

The healthcare delivery system is going through a transition that is led by three major driving forces: cost, technology, and social expectations.

planning and thereby provides a rational basis for assessing how many patients may be expected to use services and what level of capital resources is needed to provide those services [12]. This would define the types and volume of equipment needed to meet demand. Equipment is categorized by its function and owner department requirements in an assets list developed by the user and equipment planner as part of biomedical engineering validation of meeting appropriate clinical standards and institution integration prior to purchase recommendation. The plan must be layered with present organizational capital asset requirements for replacing and upgrading existing inventory to maximize effective use of the existing capital equipment matrix and for appropriate systemization of medical processes. At this point, it is the managers who have to link technical capabilities to clinical requirements. Too often planning is the result of a crisis, a situation that does not permit thorough analysis, and usually it is a time when it is too late to begin a plan. Managers are expected to understand why their institution's values and mission are set as they are, to pursue their institution's strategy and business plan through that knowledge, and to act in a way that effectively allocates resources for which they are responsible. One may not necessarily be a part of the organizational level that develops the institution's strategic plan; however, one must be familiar with it, one must understand and believe in it, to be able to develop an action plan at that level that supports the institution's mission.

To implement an effective plan, one will be expected to know how the present state of technological deployment should be assessed and to have a good rapport with the research-and-development industry to be able to provide a forecast and review of emerging technological innovations, the impact that they may have on the particular institution, plus have the ability to articulate justifications and provisions for adoption of new technology or of the needs to enhance or replace existing ones. Because tomorrow's clinical devices are in the research laboratories today, a medical equipment manager should be considering visits to such sites as well as to the exhibits areas of the major medical scientific meetings. To facilitate the process, the current state of the healthcare organization's inventory should be assessed and quantified by the clinical engineer based upon numerous criteria. This process is aided by the existence of both biomedical engineering equipment and finance capital equipment databases. The technology management process would include an assessment using a multiyear template of when and if equipment will need upgrading, replacement and when new acquisitions are to be added. Clinical engineering should then calculate a lifecycle for each asset. Using cost-accounting analysis that includes a review of the impact equipment has on reimbursement methodologies such as cost-based or case-based, and in conjunction with a

market-based forecasting model, each prospective piece of equipment should be priced and an overall annual cost of maintaining the organizational inventory assessed as well as new additions supporting the strategic plan. Given the limits of an organization's resources, an overall prioritization can then be developed so that the most important medical technology related to the strategic plan are procured, thereby enabling the organization to satisfactorily meet its service obligations, maximize financial returns, and attain goals.

The past decade has shown a trend of increased legislation that supports more Federal regulations in healthcare. These and other pressures will require that deployment of, and justification for, additional or replacement medical technology is well planned. If you subscribe to the saying that you cannot manage what you do not measure, and you cannot measure what you do not define, then the need for the development and the maintenance of a systematic and comprehensive planning process for the adoption of medical technology in hospitals is obvious. A mixture of literature review and experience demonstrates that the rationale for technology adoption is derived from the following reasons:

- clinical necessity
 - meet or exceed medical standards of care
 - effect on care quality or level
 - effect on life quality
 - improve accuracy, specificity, reliability, timing, and/or safety of interventions
 - change in service volume or focus
 - response to community needs
- management support
 - better or more effective decision-making protocol for interventions
 - improve operational and maintenance efficiency and effectiveness
 - effect on development of or current offering of service
 - reduce liability exposure
 - increase compliance with regulations
 - decrease dependence on staffing and/or the skill level of personnel, improve staff retention
 - effect on supporting departments
 - improve return on investment or cash flow
 - enhances integration and knowledge sharing
- market preference
 - improve access to quality care
 - increase customers' convenience and/or satisfaction
 - enhance organization or service image
 - improve financial or value impact
 - reduce cost of adoption and ownership
 - effect on market share
 - improves community conditions.