Summary of Workshop #2: Personnel

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Key Questions:

1) Are the knowledge and skill requirements for personnel currently used by the laboratory community adequate to ensure personnel competency?
2) How can knowledge and skill requirements and personnel competencies be better assessed in the future?

Personnel issues, particularly personnel standards and competencies, have been one of the central issues in assuring the quality of laboratory practices. Personnel standards combined with regulations for quality control and proficiency testing are the backbone of the Clinical Laboratory Improvement Act (CLIA) of 1967 and the 1988 CLIA Amendments.

Examining the connection, however, between personnel standards and the quality of laboratory testing is a difficult exercise. Numerous confounders and interactions exist. Personnel competencies can be potentiated or negated by the quality of the administrative structure, technologic sophistication of the instrumentation, rigor of the quality assurance program, and ability of the system to optimally use and benefit from quality laboratory testing. Research examining the relationship between personnel qualifications and laboratory outcome does not control for these factors, nor conduct prospective studies, and nor incorporate clinically appropriate outcome measures.

This leaves the question of the connection between personnel standards and quality laboratory testing unanswered and subject to political processes. Some argue that personnel standards must be eliminated because no well-designed study documents that they make a difference. Others argue the reverse: personnel standards must be retained because no study demonstrates that relaxing the standards would not harm patients. Therefore, until well-designed and controlled prospective studies are completed, the future is more likely to be guided by political power rather than scientific evidence.

Five panel members provided guidance on these issues. Dr. Karen Karni, University of Minnesota, presented two studies: 1) laboratory staffing patterns in Minneapolis-St. Paul area hospital and HMO laboratories and 2) the error rates in 19 satellite HMO laboratories and their distribution between AS- and BS-prepared laboratorians. Dr. Barbara Castleberry, American Society of Clinical Pathologists Board of Registry, discussed a 10-year longitudinal project being undertaken by this board. The project will yearly survey a cohort of individuals

who took the 1993 examination to determine their job characteristics, satisfaction, career advancement, and other issues. Dr. Michael Peddecord, San Diego State University, described a task analysis project and the input that was received from a focus group of supervisors queried about personnel characteristics which should produce superior performance in the laboratory. The fourth panelist, Mr. John Kraft from the U.S. Office of Personnel Management, discussed the need for teams, team cooperation, and team-building skills for the rapidly changing environment. Dr. Glenda Price, Spelman College, concluded the panel with a summary of the core, cross-disciplinary competencies recommended by the Pew Commission for the Health Professions for all health professions; she then discussed the implications of these recommendations to the educational preparation of future laboratorians.

Among the topics raised in the discussion following the panelists' presentations, workshop participants questioned the validity of research studies which make associations between personnel standards and performance in laboratory proficiency testing programs. They concurred that proficiency testing is a flawed proxy for directly measuring the quality of daily laboratory testing within the context of the total testing process. To judge the appropriateness of personnel standards by outcomes achieved on proficiency testing samples is an incomplete assessment in that it evaluates only the analytical component. Even if proficiency testing samples are truly processed as routine specimens rather than marked for special treatment, proficiency testing still fails to capture the expertise needed in the pre-analytical and post-analytic portions of the total testing process. The participants agreed that pre- and post-analytical factors must be included in the assessment of competencies.

With this in mind, the workshop participants examined the key questions. Discussions led to agreement that these questions needed to be broadened to include the total testing process as well as economic and social factors that influence the current changes within the American health care delivery system. The 22-member workgroup divided into four subgroups to further refine the question, and then convened as a committee-of-the-whole to develop a composite question.

The revised and consolidated question addressed by the workgroup is:

Recognizing customer needs, dynamic health care environment, and various practice settings, what are the required knowledge, skills, abilities/values, and other characteristics (KSAOs) to ensure effective, efficient, value-added performance of all laboratory processes (total testing process) impacting the quality and cost of patient care?

We reconvened in our four subgroups to determine what research agenda was necessary to answer our revised question. Each subgroup developed its own agenda which was shared with the committee-of-the-whole. Group consensus was then reached on the highest priority topics. A 2-part agenda resulted: total testing performance, and management/supervision.

Research agenda to ensure competency throughout the performance of the total testing process

1. What personnel characteristics and behaviors contribute to an effective outcome (value-added patient care)? Based on early qualitative research concerning the

characteristics of superior laboratory staff, personnel characteristics, behaviors, and values appear to make a difference. However, what are these characteristics, are they teachable, and do they make a difference in achieving an effective outcome for the patient? Do they improve the analytic result, but more importantly, do they add value to the total testing process and improve patient outcome?

And what is that extra value? How would patients' outcomes differ with and without quality laboratory performance? How can we identify that extra value and maximize the incremental contribution?

2. For each phase of testing, what are the measures of quality performance? We had quantitative measures to evaluate the analytic component of laboratory testing, but what are the clinically relevant measures for the pre- and post-analytical components?

3. What is the role of laboratory personnel in improving laboratory utilization and the interpretation of test results? If we can identify measures of quality performance, what is the role of laboratorians and what is the role of clinicians, nurses, computers, and administrators in improving the total system of laboratory testing? When the role of the laboratory is defined, how can measuring these factors be incorporated into our total quality assurance system?

4. What are the KSAOs needed to improve interventions in pre- and post-analytic phases?

- What basic and applied medical science knowledge/skills will be needed?
- What communication skills will be needed?
- What "people-skills" will be needed to interact with the health care team?

Once we identify our roles, what are the KSAOs needed to ensure we perform these roles well? Participants agreed that these roles will extend beyond our scientific knowledge and must include communication skills both to transmit laboratory information as well as to be effective members of teams within the laboratory as well as effective members of the more comprehensive health care team. We must communicate better to improve laboratory utilization and test interpretation.

5. Are the current KSAOs appropriate to develop and implement actions to improve test utilization and interpretation? Once we identify what is needed, next we must determine if the present KSAOs are appropriate. Should new educational modules or continuing education programs be developed to achieve the identified KSAOs?

6. Is there variation in performance/quality among practice sites? How will we measure that variation? What other methods exist or must be developed that extend beyond proficiency testing? Are different levels of performance acceptable in different sites? What is the incremental gain of increasing laboratory quality across sites?

7. What systems knowledge is needed to manage the testing process to improve:

- overall system performance?
- the analytical outcome?

8. Does the level of training lead to the reduction of errors in all phases of testing? This is the final summative question. If we identify how laboratorians can make a

difference in improving all phases of the total testing process, if that the improvement does lead to better patient outcomes, if the KSAOs needed to achieve that improvement can be identified and taught, does the inclusion of this material and the level at which it is taught result in a reduction of errors? And does a reduction of errors lead to an improved patient outcome?

Research agenda for management/supervision competency

9. What skills/knowledge are needed to plan, organize, direct, and control outcomes-based processes? Supervisors and other management personnel also will need to examine the KSAOs needed in an outcomes-based laboratory effort. These extend beyond the technical expertise and may include interpersonal skills and administrative abilities to plan, organize, direct and then control laboratory processes which have their focus of improved patient outcomes, rather than an analytically precise and accurate laboratory result.

10. How do we assess the KSAOs of personnel supervising off-site testing? Much laboratory testing will be performed off-site without direct supervision. This could include bedside testing as well as testing in the home, physician office laboratories, ambulatory clinics, and wellness fairs. What supervisory skills are needed for these environments, how do we assess these skills, and how do we assess the KSAOs of the individuals performing in these off-site testing locations?

11. Who evaluates whom in a team structure? By its very nature, a team consists of a group of individuals. If the team is evaluated, do its members need to be individually evaluated also? Within a team, who evaluates whom?

Research agenda for evaluation of competency

12. What competency assessment tools are most effective/accurate in measuring laboratory scientists' ability to add value to a positive patient outcome? We have a measurement problem. Central to many of our previous research questions is a need to develop accurate and effective competency assessment measures. How can we determine if laboratorians add value to a patient outcome if we only have certification examinations and proficiency testing results as competency measures?

These 12 questions map a comprehensive research agenda which will require qualitative descriptive studies as well as prospective controlled trials. Much preliminary work must be performed if we are to operationalize the concept of the total testing process and build the identified competencies into the preparation of present and future laboratorians. In an environment of constrained health care dollars, we must demonstrate that these revisions in the nature by which we do our business make a contribution to a more efficient and effective health care delivery system. Only then can we link identified and necessary personnel competencies to a value-added contribution by the laboratory community to improved patient care.