Cost-Effective Protocols for Laboratory Testing

The pressure to achieve cost reduction in the provision of laboratory services is growing nationwide, even worldwide. Accordingly, many attempts are being made, and reported, that illustrate the diverse ways being used to achieve cost savings. At the same time, these efforts are being made in a climate where there is an increasing need to couple the cost-reduction measures with improvement in efficiency, particularly in regard to turnaround time (TAT) for reporting laboratory results. For some laboratories, these efforts are being pursued by consolidation of laboratory testing into a single entity that meets all requirements 24 h a day; in others, efforts at reengineering include drastic restructuring of the testing location and major modification to operating procedures and protocols.

In any event, it is imperative that clinical laboratories participate in exercises to modify existing practices and report their findings so that effective improvement can be imitated and become widespread. The report by Steffes et al. [1] in this issue addresses several important elements of the problem faced by laboratories. The reported claims are impressive. They present information that indicates a dramatic 80% reduction in TAT, an impressive savings to their institution of $400,000 per annum, and less-frequent blood collections and utilization. The report is based on a study involving intensive care units (ICUs) with an average occupancy of 32 patients. The authors devised custom-made request forms for each ICU that permitted preordering of tests as long as 24 h beforehand and established protocols that urged the ICUs to order tests on alternating schedules (i.e., different predetermined collection times were requested for each unit). In addition, they established a special "on-site" laboratory on their surgical ICU that provided rapid assays using whole-blood technology only (i.e., for blood gases, electrolytes, glucose, and hemoglobin). By addressing the issues of rapid assays and use of customized forms permitting preordering, and by emphasizing reduced blood collections, the authors claim to have reduced TATs for routine work from 30 to 5 min and for stat requests from 15 to 2–3 min. On the basis of their new protocols, the authors report reductions of as much as 80% in form generation and as much as 63% of blood volumes.

Are these efforts worthy of imitation, and are the substantial claims transferable to other institutions? In many teaching hospitals with busy ICUs, laboratories serving the needs of critical care are already established. These frequently provide very rapid TATs (e.g., ~5 min). The efficiency of this type of service is reliant on transport and reporting systems, but for those laboratories with pneumatic tube transport and on-line reporting, this type of efficiency has already been achieved. For those with a less-convenient location and less-efficient transport systems, the establishment of an on-site laboratory in the busiest ICU appears most appropriate.

The use of customized forms described by Steffes et al., coupled with their testing schedules, creates an exciting scenario. Provided that the sample-processing staff are not confused by a plethora of customized forms, the benefits of convenience for the requestor seem obvious. Certainly, the conservative approach that requires all clinical units to use the same forms is still adopted by too many laboratories. Many laboratories have adopted customized forms for transplantation units, emergency rooms, and critical care areas, but the example provided by Steffes et al. is useful.

The amount of savings deriving from new protocols, operating procedures, and changing practices is difficult to quantify, particularly when the changes involve multiple departments, clinical units, and supplies. As a result, data that lay claim to savings in this area are subject to many interpretations. Inevitably, the phrase "estimated costs" is included in too many articles, which makes the authors' conclusions difficult to substantiate or question. When estimates are small numbers subject to extrapolation algorithms, the data become still more difficult to confirm by independent study. Thus, we must interpret the impressive savings reported by Steffes et al. as estimates only, uniquely applied to their environment and situation. Unfortunately, the authors provide little support for their use of estimates, which grow from an estimated $15 unit cost to an annual savings of $75,000. Furthermore, the saving of 10 min by their surgical ICU staff when processing orders provides the basis for another annual savings of $70,000. In reality, only savings that reduce the critical mass of unit staff can be translated into real savings.

The approach used by Steffes et al. is laudable and well worthy of imitation in institutions that have not yet applied themselves to cost-reduction measures in this area. However, before embarking on major reorganization of laboratory services, all options should be considered—including establishment of on-site laboratories conveniently located in (or next to) ICUs, creation of efficient transport systems to serve central laboratories, and adoption of user-friendly test-requesting documentation. The realization that analytical operations constitute the minor component of many laboratory services has been accepted slowly. Today, with cost-cutting as the motivation, most laboratory managers realize that analysis is invariably the easy part of providing a low-cost, efficient service.

A recent publication by Winkelman and Wybenga [2] runs counter to the proposal by Steffes et al., but is equally supported by financial data. The Winkelman and Wybenga study, performed in a major teaching hospital, clearly advocates the use of central laboratories for provision of stat and critical care laboratory services and presents a good argument for the elimination of on-site laboratories. However, their study did not address the benefits of reducing the frequency of blood collection or the volume of blood required by the laboratory. The statistics presented by Steffes et al. are most impressive in this regard.

A major factor not considered by Steffes et al. is the growing role of point-of-care analysis and its impact on the provision of laboratory services in the critical care environment. This subject is still controversial, and contrasting viewpoints exist [3,4]. The choice of technology that can meet the demanding requirements of convenience and quality at point of care is still limited, and the economics of device employment has yet to be quantified with certainty. Nevertheless, new technology does appear to provide useful service in defined areas and will markedly influence the critical care environment during the next decade [5]. In the meantime, the approach advocated by Steffes et al. has merit and substance.
References


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