

## Waste, Defects, and Rework

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The U.S. health care system delivers extraordinary life-saving, life-extending, and symptom-relieving care using a staggering array of technologies. The routine application of fiberoptic procedures, digital imaging technologies, and innovative pharmaceuticals is providing enormous benefit to our patients. Yet no one who has observed health care processes is likely to marvel at their efficiency or reliability. In fact, the waste, defects, and rework are generally obvious even to the most casual observer. The most serious such defects, errors contributing to mortality, were thrust into the national consciousness by the Institute of Medicine (IOM) with frightening statistics and powerful analogies in its 2000 report *To Err is Human* [1]. In *Crossing the Quality Chasm*, the second IOM report in the series on quality of health care in America, the authors highlighted the systemic issues responsible for the “chasm” between our tools and knowledge on the one hand and care delivery on the other [2].

The investment of money and energy in improving health care historically has been heavily weighted toward technology. High-quality care has been assumed to be the inevitable result of highly trained, motivated individuals seeking individual perfection and working largely independently. The technology and science investments have been in the instruments of care—eg, pharmaceuticals, imaging modalities, surgical instruments—and not in the delivery of care. Sophisticated process improvement methodologies such as Six Sigma and the Toyota production system have, until recently, largely been ignored in health care. Similarly, there has been a striking contrast between the routine application of information technology in the instruments of care and the relatively primitive use of information technology in the process of delivering care. The result is a situation where the complex, expensive, and potentially dangerous instruments of care are orchestrated without integrated decision support using poorly specified and often ambiguous processes and communication tools. The illegible handwritten prescription or order is only the most glaring example.

In this issue, Giella et al report on tackling what appeared to be a simple problem: many routine laboratory test results that should have been available for physician morning rounds were not. The sequelae of this problem were significant—delays in care, extra work on the part of nurses to contact

physicians later in the day, duplication, and frustration among all parties (ie, waste, defects, and rework). At the heart of the problem lay a fundamental communications issue. No one really knew when the physician wanted the results. Moreover, even if the unit clerk knew, there was no way to communicate the desired result time to the laboratory. Unit clerks developed individual work arounds, including the ordering of scheduled lab tests “stat.” The consequences were predictably chaotic, with phlebotomists and the laboratory unable to distinguish “true stats” from routine tests ordered stat.

In concept, the solution of Giella et al is deceptively simple: find out when the physicians typically round on a nursing unit and draw the specimens early enough to have the results available by that time. As always, implementation was more challenging. Nevertheless, with the disciplined application of performance improvement methodology, their team was able to achieve impressive improvements in these processes. In the longer term, the use of computerized physician order entry will allow the question of “when are the results needed” to be posed directly to the ordering physician, thereby streamlining the process and reducing the guesswork.

We live in what could be a “golden age” of health care. The human genome has been sequenced, and genomics and proteomics offer the hope of new cures and truly individualized treatment. Pharmaceuticals, fiberoptics, and advanced imaging modalities enable us to provide greater benefits less invasively. Yet there is wide frustration over the chasm between the care we have now and the care that is possible. The increasing use of sophisticated process improvement methodologies in health care coupled with the implementation of information technology for the delivery of health care offer reasons to be optimistic that this chasm can be eliminated and the potential golden age can become a reality.

### References

1. Committee on Quality of Health Care in America. *To err is human: building a safer health system*. Washington (DC): National Academy Press; 2000.
2. Committee on Quality of Health Care in America. *Crossing the quality chasm: a new health system for the 21st century*. Washington (DC): National Academy Press; 2001.

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