



# DEVELOPING A MODEL FOR TECHNOLOGY ASSESSMENT

In March 1991 the Franciscan Health System (FHS), Philadelphia, established a Technology Assessment Task Force specifically to create a better linkage between technology expenditures, the system's Catholic values, and principles of stewardship. Composed of nurses, physicians, other clinicians, and managers from member hospitals and the corporate office, the task force made a number of recommendations that have helped the system and its members make technology decisions in a more informed and systematic way.

## A DIVERSE SYSTEM

FHS, sponsored by the Sisters of St. Francis of Philadelphia, comprises 12 member and 3 affiliate hospitals, 11 long-term care facilities, and some 14,000 employees. Its facilities span seven states in two separate geographic regions, the mid-Atlantic and the Pacific Northwest.

FHS invests excess revenues into programs that further its mission of care and service. This focus on community benefit permeates FHS's strategic and financial plans, capital needs identification, and resource allocation processes. Healthcare delivery that uses costly technology presents financial challenges and raises stewardship, quality, and efficiency concerns.

As in any large organization, FHS has different organizational strengths, interests, and capabilities with respect to technology assessment. For example, the regional office for the system's western facilities, Franciscan Health Services

*A System  
Helps Its  
Facilities  
Prepare for  
Technological  
Change*

BY FRANK FOX, PhD,  
& ELLEN BARRON

Northwest, has an established research and development capability that serves as the focal point for technology education and analyses for the region. However, because not all FHS entities want or need the same on-site model or approach regarding technology, the task force needed to develop flexible recommendations with broad applicability.

## KEY RECOMMENDATIONS

The task force met eight times over a one-year period. The result was a recommendation for a time-phased approach to changing the way technology is identified, acquired, and used in FHS organizations. Key recommendations to help prepare each FHS organization for technological

**Summary** In 1991 the Franciscan Health System (FHS), Philadelphia, created a Technology Assessment Task Force to support specific goals and strategies in the FHS strategic plan and to help prepare its members for technological change. Because FHS is a large and diverse system, with facilities in seven states both on the East Coast and in the Pacific Northwest, the task force needed to develop flexible recommendations with broad applicability.

The task force recommended a time-phased approach for changing the way technology is identified, acquired, and used in FHS organizations. Key recommendations included (1) creating a standing FHS technology steering committee, (2) implementing a technology assessment model for selected technology activities, (3) sponsoring systemwide technology conferences, and (4) reviewing FHS technology actions, revising as appropriate.

The system and hospital leadership adopted the task force's recommendations and are now implementing them.

*Dr. Fox is vice president, research and development, Franciscan Health Services Northwest, Tacoma, WA; and Ms. Barron is senior vice president, corporate development, Franciscan Health System, Philadelphia.*





change included:

- Creating a standing FHS technology steering committee
- Implementing a technology assessment model for selected activities
- Sponsoring systemwide technology conferences
- Reviewing FHS technology actions, revising as appropriate

### THE WORK PLAN

Task force recommendations were the result of a work plan, developed to help managers throughout FHS make smarter decisions; establish better market position; track emerging technologies and the performance of existing ones; create a better "futures" position for member organizations; build a stronger technology assessment team; share information among system entities; and track system, regional, and hospital technology activities. The work plan included the development of:

- A task force charge (purpose), objectives, and outcomes
- A definition of "technology"
- A set of assessment standards to evaluate technologies
- A master list of new, emerging, and "sunset" technologies
- A technology assessment model

**Charge, Objectives, and Outcomes** At its first meeting the technology task force determined the scope of technology assessment as it pertains to FHS, and it refined a preliminary task force charge, objectives, and outcomes.

The task force developed the following charge, or statement of purpose:

To develop, design, and recommend a simple, timely participative methodology to evaluate existing, new and emerging technologies and their applications in order to maximize their useful life.

This charge provided a stepping stone for discussion of the objectives and outcomes.

The task force identified a lengthy set of objectives, with emphasis on attaining defined, measurable outcomes and providing value to all hospitals in the system through integrated, applied research activities. Objectives included:

- Determine the scope of technology assessment
- Determine what other healthcare organizations are doing with regard to technology assessment
- Develop a master list of new and emerging technologies, practices, and protocols

The Franciscan Health System, Philadelphia, established a Technology Assessment Task Force to create a better linkage between technology expenditures, the system's Catholic values, and principles of stewardship.

- Develop and use a prioritization method
- Determine how FHS hospitals currently are monitoring, assessing, and acquiring technology and which personnel are involved
- Establish standard staff analysis formats and technology evaluation criteria
- Prepare overview papers on top-ranked technologies
- Establish a communication mechanism and network to share findings (about technologies and vendors) among FHS organizations
- Realize group purchasing and cost-savings potential on technology acquisitions
- Integrate technology assessment with quality management practices and protocols

The task force focused on technology-related activities that were relatively short term and already in use, rather than on "frontier," emerging, or early stage technologies, such as robotics, genetic engineering, or PET (positron emission tomography) scanners. Given this orientation, the task force identified the following desired outcomes:

- Integrated technology monitoring and evaluation throughout FHS organizations
- A cost- and time-effective process to assess technology
- Identification of acquisition methods and costs and ongoing operating and maintenance costs
- Technology integrated with hospital facility development
- A generic framework and guidelines to be customized for each facility
- Review of specific major acquisitions as a group to determine completeness
- A multidisciplinary model to be used by hospitals in technology decision making
- Identification of successful (and unsuccessful) technology implementations and reasons for their success (or failure)
- A risk assessment methodology for technology models
- A list of the system and individual facility or provider basic technologies and technology needs
- Staff analyses of new, top-line technologies to eliminate redundancy of effort

**Definition of "Technology"** As the task force members worked to develop a charge, objectives, and outcomes, they became aware that they lacked a standard, working definition of the term "technology." So they could work together using a single, consistent definition, they developed the following operational definition of technology:

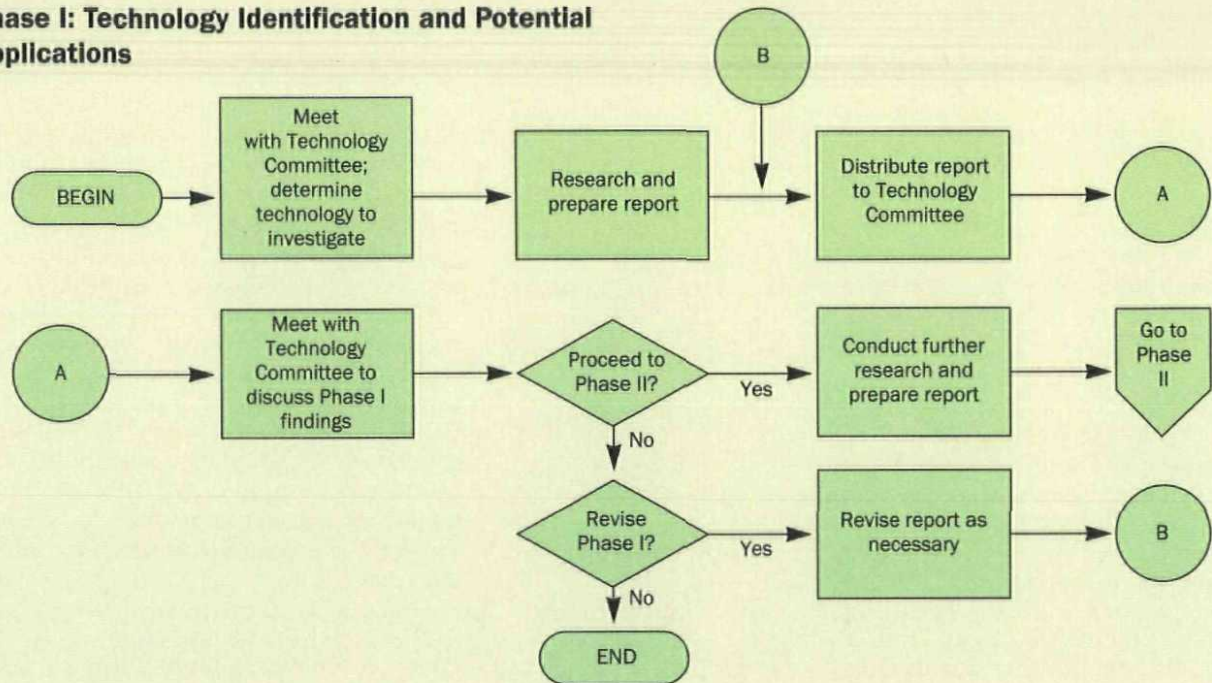
A process, procedure, protocol or capital asset that provides a clinical/diagnostic outcome, and/or clinical and patient care



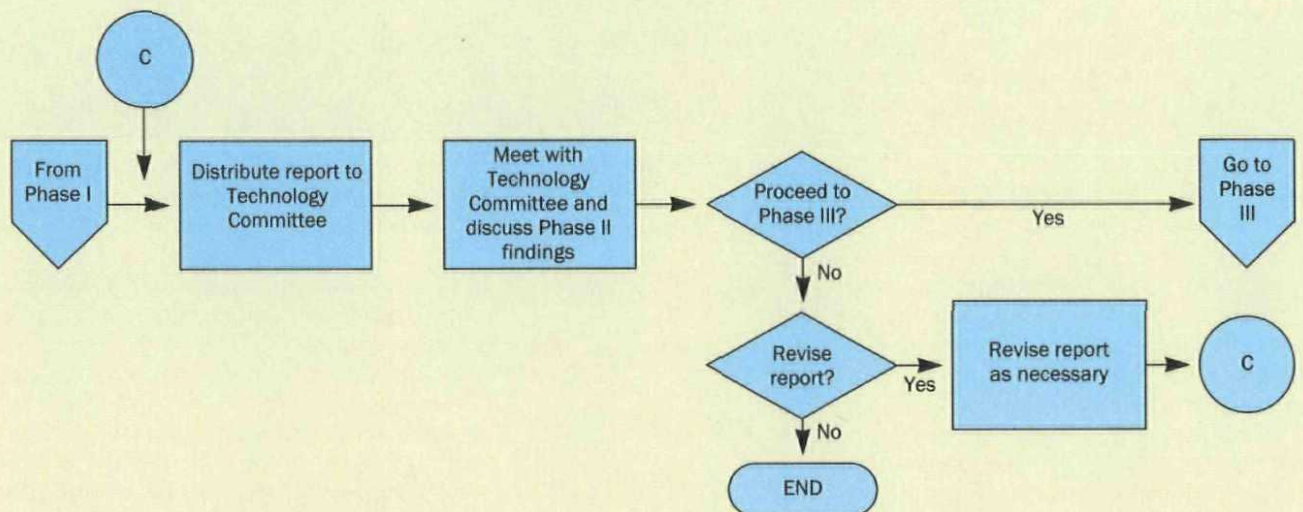


## FHS TECHNOLOGY ASSESSMENT MODEL WORKFLOW (1992)\*

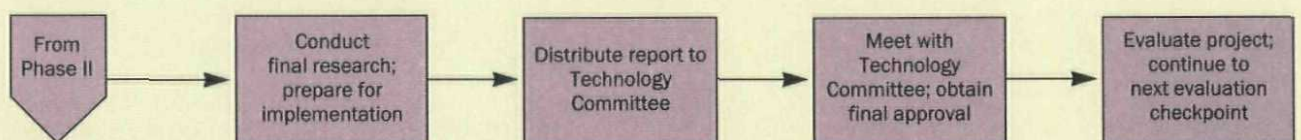
### Phase I: Technology Identification and Potential Applications



### Phase II: Technology Assessment and Recommendations



### Phase III: Technology Implementation



\*These actions are taken by a technology investigator, or "champion." The Technology Committee reviews the analyses and makes recommendations.





information. This includes existing and new diagnostic and therapeutic equipment, pharmaceuticals, and medical/surgical procedures.

**Technology Assessment Standards** The task force then developed high-level screening standards listing criteria to determine whether to pursue a given technology. Not all these screens apply to a given technology; rather, the standards are meant to provide focus and a rationale for the proposed project. They include:

- Mission effectiveness—promotes mission and values; meets community needs; increases potential for collaboration with community healthcare providers
- Improved physician relationships—enhances interaction and cooperation with medical staff and hospital
- Quality improvement—improves quality of direct and/or indirect patient care; promotes outpatient or noninvasive alternatives; decreases risk to patients
- Improved efficiency—promotes synergism with existing services, programs, and clinical strengths; decreases lengths of stay; promotes efficient operation, staffing, and other resource utilization
- Strategic market performance—promotes the organization's strategic plan; enhances market position
- Financial gain—achieves targeted financial performance and other key measures
- Integration of technology with facility management and development—combines decisions on clinical development, physical buildings, and technology as packages
- Identification of training, recruitment, and human resource needs—provides growth opportunities for existing staff and physicians; identifies recruitment needs

**Master List of Technologies** The task force separated technologies into several categories and compiled a master list based on research or the task force members' knowledge. The task force recommended this list be maintained by the system Technology Steering Committee as a dynamic, active file on technologies. It also recommended the list be revised by each hospital, as necessary. Technology categories include information, diagnostic imaging, surgery and other therapies, pharmaceuticals, nonacute/after-care settings, operations and facilities management, nursing, and laboratory/genetics.

**Technology Assessment Model** The task force reviewed several models of technology evaluation and assessment, including those of the American Hospital Association and other healthcare organi-

zations. It recommended one (with some modifications) developed by one of us (Frank Fox) and tested at Franciscan Health Services Northwest. This model has three phases: identification, assessment and recommendations, and implementation (see **Figure**, p. 52).

The first phase defines the idea, product, or service, using selected sources within and outside the organization. It also includes the project rationale and analysis of alternatives. The investigator, or project "champion," compiles information to support high-level cost-benefit analysis and risk assessment of the project alternatives. The investigator completes this phase with an executive summary, which is reviewed and subsequently modified, denied, or approved for further study. The organization's technology committee—generally the chief executive officer and a few senior managers, physicians, and clinical experts—participate in the review and approval process.

The second phase expands on the executive summary. The investigator reviews more literature and makes telephone calls and site visits to organizations familiar with the technology to obtain project planning, implementation, and operations information. Then he or she prepares a draft business plan, which contains situational, demand, alternatives, and financial analyses and recommends an action. The plan contains forecasts and performance assumptions related to the technology. It is reviewed by the technology committee before the study proceeds.

Phase three results in a detailed action plan, complete with implementation steps and a timeline for completing the project. This may include project operations or acquiring and developing a technology. The plan identifies both financial and human resources needed to successfully implement the project. The investigator also prepares monitoring actions to ensure the project meets established targets.

#### MODEL TEST

The task force tested the technology assessment model with a study of laser technology, in which they defined the technology, identified current and future uses, profiled system laser usage, explained alternatives, and made recommendations. Key findings of this study included:

- Among all 12 FHS member hospitals, 52 lasers are in use.
- In fiscal year 1991, member hospitals performed 7,986 laser procedures; most were ophthalmic applications.
- The system uses more CO<sub>2</sub> lasers, followed by argon and argon/krypton lasers.
- Growth in laser usage will likely occur in

*Continued on page 65*

The  
Technology  
Assessment  
Task Force  
developed  
high-level  
screening  
standards  
listing criteria  
to determine  
whether to  
pursue a given  
technology.



## DEVELOPING A MODEL FOR TECHNOLOGY ASSESSMENT

Continued from page 53

The steering committee's long-term goal is to help each FHS organization make well-informed technology decisions that meet community needs, conform with physicians' priorities, and improve the quality of patient care.

biostimulation, photodynamic therapy, laser diagnostics, and tissue welding.

The task force recommended selecting lasers with multiple applications for start-up programs, monitoring lasers with low volumes for possible discontinuation or replacement, and developing target volume and performance standards as key elements of existing and new laser programs.

Franciscan Health Group-East has applied the model to evaluate linear accelerators. Franciscan Health Services Northwest has also used the model numerous times, applying it to magnetic resonance imaging (MRI), computed tomography (CT), laparoendoscopic procedures, and waste management. Each of these technologies is being considered by one or more of the FHS Northwest hospitals. These studies have resulted in three hospitals sharing MRI service and two hospitals undertaking laparoendoscopic procedures. The CT study, on the other hand, helped convince management that an "ultrafast" CT should not be acquired.

Each study has assessed different issues and tested different outcomes; thus the model has changed each time, but the analytic framework, the work flows identified in the Figure, have remained the same.

### IMPLEMENTATION

The Technology Task Force's conclusions and recommendations were presented at the 1992 FHS Futures Forum, an annual meeting for the system's senior leaders that focuses on emerging issues and trends. These recommendations included designation of a technology steering committee with a budget of less than \$50,000 for fiscal year 1993. The funding request included monies for consultative services by technology experts, access to data bases and literature search files, and a system technology conference. System and hospital leaders adopted the recommendations and are now implementing them.

Beginning in July 1992, steering committee members were selected, and they held their first meeting in October. The committee is drafting a vision statement, revising the technology priority list, and selecting technology studies. It is also working to integrate the hospitals' technology purchases and to provide better information about current and future technologies. Its long-term goal is to help each FHS organization make well-informed technology decisions that meet community needs, conform with physicians' priorities, and improve the quality of patient care. □

## PAIN MANAGEMENT

Continued from page 39

20. T. Patrick Hill and David Shirley, *A Good Death*, Addison-Wesley, Reading, MA, 1992, p. 140.
21. *Care of the Dying*, p. 11.
22. Kathleen M. Foley, "The Cancer Pain Patient," *Journal of Pain and Symptom Management*, January 1988, p. S16.
23. Daniel Callahan, *Setting Limits*, Simon & Schuster, New York City, 1987, p. 177.
24. Hill and Shirley, p. 155.
25. Hill and Shirley, p. 155.
26. Hill and Shirley, p. 155.
27. Callahan, p. 178.
28. Vatican Congregation for the Doctrine of the Faith, *Declaration on Euthanasia*, June 26, 1980.
29. *Guidelines on the Termination of Life-Sustaining Treatment and the Care of the Dying: A Report by the Hastings Center*, Briarcliff Manor, NY, 1987, p. 73.
30. Daniel C. Stoltzfus and John M. Stamos, "An Appraisal of the Ethical Issues in High Technology Cancer Pain Relief," *Journal of Clinical Ethics*, Summer 1991, p. 114.
31. Pope Pius XII, address of February 24, 1957, AAS 47 (1957), p. 147.
32. "Clinically significant respiratory depression rarely occurs in patients with severe cancer pain, even those taking large doses of morphine because pain is a powerful antagonist to this effect of opioids. Furthermore, tolerance to the respiratory depressant effects of morphine develops rapidly. I know of no evidence that chronic ventilatory failure is either common or severe in patients with severe cancer pain who have been titrated to receive repeated large doses of morphine." June L. Dahl, private correspondence, and D. E. Joranson, in Kathleen M. Foley, ed., *Advances in Pain Research and Therapy*, vol. 16, Raven Press, New York City, 1990.
33. *Declaration on Euthanasia*.
34. *Guidelines*, p. 71.
35. Pope Pius XII, p. 71.
36. Liebeskind and Melzack, p. 132.
37. Sydney H. Wanzer et al., "The Physician's Responsibility toward Hopelessly Ill Patients," *New England Journal of Medicine*, March 30, 1989, p. 847.
38. *Guidelines*, p. 116.
39. Daniel C. Maguire, *Death by Choice*, Doubleday, Garden City, NY, 1984, p. 197.
40. Elizabeth Latimer, "Auditing the Hospital Care of Dying Patients," *Journal of Palliative Care*, vol. 7, no. 1, 1991, p. 13.
41. For a fuller treatment of the theological perspective, see *Care of the Dying*, particularly Part IV.