

Industrial Systems Engineering and Health Care

Materials Management and Production Processes Breakout Group —Session Summary

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FIRST SESSION

Dr. Schneller asked the breakout group members to define and describe materials management. They agreed that it involves the ordering and delivery of health care materials, with a focus on the efficiency of the supply chain. Important elements include procurement, delivery, inventory/resupply, reliability, risk, a delivery network, stewardship of information, privacy, security, safety, and efficacy. Materials management begins with the manufacture of products and proceeds, through a supply chain, to use. It is a strategic health care function for which research is lacking. For better research, we need uniform data sets, an understanding of linkages, and dedicated publications.

The breakout group recognized that some tools and methods from other fields (for example, bar codes) have not been applied and tested systematically. Other needs include the identification of products and better standards. Challenges to progress include inhibition by local legacy systems and discontinuities in supply chains. Materials must become trackable, and we must reduce transaction costs. Incentives and decisionmaking are keys. The group members developed the following list of desired qualities and processes for the future:

Products

- Standardization
- Identification of products (universal product codes, or UPCs)
- Tracking
- Safety of products and processes

Delivery

- Providing incentives
- Creating linkages to medical records
- Purchasing distribution
- Outsourcing/insourcing.

The group recognized needs for new models, cross-fertilization, training, pilot studies, and regulatory policy (setting standards, mandating the use of registries).

SECOND SESSION

Future Research

In its second session, the breakout group addressed components of a research agenda, producing the following goals, scope, challenges, recommended approaches, milestones, resources, and ideas for dissemination.

Goals. The goals of materials management are to inform and transform policies, processes, and procedures that ensure “ideal flow” that will result in greater efficiencies, transparency, and patient outcomes.

Scope. Materials management research should feature the classification and coding of materials and products, the identification and testing of supply-chain and health care production best practices (flow of money, scheduling of people), and the evaluation of efficiency of processes.

Challenges. Future efforts must address the lack of opportunities for publication and the need to integrate industrial systems engineering research.

Research approaches. We should develop a center or centers for industrial systems engineering for health care. We should support work by individuals and small teams, with links and coordination. We should support research by junior investigators and students.

Milestones. Progress in the field might be evidenced by the development of a study section on supply chain management and production processes, by the creation of coding/classification systems, by the development of educational programs, and perhaps by an increased presence of hospital CEOs who are professionals in industrial system engineering (e.g., as vice president of operations). Other possible milestones would be the occurrence of test beds and case studies, publications of papers on supply chain best practices, measures of improvement in safety, outcomes, and system performance (IT and health care), and measures of reduced infections, transaction costs, and time.

Resources. Needed resources include funding, people with training and options for cross fertilization, data, and policies that encourage transparency. Affiliations could include government agencies that leverage foundation and industry support. Potential players are the American Hospital Association, the Healthcare Information and Management Systems Society, the Medical Device Manufacturers Association, the Medical Group Manufacturer’s Association, the World Health Organization, and the CDC.

Dissemination. Because this is an emerging field, it should encourage publications in first-, second-, and third-tier journals. Research results should be disseminated at conferences, through consortia, and through virtual networks.

The breakout group members recognized an additional key factor. Technological changes (e.g., the use of cell phones) will alter the health care system naturally,

presenting the need for revised strategies for supply chain management and production processes.

Enhancing the End of Life Experience **—Session Summary**

Nhan Tran, (facilitator), Ilaina Edison, R.N., M.B.A., Stephanie Guerlain, Ph.D., Marilyn Rantz, Ph.D., R.N., Shinyi Wu, Ph.D.

Nhan Tran asked the members of the End-of-Life Experience breakout group to consider what might be achieved and what barriers are to be overcome. The group members suggested that end-of-life care does not have a strict definition. Also, end-of-life care differs only slightly from palliative care. End-of-life care refers to a physical fact, in which end of life can be gauged and is imminent. It does not refer to age.

There is a need to establish strategies for decisionmaking for end-of-life care. We need strategies for informing surrogates about desires. A common problem is that desires are not communicated when conditions change. We need a system that supports communication.

Problems that need to be addressed include (1) the fact that a linear path of care often is mandated toward the end of life, ignoring complexities that can occur, and (2) the fact that legal issues inform many actions. Although *physician-ordered life-sustaining treatment* is called for in some states, many specialist physicians are not familiar with it.

Often, near the end of life, patients are transferred from setting to setting, and care coordination suffers. Ilaina Edison called for better integration of end-of-life care into the general health care system. We need processes that allow for linkage and facilitation. One solution might be to define a “billable event.” We might consider an electronic chip that stays with the patient during the steps of end-of-life care. An identification card also could be used, yet there would remain a problem of keeping the card up-to-date. We need linkages among multiple physicians and medications.

The group members agreed that one topic for future research is the value of providing such linked services. How does one measure the value of intervention? Are there alternatives to hospice care? The concept of decision support involves many systems issues. It should be based on the assessment of value. How can we determine what actually happens during the end-of-life processes? The breakout group members considered the idea of creating medical records that can be accessed by the patient’s family. Perhaps a daily report could be made available.

The group emphasized the consideration of patient-centered goals, symptom management, and the use of protocols for handing-off care.