

Hospital Systems That Put Patients at Risk

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The number of patients who accidentally die or are injured in our nations hospitals is roughly equivalent to three jumbo jet crashes every other day . I'm sure most of you have heard these statistics before, yet each time I hear numbers like these I'm amazed that a country rich in HEALTH CARE like ours does not do better. There are, however, ways that can improve this statistic and at the same time reduce the costs of delivering good health care in the United States. The following three points suggest an approach to start to improve the standard of care in our nation's hospitals:

- Standardize Procedures
- Improve Computer Systems
- Improve Communication Between Patient Care Areas

Put very simply, we need to examine the structure, processes and outcomes of the clinical care provided to the patients in our hospitals. A recent article in the Journal of American Medical Association (JAMA) states that errors in drug therapies result in 200,000 injuries / year and that preventable medication errors occur in 2 of every 100 hospital admissions. The statistics quoted for pharmacy are measurable, but how do we examine the errors that occur in our laboratories (Table 1)?

As we understand the possible causes of some of these errors, the ability to change

the process becomes abundantly clear (Table 2).

Once again, the focus should be on the systems, processes and outcomes.

Changes in Health Care and the Effects on Quality Care

As the reimbursement dollar shrinks, we begin to experience rapid transformation in the health care industry. Thus exists the opportunity to transform the systems currently in place to improve the quality of care. Some of the more prominent changes and their anticipated effects are listed in Table 3. We should examine each of these change/effect scenarios independently.

In an effort to reduce costs in the health care industry many corporations and individual hospitals are forming alliances or *merging*. The larger the entity the more opportunity to reduce costs through volume purchasing and sole source contracts with companies that are at the same time buying new businesses. The trend in both hospitals and manufacturers is "larger is better." Lower prices for health care products are necessary, but the real cost savings will only come through the proper utilization programs. Standardizing on a single product will present the opportunity for the staff to familiarize themselves with that product and will require less training on use.

Secondly, the inevitable shift to *managed care* will place the emphasis initially on

PROBLEM	RESULT
Test Order or Transcribing Errors	Clinical Treatment Delayed
Blood Drawing Errors	Clinical Treatment Not Appropriate
Improper Quality or Quantity of Specimen	Clinical Treatment Delayed
Malfunction of Instrument	Clinical Treatment Delayed
QC or Instrument Calibration Error	Clinical Treatment Delayed
Test Reporting Error	Clinical Treatment Not Appropriate

Table 1. Potential result of errors that occur in the laboratory.

ERROR	POSSIBLE CAUSE
Blood Drawing Errors	Improper Training of Personnel
Improper Quality/Quantity of Specimen	Improper Training of Personnel
Malfunction of Instrument	Improper Maintenance of Equipment
QC or Instrument Calibration Error	Inadequate Equipment
Test Reporting Error	Poor Computer Systems

Table 2. Possible cause of laboratory errors.

CHANGES	EFFECTS
Hospital Mergers	Create Opportunity to Lower Costs
Shift to Managed Care	Effects Remain to be Seen
Consolidation of Services	Increase Quality of Outcomes
Downsizing of Staff	Do More with Less
Increase Emphasis on Automation/IS	Increase Quality of Outcomes

Table 3. Effect of changes in health care industry.

reducing operating costs and eventually to more emphasis on "Outcomes Measures." With the focus on outcome measures, the logical change in processes and improvement in information systems will result in increased quality of patient care. To be competitive in the managed care market, the providers must be able to produce clinical data on their patients and relate those data to the clinical outcomes. The focus here is on "outcome measures." Although many people agree that it will be the goal of the future in health care, very few experts have developed the process to monitor and document meaningful outcomes.

As most of us realize, the leading consultants in health care today are all advocates of *consolidation*. As we also understand, this project is much easier talked about than implemented. As the alliances and merged hospital networks work toward consolidation, the result is a higher volumes of testing, an example of a system change that will ultimately result in increased quality of care. The more tests performed by the staff, the more competent the staff will be. As the test volumes reaches a critical mass, the next logical step in the process is robotics and automation. This is the place where we begin to see the real savings and increase in the quality of the testing.

Even before the consolidation of services process moves into the automation process, the *downsizing* of the *staff* is inevitable. The opportunity for the medical technologist to become involved with yet another system change to improve quality exists. Medical Technologists will have the opportunity to work on test utilization programs with the physician, patient focused care teams, and information system teams that improve the communication between patient care areas and physicians and hospitals.

The primary goal that we should be working toward, as we strive to improve health care systems, is to deliver the *right result to the right person at the right time*. Information is the product that the laboratorian of the future produces. Automation and robotics will be the tools we need to achieve that goal. The positive effects that automation will have on laboratories of the future are:

- Improved turn around times
- Lower the overall error rate
- Ability to increase volume without increasing staff
- Less specimen required
- More emphasis on information, less on systems

COLUMBIA/HCA COMPANY PROFILE

HOSPITALS	326
BEDS	81,000
EMPLOYEES	212,000
ANNUALIZED REVENUES (billions)	\$17
OUT PATIENT SURGERY CENTERS	127
PHYSICIAN OFFICE PRACTICES	800

All of the changes required of a successful health care system in the future remain to be seen. The emphasis must be on changing the systems as they currently exist. As we see the industry in transformation the goals of the most successful organizations are: increasing efficiency and productivity, integrating all major services, maintaining and improving quality of care, and reducing costs to be price competitive. Most important is to be able to respond to and embrace change. Columbia Health care is the largest existing corporation worldwide, and because of this size we have been very successful in reducing the costs for the entire

system. Reducing costs, however is only the first step. The significant savings potential will be realized when the utilization programs and the consolidation efforts are successful. The four strategic goals of the Columbia Material Management Strategy are:

- Reduce costs through volume contracts
- Standardize products to reduce waste
- Partner with physicians and suppliers
- Measure and improve utilization of products

The way to improve quality is to set standards and measure and improve from a benchmark. The difficulty with the laboratory setting standards is the wide variations of instruments, test methodologies, and the utilization in the reagents, etc., required to produce the test results. As Columbia reaches the goal of standardizing the products, the company will be in a position to benchmark these procedures. Imagine a network of hospital laboratories in a region with identical laboratory instrumentation, identical lots of reagents and quality control material, identical training programs for the technical staff, identical reference ranges for the entire market (same population), identical information systems with the electronic medical record where patient data will be available to the physician in all settings in the market. The following (Figure 1) represents a simplified structure charting the consolidation strategy for Columbia laboratories.

The Columbia strategy for consolidating the laboratories in a network stress the following key steps:

- Sharing of esoteric tests
- Linking the information systems

- Common bidding process for residual reference lab tests
- Common equipment and supplies
- Developing "Centers of Excellence," sharing professional expertise in the company
- Common outreach services in a market, to include marketing, sales, billing and client services

In a recent article in JAMA entitled *Systems Analysis of Adverse Drug Effects*, the author lists 16 major systems failures. The following is a similar list that can be compared to systems that need radical improvement in the hospital laboratory:

CAUSES OF LAB ERRORS SIMILAR TO CAUSES OF ERRORS IN THE PHARMACY

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|-------------------------------------|--|
| 1) Lab Test Knowledge | Physicians unaware of a specific lab test and when to order |
| 2) Patient Information Availability | Patient history was not available to the clinician when needed |
| 3) Order Transcription | Manually transcribed orders leads to misinterpretation |
| 4) Interservice Communication | Poor communication between departments in the hospital |
| 5) Device Use | Improper specimen container for collection |
| 6) Collection Times for Drug Levels | Dosing times are not a standard protocol in all hospitals |
| 7) Standardization of Procedures | Different procedures exist from one unit to another in hospitals |
| 8) Transfers/Transition Problems | Identification errors when patients are transferred |
| 9) Conflict Resolution | Many of the staff unaware of policies or procedures |
| 10) Staffing /Work Assignments | Inability to match staffing to the current clinical load |
| 11) Feedback on Error Resolution | Staff was not educated to the follow up on errors |

CONSOLIDATION

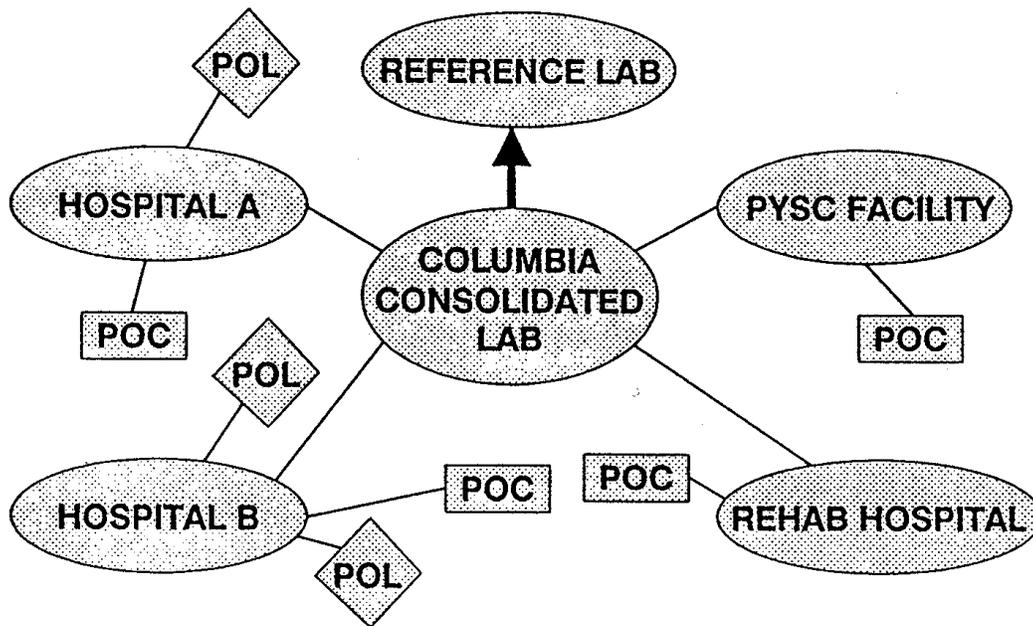


Figure 1. Consolidation strategy for Columbia laboratories.

This exercise proves that of the 16 system problems documented in the JAMA article, 11 of them can be directly related to the laboratory as well as the pharmacy. If such major system problems exist that are similar in most of the ancillary departments, why do we not form interdepartmental committees to identify and resolve the problems common to these departments. In a separate article in JAMA the author suggests that ADE's increase patient care costs by \$2000 per day. Therein lies the opportunity to decrease costs by improving the quality in our hospitals.

In summary, the restructuring of the reimbursement system in the health care industry is inevitable. What is not so

obvious are the opportunities that present themselves to better the delivery systems. In short, we should forget the old way of doing business, examine the processes, locate the causes of inherent errors, maximize the use of computer systems and proceed to measure the improvement. Once we have the ability to standardize the processes and computerize the approach, we will have good access to data. When the health care networks are functioning as one, instead of individual business units competing for the reimbursement dollar in their market, we will have the ability to follow a patient through the continuum of care and to compare the outcomes of the various treatments in each clinical setting.

References

1. Bates DW, Cullen DJ, Laird N, et al. Incidence of adverse drug events and potential adverse drug events: implications for prevention. *JAMA*. 1995;271:20-34
2. Leaps LL, Bates DW, Cullen DJ, et al. Systems analysis of adverse drug events. *JAMA*. 1995;274:35-43