at SEAD. In researcher's opinion, this comment again reflects the lack of time available to the health clinic staff to "sit down" and objectively attempt to evaluate their program. It may also indicate a lack of desire to do so in the absence of any formally stated requirement from higher headquarters.

Conduct of the Research at the U.S. Army Environmental Hygiene Agency

Because of local differences in the implementation of the Army Occupational Health Program and the composition of occupational health service staffs, it would be expected that criteria developed to assess compliance with performance standards would vary somewhat between installations. Because of these and perhaps other variables, it would be difficult to assess criteria validity through a comparison of criteria lists developed at different installations, unless the installations were carefully matched. Even then, reproducibility of structural and process criteria would only provide an indication of true validity, as previously discussed.

In an attempt to gain a basic indication of SEAD criteria validity, the same criteria development process that was conducted at SEAD was carried out using a panel of occupational health experts assigned to the Occupational and Environmental Medicine Division, U.S. Army Environmental Hygiene Agency (AEHA), Aberdeen Proving Ground, Maryland. Personnel assigned to this division are routinely tasked with monitoring installation compliance with applicable occupational health laws and regulations. They are therefore able to provide highly educated opinions as to the selection of criteria for compliance assessment purposes.

The objective of this exercise was to determine the extent of agreement, or concordance, of criteria selection between the two panels. As was the case at SEAD, the methodology employed involved a preliminary visit to AEHA to explain study intent and conduct and to secure support. This visit was followed by a letter of instruction similar to that sent to SEAD panel members (Appendix D). The original AEHA panel was to consist of two physicians and two nurses; one of the physicians, however, was unable to participate due to a last-minute temporary duty assignment. Final panel membership, then, consisted of one physician

and two nurses, a composition which matched that of the SEAD panel.

Development of criteria lists by panelists was carried out according to the protocol contained in the letter of instruction. The provision of measurement tools was again requested solely to ensure the measureability of each criterion.

At the conclusion of the criteria development process, panelists were asked to complete the same questionnaire which was provided to SEAD participants.

Results of the Research Conducted at the U.S. Army Environmental Hygiene Agency

Tables 6, 7 and 8 contain criteria lists and corresponding measurement tools developed by the AEHA panelists. All criteria were determined to be measureable. Once again, panelists were satisfied with the content of each final criteria list.

Table 9 compares the criteria lists developed by the SEAD and AEHA panels. The comparison which was made was based on the researcher's opinion of criteria intent rather than wording and is intended to illustrate the degree of overlap in thinking among the two panels.

=====  
Table 9

Comparison of Criteria Lists - SEAD Versus AEHA

<u>Program Element/ Sub-Elements</u>	<u>Total Number of Criteria</u>	<u>Number of Criteria Covered on Both Lists</u>	<u>Per Cent of Common Criteria</u>
Preemployment Physical Examinations	19	12	63
Health Counseling and Education	19	5	26
Pregnancy Surveillance Program	17*	13	76

\*Not including one criterion which was found to be non-measureable.  
=====

TABLE 6

CONSOLIDATED CRITERIA LIST AND MEASUREMENT TOOLS SELECTED TO ASSESS COMPLIANCE WITH THE STANDARD APPLICABLE TO PROGRAM SUB-ELEMENT "PREEMPLOYMENT PHYSICAL EXAMINATIONS" BY PANEL OF EXPERTS, U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

CRITERIA

MEASUREMENT TOOLS

1. The inventory of health hazards is used appropriately in determining suitable job placement.

- a. Local Occupational Health Hazard Inventory (LOHHI) to ensure that it exists, it is updated annually, and that the occupational health physician has access;
- b. Spot check new employee health records;
- c. Spot check Military Personnel Office (MILPO) roster;
- d. Spot check military medical records.

2. The content of each required examination is sufficient to determine ability to perform assigned work functions.

- a. Employee job description;
- b. Federal Personnel Manual (FPM), Chapter 339 (Qualification Requirements (Medical));
- c. Physical examination form (SF 78) in medical records;
- d. Exam/test results in medical record;
- e. Examination requirements contained in USAEHA publication, Recommendations for Periodic Job-Related Examinations for Selected Occupations, Appendices G and H.

3. Content of all examinations includes tests/examinations specific to potential health hazards present in the work environment.

- a. LOHHI;
- b. Appendices G and H, USAEHA Job-Related Exam Recommendations;
- c. DOD Manual 6055.5 M, Occupational Health Surveillance Manual;
- d. National Institute for Occupational Safety and Health (NIOSH) Publication No. 81-125, Occupational Health Guidelines for Chemical Hazards;
- e. Medical record-test/exam results.

TABLE 6 (Continued)

CRITERIA	MEASUREMENT TOOLS
4. Appropriate evaluation is performed for positions requiring specific levels of physical fitness.	<ul style="list-style-type: none"> <li>a. Availability of inventory of such positions at the occupational health clinic;</li> <li>b. Availability of fitness criteria (FPM 339) for such positions at the occupational health clinic;</li> <li>c. Spot check of medical records to determine whether such criteria are used in the preplacement evaluation of employees.</li> </ul>
5. For each employee who has been identified as working in a potentially hazardous area, a past work history has been obtained.	Medical record.
6. Exams will include a baseline audiogram if assignment is to a noise hazardous area.	Medical record.
7. Vision standards and eye protection requirements will be considered in the conduct of all vision exams.	<ul style="list-style-type: none"> <li>a. Vision standards for specific jobs contained in TB MED 506, Occupational Vision;</li> <li>b. Physical examination form (SF 78) - position title block.</li> </ul>
8. Chronic medical conditions will be considered and evaluated for all employees undergoing preplacement examinations.	Medical record.
9. Physican standards are adhered to in those jobs that have established standards.	<ul style="list-style-type: none"> <li>a. FPM 339 (job standards);</li> <li>b. Medical record.</li> </ul>

TABLE 7

CONSOLIDATED CRITERIA LIST AND MEASUREMENT TOOLS SELECTED TO ASSESS COMPLIANCE WITH THE STANDARD APPLICABLE TO PROGRAM ELEMENT "HEALTH EDUCATION AND COUNSELING" BY PANEL OF EXPERTS, U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

CRITERIA

1. Behavior change is effected by health education efforts.
2. All new employees have been provided an occupational health service orientation.
3. Job-related health information is available to the employee.
4. Worksite visits are conducted for the purpose of health education and on-site counseling.
5. Individuals enrolled in the hearing conservation program receive at least one class of related education annually.
6. Supervisors have been provided training classes reference health hazards in the work environment.
7. Individuals required to wear respirators received training on use and cleansing of same.

MEASUREMENT TOOLS

- Spot checks at worksite to evaluate use of protective equipment and knowledge of hazards associated with job.
- Documentation in medical record that orientation was given or pamphlet was handed out.
- Documentation which shows that:
- a. The occupational health clinic staff makes worksite visits;
  - b. Relevant work site classes are offered;
  - c. Written handouts on job exposures are provided to employees.
- Summary report of visit.
- Records of class content and lists of attendees.
- Records of class content and lists of attendees.
- Records of class content and lists of attendees.

TABLE 7 (Continued)

CRITERIA	MEASUREMENT TOOLS
8. Job-related health information is available to and used by supervisors.	<ul style="list-style-type: none"> <li>a. Documentation that occupational health clinic personnel make regular appearances at supervisor orientation/training programs;</li> <li>b. Spot checks of supervisors to determine adequacy of awareness of job hazards;</li> <li>c. Documentation of periodic occupational health education classes presented to employees by supervisors.</li> </ul>
9. Small group education and counseling has been offered to overweight employees.	Records of group attendance and program plan.

TABLE 8

CONSOLIDATED CRITERIA LIST AND MEASUREMENT TOOLS SELECTED TO ASSESS COMPLIANCE WITH THE STANDARD APPLICABLE TO PROGRAM ELEMENT "PREGNANCY SURVEILLANCE PROGRAM" BY PANEL OF EXPERTS, U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

---

MEASUREMENT TOOLS

---

CRITERIA

1. Pregnant workers are appropriately evaluated regarding the impact of the job on the pregnancy (and vice-versa) within the first trimester of pregnancy.
2. Working conditions which could have an adverse effect on the pregnant employee have been made known to her.
3. Work exposures have been identified for all pregnant employees.
4. Functional job requirements (lifting, stooping, bending, etc.) have been identified for all pregnant employees.
5. Work assignments have been coordinated with the employee's obstetrician.
6. Job modifications are made when necessary.
7. A health and work history has been obtained on all pregnant employees.
8. Appropriate profile statement describing duty limitations has been provided to all pregnant military personnel.

- a. Entry in medical record which indicates that all job hazards were considered;
- b. Local Occupational Health Hazard Inventory (LOHHI).

Counseling entry in medical record.

- a. LOHHI;
- b. Entry in medical records stating work exposures.

Entry in medical record identifying functional job requirements.

- a. Written guidance from obstetrician regarding any duty limitations;
- b. Written concurrence from occupational health physician in medical record.
- a. Entry in medical record;
- b. Entry in personnel record;
- c. Employee interview;
- d. Worksite visit.

Entry in medical records.

Entry in medical record.

TABLE 8 (Continued)

CRITERIA	MEASUREMENT TOOLS
9. Assurance exists that prenatal care was initiated.	<ul style="list-style-type: none"> <li>a. Entry in medical record;</li> <li>b. Employee interview;</li> <li>c. Verification with obstetrician.</li> </ul>
10. The estimated date of confinement is included in the health folders of pregnant employees.	Entry in medical record.

A number of methods which have been employed to measure consensus with regard to quality assessment criteria have been documented in the literature. Studies employing such techniques are aimed at reducing proposed criteria lists by eliminating criteria which are deemed nonessential or not relevant. Various standards or cutoff points for criteria inclusion have been established by researchers based on levels of agreement among experts. For example, Brook included an explicit criterion item in his final list if at least two-thirds or more of the judges said that the item must be performed or must not be performed in the management of a specified condition.<sup>4</sup> Novick, et al. accepted only those criteria which were deemed "relevant" by 90 per cent of their study participants.<sup>5</sup> Osborne and Thompson considered a criterion to be recommended if it was rated "essential" by 85 per cent of responding participants.<sup>6</sup> In a fourth study, Wagner et al. established a 65 per cent agreement level as indicative of criterion endorsement.<sup>7</sup>

Using a similar standard setting concept and averaging the consensus cutoff points applied in the studies cited above, the figure of 75 per cent agreement on criteria contained in each list was established as a standard upon which to base an opinion of panel concordance. A review of Table 9 data, then, would indicate overall agreement only with respect to the pregnancy surveillance program element. The lack of overall concordance with respect to the other two program elements raises a question concerning the validity of these criteria lists.

Questionnaire responses among AEHA panelists were more positive than those provided by SEAD participants concerning the value of the consensus criteria development technique as an objective approach to program evaluation. The practicality of the implementation of this methodology at the installation level is questioned, however. Several respondents noted the fact that numerous

installation occupational health clinics are staffed with only one occupational health nurse and a part time physician, a situation which would presumably prohibit the use of this process. This is a reasonable comment, although it overlooks the fact that there are other installation personnel, such as the safety and civilian personnel officers, who play important roles in the local occupational health program and who could theoretically be called upon to participate in criteria development efforts.

AEHA participants seemed to be reasonably satisfied with the occupational health program evaluation methodology which they currently employ. They feel that combining a pre-survey questionnaire with a subsequent on-site verification visit allows for adequate evaluation at their level, the purpose of which is to determine program compliance with legal and regulatory requirements. Only one respondent commented upon program evaluation by installation personnel. This individual expressed the need for occupational health program evaluation at the local level, but stated that evaluation tools and techniques should be developed by higher authority and passed down to the installation occupational health clinic staff. The response supported the similar opinion previously provided by one of the SEAD panelists.

Footnotes

1 John W. Williamson, M.D., "Formulating Priorities for Quality Assurance Activity - Description of a Method and its Application," Journal of the American Medical Association, 239, No.7 (February 13, 1978), 632.

2 Ibid.

3 Edward H. Wagner, M.D. et al. "A Method for Selecting Criteria to Evaluate Medical Care," American Journal of Public Health, 68, No. 5 (May 1978), 469.

4 Avedis Donabedian, M.D., "Methods for Deriving Criteria for Assessing the Quality of Medical Care," Medical Care Review", 37 No. 7 (Fall 1980), 687.

5 Ibid.

6 Charles E. Osborne, Ed. D. and Hugh C. Thompson, M.D., "Criteria for Evaluation of Ambulatory Child Health Care by Chart Audit: Development and Testing of a Methodology," Pediatrics, 56, No. 4 (October, 1975), 641.

7 Wagner, p. 465.

### III. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Summary

This study was undertaken to test a proposed methodology for evaluating an occupational health program at a U.S. Army installation. Research objectives and techniques employed were largely inspired by and adapted from past and current quality assurance literature. The methodology was examined from the standpoint of validity, effectiveness in identifying program problems/weaknesses, and implementation feasibility. A major assumption which was made prior to study initiation was that standards of performance against which compliance assessment of each Occupational Health Program element and sub-element could be conducted will have been preselected.

A face-to-face panel technique was employed to develop explicit criteria and measurement tools for assessing and verifying compliance with performance standards. Two separate panels were formed. The first was composed of Seneca Army Depot Health Clinic staff members. The second panel consisted of Army Occupational Health Program experts assigned to the U.S. Army Environmental Hygiene Agency. Assessment criteria developed by each panel were compared in order to obtain an indication of criteria validity. Each member of both panels also completed a questionnaire intended to ascertain the feasibility of utilizing the methodology tested for installation occupational health program evaluation purposes.

#### Conclusions

##### Criteria validity

A comparison of criteria developed by the two panels reveals a divergence in thinking in several cases and raises questions concerning criteria validity. The SEAD final criteria list for assessing compliance with the preemployment physical examination standard tended to focus on process structure and mechanics,

while the AEHA listing was more oriented toward assessing compliance with regulatory requirements. The health education and counseling criteria lists also revealed a difference in orientation; the SEAD staff appeared to be more concerned with the presentation of general health education in contrast to the AEHA panelists, who were more interested in ensuring the provision of educational and counseling activities pertinent to identified workplace hazards. Only in the criteria lists developed to assess compliance with the pregnancy surveillance program standard was there a concordance which surpassed the 75 per cent standard.

Upon review of the results of this study, it must be concluded that the validity of criteria selected by SEAD panelists for assessing compliance with two out of the three given standards was not demonstrated.

The above conclusion may be interpreted by some readers as being indicative of different overall priorities which are placed upon the delivery of occupational health services by AEHA and installation personnel, respectively. This view may, in fact, be accurate. The researcher feels, however, that a generalization of this nature cannot be supported by the results obtained from this limited study, just as a definitive statement confirming criteria validity could not have been made even if criteria concordance exceeding 75 per cent had been observed.

#### Identification of problems/weaknesses

Implementation of the test methodology was clearly effective in identifying problems/weaknesses in the performance of selected occupational health program elements/sub-elements. Installation health clinic staffs who utilize the test methodology for problem identification purposes should be motivated to initiate corrective actions in light of the fact that the existence of problems/weaknesses indicates noncompliance with their own criteria.

### Methodology feasibility

In spite of at least one previously-discussed flaw in the questionnaire portion of this study, conclusions with respect to the feasibility of implementing the test methodology were quite clear. On the positive side, the process was found by the panel of experts to be workable and beneficial for the purpose of developing occupational health audit criteria. Both this group and the SEAD participants, however, felt the method to be impractical because of a perception that considerable time would be required to develop criteria and because of a lack of personnel at some installations to serve on criteria development panels. There may have also been a tendency toward negativism on the part of the SEAD staff because of the possibility of being tasked with an additional workload requirement if a feasible evaluation system were to be developed.

### Overall findings

From the information obtained as a result of this study, it is concluded that the methodology tested for evaluating an installation occupational health program could or would not be successfully implemented by installation personnel at the installation level. The methodology is not without practical value, however. Recommendations for its potential application are provided below.

### Recommendations

1. Establish performance standards for each Army Occupational Health Program element/sub-element, an action which was assumed to have been accomplished previous to the initiation of this research project. AEHA would be the appropriate agency to undertake this task; however, installation-level occupational health service personnel should be afforded the opportunity to comment on proposed standards prior to their being submitted for approval to Health Services Command and Department of the Army.

2. Develop objective, realistic, and measureable criteria in order to assess compliance with standards using the technique described herein. This process would be carried out by panels of selected experts such as those at AEHA and reviewed by larger groups of qualified individuals in order to determine validity through concordance measurement.
3. Require installation occupational health service staffs to periodically assess compliance with selected performance standards using developed criteria. Require assessment outcomes, including problems noted and corrective actions taken, to be periodically reported, possibly via a narrative attached to the Army Occupational Health Report. Problems of a quality assurance nature should also be reported in accordance with procedures established by the supporting MEDDAC.
4. Ensure that installation occupational health program evaluation activity is made a subject of interest during annual general inspections, especially in locations where the provision of occupational health services is a primary function of the health clinic.

APPENDIX A

ARMY OCCUPATIONAL HEALTH PROGRAM ELEMENTS

Army Occupational Health Program Elements

1. Inventory of occupational health hazards.
2. Industrial hygiene surveys.
3. Health examinations.
  - a. Preplacement examinations.
  - b. Periodic job-related examinations.
  - c. Administrative examinations (includes fitness for duty, return after illness, and disability retirement examinations).
  - d. Voluntary health maintenance examinations (includes specific disease screening programs).
4. Treatment of illnesses and injuries.
  - a. Job-related.
  - b. Emergency/palliative treatment of nonoccupational conditions.
5. Illness absence monitoring.
6. Chronic disease or disability surveillance.
7. Job-related immunizations.
8. Pregnancy Surveillance Program.
9. Epidemiological investigations.
10. Alcohol and Drug Abuse Prevention and Control Program.
11. Health education and counseling.
12. Radiation Protection Program.
13. Occupational Vision Program.
14. Hearing Conservation Program.
15. Safety and health inspections.
16. Medical records and reports.

Sources: United States Army Health Services Command Pamphlet 11-2, Occupational Health Program, July, 1978.

United States Army Environmental Hygiene Agency Technical Guide Number 124, Occupational Health Program Manual, 1982.

APPENDIX B

LETTER OF INSTRUCTION TO CRITERIA DEVELOPMENT PANEL PARTICIPANTS,  
U.S. ARMY HEALTH CLINIC, SENECA ARMY DEPOT, ROMULUS, NEW YORK



DEPARTMENT OF THE ARMY  
US ARMY MEDICAL DEPARTMENT ACTIVITY  
FORT DEVENS, MASSACHUSETTS 01433

REPLY TO  
ATTENTION OF

HSXF-0

29 December 1982

SUBJECT: Assessment of a Method for Evaluating an Occupational Health Program  
at an Army Installation

Panel Participants  
US Army Health Clinic  
Seneca Army Depot  
Romulus, NY 14541

Dear Participants:

Attached you will find a document which summarizes the background and methodology for conduct of the graduate research project about which I spoke with each of you last month. Although I have reorganized my thinking somewhat, the basic concept and study technique remains the same.

I request that you review the attached document and individually develop preliminary criteria and measurement tool listings as described in paragraph 2a-d. Feel free to use any references which will help you to develop/prioritize your criteria lists. The remainder of the study will be conducted when I return to the health clinic during the last week in January.

I greatly appreciate your interest and participation in this study. Please be aware that I consider this to be a very basic effort as opposed to a research masterpiece. At the conclusion of the criteria development process, I will pass out a questionnaire in order for you to comment on the acceptability and usefulness of the procedure.

Please call if you have any questions. I can be reached at Autovon 256-6894/6806.

Sincerely,

MARTIN J. FISHER  
MAJ, MSC  
Administrative Resident  
US Army-Baylor University Program  
in Health Care Administration  
Fort Devens MEDDAC

1 Incl

Assessment of a Method for Evaluating an  
Occupational Health Program at an Army  
Installation

---

1. BACKGROUND:

In April 1979, a new quality assurance standard was adopted by the Joint Commission on Accreditation of Hospitals (JCAH). The standard mandates that known or suspected problems which impact directly or indirectly on patient care be identified and resolved. Further stated is the requirement to develop written criteria which can be used to assess problems and measure compliance with achievable goals. Such criteria should be acceptable to the clinical staff and should, when applied to actual practice, be expected to result in improved patient care/clinical performance. AR 40-66, which discusses the scope and content of Army quality assurance activities, additionally requires that criteria should be realistic, objective, and measureable. The term "realistic" addresses the need for feasibility in meeting a given criterion. For example, it is useless to write a criterion which states that an item of information should be computerized when computers are not available. Objectivity refers to the necessity for a given criterion to be stated in terms sufficiently precise to preclude variance in interpretation. One writer states that the most desirable criterion is the one that requires an individual to exercise very little judgement and answer its implicit question with a relatively straight forward yes or no response. Finally, measureability is defined as the requirement for the answer to a given criterion's implicit question to be verifiable.

This study constitutes an effort to apply the concepts discussed in the JCAH quality assurance standards to the occupational health setting in order to evaluate an installation occupational health program. The importance of such an evaluation is discussed in US Army Environmental Hygiene Agency Technical Guide Number 124, Occupational Health Program Manual. The overall goal of the evaluation method to be assessed in this study is the identification of problems/shortcomings in the delivery of occupational health services. Although your health clinic may never be surveyed by the JCAH, the Health Services Command Inspector General has a significant interest in the quality of services which you provide and the method which you use to evaluate your own program's performance.

The evaluation method to be assessed is based upon several assumptions. The first of these is that professionals are more likely to accept criteria which they themselves have helped to formulate. The second is that criteria established by group consensus are more valid in assessing performance than individually-developed criteria. Finally, it is presumed that group-developed criteria will be more comprehensive in scope if individuals from more than one professional discipline participate in the development process.

2. STUDY METHODOLOGY:

a. For research purposes only, three occupational health program elements will be used as the basis for evaluation. These elements, or sub-programs, are re-

quired by any or all of the following: Army Regulations, Occupational Safety and Health Administration (OSHA) standards, or public law.

b. Broad performance standards against which the conduct of each occupational health program element can be assessed will be presented to you by the researcher. These are attached as Annex A. The standards are either published as stated or are renderings of program objectives/purpose statements found in applicable Army Regulations, technical guides, and related publications.

c. On an individual basis, please list criteria which you would use to assess compliance with each given standard. Try to view criteria as a means to evaluate installation, not just health clinic performance. Criteria should be written in objective statements and should be as specific as possible. Examples might be the following:

EXAMPLE 1: Criterion for a given Hearing Conservation Program Standard  
"Audiometer is calibrated in accordance with standards cited in TB MED 501".

EXAMPLE 2: Criterion for a given Occupational Vision Program Standard  
"Each employee who has been identified as working in an eye hazardous area has been issued safety glasses".

There is no limit to the number of criteria which you may use to conduct the assessment. Please keep in mind the requirements for realism, objectivity, and measureability.

d. In order to ensure measureability, please list next to each criterion, the measurement tool(s) which you would select in order to assess whether or not that criterion is being met. Using the previous examples, the following measurement tools might be listed:

EXAMPLE 1:	<u>Criterion for a given Hearing Conservation Program Standard</u> "Audiometer is calibrated in accordance with standards contained in TB MED 501".	<u>Measurement Tool(s)</u> 1. TB MED 501 2. Calibration sticker on Audiometer. 3. Most recent calibration form in file.
------------	--	--

EXAMPLE 2:	<u>Criterion for a given Occupational Vision Program Standard</u> "Each employee who has been identified as working in an eye hazardous area has been issued safety glasses".	<u>Measurement Tool(s)</u> 1. List of employees working in eye hazardous areas. 2. Medical records.
------------	--	---

e. Once you have developed criteria for assessing compliance with each standard, please arrange these in order of importance, with the most important criterion ranked number 1. Each criterion must be ranked in this manner.

f. Upon arrival at the health clinic, the researcher will collect and consolidate all criteria lists. One consolidated list of assessment criteria for each standard, in rank order of importance, will be prepared and distributed to each participant at the beginning of a face-to-face panel session.

g. The purpose of the panel session is to develop, for each standard, a final listing of no more than the ten most important assessment criteria as agreed upon by the group. Each final list of criteria will be selected as follows:

(1) Panelists will first be given an opportunity to individually review the consolidated, prioritized criteria list which the researcher has prepared. If, as a result of this review, any panelist thinks of any additional criteria which should be added to the consolidated list, these will be so added with the priority established by that panelist. No discussion or criticism of criteria or priorities will be permitted at this point.

(2) Time will now be allotted for clarification of listed criteria. Any panelist can ask questions to facilitate his/her understanding of each criterion. As before, neither discussion nor judgement will be permitted.

(3) Each panelist will now have the opportunity to individually re-weigh each criterion on the master list. When this has been accomplished, the researcher will collect and collate the new rankings and re-list criteria in the new order of priority.

(4) The second ranking of criteria will now be discussed. Judgements and criticisms are allowed during this step of the process.

(5) Each panelist will once again re-weigh each criteria. This will be the final ranking. The ten (or fewer if total criteria are less than ten) criteria with the lowest point totals will be listed in order of rank and will be considered to be the panels' choice of assessment criteria for evaluating compliance with the given standard.

(6) The measurement tools which were previously selected for assessment of each criterion will now be reviewed. Changes or additions will be made as determined by panel members.

h. As a final step, you will be given a questionnaire with which to record your views on the criteria development and occupational health program evaluation process. Please take time to fill it out, as it will be used to evaluate group acceptability of the process in which you will have participated.

3. Thank you in advance for your interest and participation in this study.

ANNEX A

Program Elements and Standards to be Assessed

1. Program Element: Preplacement examinations.

Standard: Preplacement examinations which are sufficiently inclusive to aid in suitable job placement will be provided whenever medical evaluation is necessary for work assignment.

<u>RANK</u>	<u>CRITERIA</u>	<u>MEASUREMENT TOOL (s)</u>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

(Continue on reverse if necessary)

II. Program Element: Health education and counseling.

Standard: There shall be a health education and counseling program to promote both general health maintenance and safe, healthful work practices.

<u>RANK</u>	<u>CRITERIA</u>	<u>MEASUREMENT TOOL (s)</u>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

(Continue on reverse if necessary)

III. Program Element: Pregnancy surveillance program.

Standard: Essential health supervision shall be provided to ensure that women workers or their pregnancies are not adversely affected by their work assignments.

<u>RANK</u>	<u>CRITERIA</u>	<u>MEASUREMENT TOOL (s)</u>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

(Continue on reverse if necessary)

APPENDIX C

CRITERIA DEVELOPMENT AND OCCUPATIONAL HEALTH PROGRAM EVALUATION  
QUESTIONNAIRE



APPENDIX D

LETTER OF INSTRUCTION TO CRITERIA DEVELOPMENT  
PANEL PARTICIPANTS,  
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY  
ABERDEEN PROVING GROUND, MARYLAND

DEPARTMENT OF THE ARMY  
US ARMY MEDICAL DEPARTMENT ACTIVITY  
FORT DEVENS, MASSACHUSETTS 01433

REPLY TO  
ATTENTION OF

HSNF-0

29 December 1982

SUBJECT: Assessment of a Method for Evaluating an Occupational Health Program  
at an Army Installation

Panel Participants  
Occupational and Environmental Medicine Division  
US Army Environmental Hygiene Agency  
Aberdeen Proving Ground, MD 21010

Dear Participants:

Attached you will find a document which summarizes the background and methodology for conduct of the graduate research project about which I spoke with each of you last month. The document has been sent to study participants at the US Army Health Clinic, Seneca Army Depot, Romulus, NY, the location which has been selected for on-site methodology assessment. Although I have re-organized my thinking somewhat, the basic concept and study techniques remain the same.

In order to obtain some indication of criteria appropriateness (or validity), I would like to repeat the study methodology described in paragraph 2 with a panel of "experts" similarly comprised of two (2) physicians and two (2) occupational health nurses. I would therefore request that you review the attached document and individually develop preliminary criteria and measurement tool listings as described in paragraph 2 a-d. Feel free to use any references which will help to develop/prioritize your criteria lists. In order to minimize time, please mail your criteria lists to me for consolidation (as discussed in paragraph 2e) prior to my anticipated 24 February arrival at AEHA for the panel phase of the study.

I greatly appreciate your interest and participation in this study. Please be aware that I consider this to be a very basic effort as opposed to a research masterpiece. At the conclusion of the criteria development process, I will pass out a questionnaire in order for you to comment on the acceptability and usefulness of the procedure.

HSNF-0

29 December 1982

SUBJECT: Assessment of a Method for Evaluating an Occupational Health Program  
at an Army Installation

Please call if you have any questions. I can be reached at Autovon 256-6894/  
6806.

Sincerely,



MARTIN J. FISHER

MAJ, MSC

Administrative Resident

US Army-Baylor University Program

in Health Care Administration

Fort Devens MEDDAC

Autovon: 256-6894/6806

1 Incl

Assessment of a Method for Evaluating an  
Occupational Health Program at an Army  
Installation

---

1. BACKGROUND:

In April 1979, a new quality assurance standard was adopted by the Joint Commission on Accreditation of Hospitals (JCAH). The standard mandates that known or suspected problems which impact directly or indirectly on patient care be identified and resolved. Further stated is the requirement to develop written criteria which can be used to assess problems and measure compliance with achievable goals. Such criteria should be acceptable to the clinical staff and should, when applied to actual practice, be expected to result in improved patient care/clinical performance. AR 40-66, which discusses the scope and content of Army quality assurance activities, additionally requires that criteria should be realistic, objective, and measurable. The term "realistic" addresses the need for feasibility in meeting a given criterion. For example, it is useless to write a criterion which states that an item of information should be computerized when computers are not available. Objectivity refers to the necessity for a given criterion to be stated in terms sufficiently precise to preclude variance in interpretation. One writer states that the most desirable criterion is the one that requires an individual to exercise very little judgement and answer its implicit question with a relatively straight forward yes or no response. Finally, measureability is defined as the requirement for the answer to a given criterion's implicit question to be verifiable.

This study constitutes an effort to apply the concepts discussed in the JCAH quality assurance standards to the occupational health setting in order to evaluate an installation occupational health program. The importance of such an evaluation is discussed in US Army Environmental Hygiene Agency Technical Guide Number 124, Occupational Health Program Manual. The overall goal of the evaluation method to be assessed in this study is the identification of problems/shortcomings in the delivery of occupational health services. Although your health clinic may never be surveyed by the JCAH, the Health Services Command Inspector General has a significant interest in the quality of services which you provide and the method which you use to evaluate your own program's performance.

The evaluation method to be assessed is based upon several assumptions. The first of these is that professionals are more likely to accept criteria which they themselves have helped to formulate. The second is that criteria established by group consensus are more valid in assessing performance than individually-developed criteria. Finally, it is presumed that group-developed criteria will be more comprehensive in scope if individuals from more than one professional discipline participate in the development process.

2. STUDY METHODOLOGY:

a. For research purposes only, three occupational health program elements will be used as the basis for evaluation. These elements, or sub-programs, are re-

quired by any or all of the following: Army Regulations, Occupational Safety and Health Administration (OSHA) standards, or public law.

b. Broad performance standards against which the conduct of each occupational health program element can be assessed will be presented to you by the researcher. These are attached as Annex A. The standards are either published as stated or are recordings of program objectives/purpose statements found in applicable Army Regulations, technical guides, and related publications.

c. On an individual basis, please list criteria which you would use to assess compliance with each given standard. Try to view criteria as a means to evaluate installation, not just health clinic performance. Criteria should be written in objective statements and should be as specific as possible. Examples might be the following:

EXAMPLE 1: Criterion for a given Hearing Conservation Program Standard  
"Audiometer is calibrated in accordance with standards cited in TB MED 501".

EXAMPLE 2: Criterion for a given Occupational Vision Program Standard  
"Each employee who has been identified as working in an eye hazardous area has been issued safety glasses".

There is no limit to the number of criteria which you may use to conduct the assessment. Please keep in mind the requirements for realism, objectivity, and measureability.

d. In order to ensure measureability, please list next to each criterion, the measurement tool(s) which you would select in order to assess whether or not that criterion is being met. Using the previous examples, the following measurement tools might be listed:

EXAMPLE 1: <u>Criterion for a given Hearing Conservation Program Standard</u> "Audiometer is calibrated in accordance with standards contained in TB MED 501".	<u>Measurement Tool(s)</u> 1. TB MED 501 2. Calibration sticker on Audiometer. 3. Most recent calibration form in file.
---	--

EXAMPLE 2: <u>Criterion for a given Occupational Vision Program Standard</u> "Each employee who has been identified as working in an eye hazardous area has been issued safety glasses".	<u>Measurement Tool(s)</u> 1. List of employees working in eye hazardous areas. 2. Medical records.
---	---

e. Once you have developed criteria for assessing compliance with each standard, please arrange these in order of importance, with the most important criterion ranked number 1. Each criterion must be ranked in this manner.

f. Upon arrival at the health clinic, the researcher will collect and consolidate all criteria lists. One consolidated list of assessment criteria for each standard, in rank order of importance, will be prepared and distributed to each participant at the beginning of a face-to-face panel session.

g. The purpose of the panel session is to develop, for each standard, a final listing of no more than the ten most important assessment criteria as agreed upon by the group. Each final list of criteria will be selected as follows:

(1) Panelists will first be given an opportunity to individually review the consolidated, prioritized criteria list which the researcher has prepared. If, as a result of this review, any panelist thinks of any additional criteria which should be added to the consolidated list, these will be so added with the priority established by that panelist. No discussion or criticism of criteria or priorities will be permitted at this point.

(2) Time will now be allotted for clarification of listed criteria. Any panelist can ask questions to facilitate his/her understanding of each criterion. As before, neither discussion nor judgement will be permitted.

(3) Each panelist will now have the opportunity to individually re-weigh each criterion on the master list. When this has been accomplished, the researcher will collect and collate the new rankings and re-list criteria in the new order of priority.

(4) The second ranking of criteria will now be discussed. Judgements and criticisms are allowed during this step of the process.

(5) Each panelist will once again re-weigh each criteria. This will be the final ranking. The ten (or fewer if total criteria are less than ten) criteria with the lowest point totals will be listed in order of rank and will be considered to be the panels' choice of assessment criteria for evaluating compliance with the given standard.

(6) The measurement tools which were previously selected for assessment of each criterion will now be reviewed. Changes or additions will be made as determined by panel members.

h. As a final step, you will be given a questionnaire with which to record your views on the criteria development and occupational health program evaluation process. Please take time to fill it out, as it will be used to evaluate group acceptability of the process in which you will have participated.

3. Thank you in advance for your interest and participation in this study.

ANNEX A

Program Elements and Standards to be Assessed

1. Program Element: Preplacement examinations.

Standard: Preplacement examinations which are sufficiently inclusive to aid in suitable job placement will be provided whenever medical evaluation is necessary for work assignment.

<u>RANK</u>	<u>CRITERIA</u>	<u>MEASUREMENT TOOL (s)</u>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

(Continue on reverse if necessary)

II. Program Element: Health education and counseling.

Standard: There shall be a health education and counseling program to promote both general health maintenance and safe, healthful work practices.

<u>RANK</u>	<u>CRITERIA</u>	<u>MEASUREMENT TOOL (s)</u>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

(Continue on reverse if necessary)

III. Program Element: Pregnancy surveillance program.

Standard: Essential health supervision shall be provided to ensure that women workers or their pregnancies are not adversely affected by their work assignments.

<u>RANK</u>	<u>CRITERIA</u>	<u>MEASUREMENT TOOL (s)</u>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

(Continue on reverse if necessary)

## BIBLIOGRAPHY

### Books

Daniel, Wayne W. Applied Nonparametric Statistics. Boston, Massachusetts: Houghton Mifflin Company, 1978.

Department of Environmental Health, Kettering Laboratory, University of Cincinnati. Standards, Interpretations, and Audit Criteria for Performance of Occupational Health Programs. Washington, D.C.: U.S. Department of Health, Education and Welfare, 1979.

Donabedian, Avedis, M.D. The Criteria and Standards of Quality. Ann Arbor, Michigan: Health Administration Press, 1982.

Donabedian, Avedis, M.D. The Definition of Quality and Approaches to its Assessment. Ann Arbor, Michigan: Health Administration Press, 1980.

Griffith, John R. "Quality Measures," in Measuring Hospital Performance. Blue Cross Association, 1978.

Joint Commission on Accreditation of Hospitals. Accreditation Manual for Hospitals 83. Chicago, Illinois: Joint Commission on Accreditation of Hospitals, 1982.

Joint Commission on Accreditation of Hospitals. The QA Guide - A Resource for Hospital Quality Assurance. Chicago, Illinois: Joint Commission on Accreditation of Hospitals, 1980.

### Articles and Periodicals

Baker, John H., M.D., "New Directions for Community Hospitals: Occupational and Preventive Healthcare," Health Services Manager, 14, No. 12 (December, 1981), 1-3.

Brook, Robert H., M.D., and Appel, Francis A. "Quality of Care Assessment: Choosing a Method for Peer Review," New England Journal of Medicine, 288, No. 25 (June 21, 1973), 1323-9.

Burke, Sharon M. "Audit: A Tool for Quality Assurance," Same-Day Surgery, 4 (April-May, 1980), 30-2.

Costanzo, G.A., and Vertinsky, Ilan. "Measuring the Quality of Health Care: A Decision Oriented Typology," Medical Care, 13, No. 5 (August, 1975), 417-31.

Crestoffel, Tom, and Lowenthal, Martha. "Evaluating the Quality of Ambulatory Health Care: A Review of Emerging Methods," Medical Care, 15, No. 11, (November, 1977), 877-97.

Davis, Richard L. "The Occupational Health Audit," Occupational Health Nursing, 23, No 2. (February, 1976), 10-13.

- Dershewitz, Robert A., M.D.; Gross, Richard A., M.D.; and Williamson, John W., M.D., "Validating Audit Criteria: An Analytic Approach Illustrated by Peptic Ulcer Disease," Quality Review Bulletin, 5, No. 10 (October, 1979), 18-25.
- Donabedian, Avedis, M.D. "Advantages and Limitations of Explicit Criteria for Assessing the Quality of Health Care," Milbank Memorial Fund Quarterly, 59, No. 1 (1981), 99-106.
- Donabedian, Avedis, M.D. "Criteria, Norms, and Standards of Quality: What Do They Mean," American Journal of Public Health, 71, No. 4, (April, 1981), 401-12.
- Donabedian, Avedis, M.D. "Methods for Deriving Criteria for Assessing the Quality of Medical Care," Medical Care Review, 37, No. 7 (Fall, 1980), 653-98.
- Hastings, Glen E., M.D.; Sonneborn, Robert, M.D.; Lee, Gail H.; Vick, Linda; and Sasmor, Louis, Ph.D., "Peer Review Checklist: Reproducibility and Validity of a Method for Evaluating the Quality of Ambulatory Care," American Journal of Public Health, 70, No. 3 (March, 1980), 222-8.
- Hill, Richard K. M.D. "Quality Assurance in Ambulatory Care," Primary Care, 7, No. 4 (December, 1980), 713-9.
- Hulka, Barbara S., M.D. "How to Evaluate Ambulatory Medical Care," American Journal of Public Health, 70, No. 3 (March, 1980), 217-8.
- Hulka, Barbara S., M.D. "Peer Review in Ambulatory Care: Use of Explicit Criteria and Implicit Judgements," Medical Care, 17, No. 3 Supplement (March, 1979), 1-73.
- Jessee, William, F., M.D. "Technique for Establishing Quality Assurance Priorities," Hospital Peer Review, 6, No. 6 (June, 1981), 70-2.
- Klutas, Edna May. "OHN's Administrative Responsibilities Grow," Occupational Health and Safety, 47, No. 3 (May-June, 1978), 44-7.
- Knight, Joan. "Community Health Care: Assuring the Quality of Preventive Care," Quality Review Bulletin, 6, No. 3 (March, 1980), 6-11.
- Koran, Lorrin, M., M.D. "The Reliability of Clinical Methods, Data, and Judgements," The New England Journal of Medicine, 293, No. 14 (September 25 and October 2, 1975), 642-6 and 695-701.
- Krieger, Gary, M.D. "Auditing Occupational Medicine Programs: A Structural Approach." Unpublished, manuscript, 1982.
- Lerner, Sidney, M.D. "Accreditation of Occupational Health Programs: Development and Validation of Criteria," American Industrial Hygiene Association Journal, 37, No. 11 (November 1976) 636-9.
- McAuliffe, William E., Ph.D. "Studies of Process-Outcome Correlations in Medical Care Evaluations: A Critique," Medical Care, 16, No. 11, (November, 1978), 907-30.

Merry, Martin D., M.D. "A Physician's Perspective on Proper Design of Quality Assessment Criteria," Quality Review Bulletin, 8, No. 10 (October, 1982), 3-4.

Mitchell, John H., M.D. "Peer Review and Occupational Medicine," Journal of Occupational Medicine, 20, No. 4 (April, 1978), 280.

Nelson, Carl W. "The Administrator's Role in Quality Assessment and Control," Health Care Management Review, 2, No. 1, (Winter, 1977), 7-18.

Osborne, Charles E., Ed.D., and Thompson, Hugh C., M.D. "Criteria for Evaluation of Ambulatory Child Health Care by Chart Audit: Development and Testing of a Methodology," Pediatrics, 56, No. 4, (October, 1975), 625-47.

Ostrow, Patricia C., and Jones, Elizabeth. "Peer Review for Nonphysicians," Hospitals, 53, No. 23 (December, 1979), 66-9.

"QA Standards Adopted for Ambulatory Health Care," Perspectives in Accreditation, No. 2 (March-April, 1981), pp. 4-5.

Romm, Frederic J., and Hulka, Barbara S., M.D. "Developing Criteria for Quality of Care Assessment: Effect of the Delphi Technique," Health Services Research, 14, No. 4, (Winter, 1979), 309-12.

Rubenstein, Lisa, M.D., Mates, Susan, M.D.; and Sidel, Victor W., M.D. "Quality of Care Assessment by Process and Outcome Scoring," Annals of Internal Medicine, 86, No. 5 (May, 1977), 617-25.

Taylor, Henry M. "Occupational Health Management - by Objectives," Personnel, 57, No. 1 (January-February, 1980), 58-64.

Thompson, Hugh C., M.D., and Osborne, Charles E. "Development of Criteria for Quality Assurance of Ambulatory Child Health Care," Medical Care, 12, No. 10 (October, 1974), 807-27.

Thompson, Hugh C., M.D., and Osborne, Charles E. "Quality Assurance of Ambulatory Child Health Care: Opinions of Practicing Physicians About Proposed Criteria," Medical Care, 14, No. 1 (January, 1976), 22-31.

Van de Venn, Andrew H., and Delbecq, Andre L. "Nominal Versus Interacting Group Processes for Committee Decision-Making Effectiveness," Academy of Management Journal, 14 (June, 1971), 203-12.

Wagner, Edward H., M.D.; Williams, Carolyn A., Ph.D.; Greenberg, Robert, M.D.; Kleinbaum, David, Ph.D.; Wolf, Susanne, M.P.H.; and Ibrahim, Michael, M.D. "A Method for Selecting Criteria to Evaluate Medical Care," American Journal of Public Health, 68, No. 5, (May, 1978), 464-70.

Wagner, Edward H., M.D.; Greenberg, Robert A., M.D.; Imrey, Peter B., Ph.D.; Williams, Carolyn A., Ph.D.; Wolf, Susanne H., M.P.H.; and Ibrahim, Michael A., M.D. "Influence of Training and Experience on Selecting Criteria to Evaluate Medical Care," American Journal of Public Health, 68, No. 16 (May, 1978), 871-6.

Williamson, John W., M.D. "Evaluating Quality of Patient Care: A Strategy

Relating Outcome and Process Assessment," Journal of the American Medical Association, 218, No. 4 (October 25, 1971), 564-9.

Williamson, John W., M.D. "Formulating Priorities for Quality Assurance Activity - Description of a Method and its Application," Journal of the American Medical Association, 239, No. 7 (February, 13, 1978), 631-7.

Williamson, John W., M.D., Braswell, Harriet R., M.L.A.; and Horn, Susan D., Ph.D. "Validity of Medical Staff Judgements in Establishing Quality Assurance Priorities," Medical Care, 17, No. 4 (April, 1979), 331-46.

Williamson, John W., M.D.; Braswell, Harriet R., M.L.A.; Horn, Susan D., Ph.D.; and Lohmeyer, Susan. "Priority Setting in Quality Assurance: Reliability of Staff Judgements in Medical Institutions," Medical Care, 16, No. 11, (November, 1978), 931-40.

#### U.S. Government Publications

Army Regulation 40-5. Health and Environment. 25 September 1974.

Army Regulation 40-66. Medical Record and Quality Assurance Administration. 1 November 1982.

Department of Defense (DoD) Manual 6055.5 M. Occupational Health Surveillance Manual. 26 July 1982.

Department of Health and Human Services (DHHS) (NIOSH) Publication Number 81-123. Occupational Health Guidelines for Chemical Hazards. January 1981.

Department of Health, Education and Welfare, Office of Professional Standards Review. PSRO Program Manual. Washington, D.C.: U.S. Government Printing Office, 1974.

Federal Personnel Manual (FMP), Chapter 339. Qualification Requirements (Medical).

Klutas, Edna May. Occupational Health Program Manual (Technical Guide No. 24). Aberdeen Proving Ground, Maryland: United States Army Environmental Hygiene Agency, 1982.

Technical Bulletin (Medical) 501. Hearing Conservation. March, 1980.

Technical Bulletin (Medical) 502. Occupational Vision. December 1981.

United States Army Environmental Hygiene Agency. Occupational Health Nursing Responsibilities (Technical Guide No. 005). Aberdeen Proving Ground, Maryland: United States Army Environmental Hygiene Agency, undated.

United States Army Environmental Hygiene Agency. Occupational Health Program Survey Questionnaire. Aberdeen Proving Ground, Maryland: United States Army Environmental Hygiene Agency, 1974.

United States Army Environmental Hygiene Agency. Occupational Health Survey No. 65-32-0092-83, Fort Devens, Massachusetts, 2-6 August 1982. Aberdeen Proving Ground, Maryland: United States Army Environmental Hygiene Agency, 10 November 1982.

United States Army Environmental Hygiene Agency. Recommendations for Periodic Job-Related Examinations for Selected Occupations, Appendices G and H. Aberdeen Proving Ground, Maryland: United States Army Environmental Hygiene Agency, 1978.

United States Army Health Services Command Regulation 11-4. HSC Operating Program - Preventive Medicine Guidelines for Implementation of a Preventive Medicine Program for MEDDAC/MEDCEN. 22 June 1982.

United States Army Health Services Command Pamphlet 40-2. Occupational Health Program. July, 1978.