Kaiser Permanente Southern California Regional Technology Management Process: Evidence-Based Medicine Operationalized

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Introduction

Kaiser Permanente (KP) has a robust process for evaluating, deploying, and monitoring new types of medical technology, including devices, equipment, diagnostics, and procedures. This process provides guidance and management of new and existing medical technology to ensure that physicians of the Southern California Permanente Medical Group (SCPMG) can provide state-of-the art care. The success of the process depends on participation of a variety of internal professional and physician experts as well as other internal groups, such as the Interregional New Technologies Committee, Laboratory Committees, and Pharmacy Committees.

The process of managing medical technology uses three teams of physicians and support staff: the Medical Technology Assessment Team (MTAT), the Medical Technology Deployment Strategy Team (MTDST), and the Regional Product Council (RPC). The medical technology management process seeks to evaluate medical technology in a timely manner, using principles of evidence-based medicine and focusing on efficacy, safety, and expected improvement in health outcomes. The evaluation process also provides analytical and tactical support to SCPMG physicians by assisting them with systematic, well-thought-out deployment of medical technology. The final component of the process considers benchmark standards to coordinate purchase of the technology while ensuring that KP leverages its collective purchasing power, and provides appropriate vendor support.

Over the past two decades, the process of managing new technology in the KP Southern California Region has evolved continuously. Initially, in 1983, a Medical Technology Committee was formed to evaluate requests of local medical centers for regional approval to purchase capital medical equipment. At that time, much focus was directed on new types of imaging technology, such as computed tomography (CT) or magnetic resonance imaging (MRI).

In 1995, the Technology Assessment and Guidelines (TAG) Unit was developed to support the committee by providing evidence-based evaluation of new technology. In 1998, the California legislature enacted the Friedman-Knowles Act, which set the stage for independent medical review of coverage decisions for individual health plan enrollees. The Medical Technology Inquiry Line was created in the KP Southern California Region as a one-stop location for giving clinicians prompt access to objective, evidence-based medical information on new technology. With the support of the Permanente Federation, this service was expanded to include support for KP regions outside California.

In 2000, a process called the Medical Technology Management Process was implemented to connect the discipline of evidence-based evaluation of medical technology with a strategy for planned equipment purchase and deployment. Figure 1 shows the groups currently participating in this process, the components of which include assessing and deploying medical technology as well as responding to inquiries about it.

Technology Assessment

The Medical Technology Assessment Team (MTAT) performs critical analysis of published, peer-reviewed medical literature to evaluate the evidence supporting use (or avoidance) of specific types of technology for medical diagnosis or treatment. Assessment of new tech-


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nology includes describing the specific health problem, the population of concern, the new technology, any alternative interventions, and the desired health outcomes. The medical problem of interest is described precisely and systematically with input from clinicians practicing in specialties relevant to the specified condition.

One of the analytical staff uses PubMed (an online bibliographic resource) to search the medical literature. The published medical literature is searched also to identify any previous assessments that may have been conducted by other organizations that use evidence-based methodology (for example, the Emergency Care Research Institute, Blue Cross/Blue Shield, or Hayes, Inc, an independent assessor of health technology). Information is sought also from government agencies, such as the US Food and Drug Administration (FDA), National Institutes of Health (NIH), National Cancer Institute (NCI), Centers for Disease Control and Prevention (CDC), and from medical specialty societies.

The MTAT carefully evaluates the quality of available evidence by thoughtfully considering such factors as number of studies and subjects, quality of investigation (Figure 2),[1] consistency of study results, certainty and magnitude of possible benefits and harms, and number of potential candidates for a specified intervention. Stating the rationale for its conclusion, the MTAT develops and forwards to interested specialty groups a recommendation based on the sufficiency of the evidence.

Technology Deployment

Technology whose use is supported by available evidence is also recommended by MTAT to the Medical Technology Deployment Strategy Team (MTDST), which considers the logistics of deployment, including forecasting the need and uses for the technology, developing a business case for its use, determining requirements for training and credentialing staff who will use the technology, and defining processes for monitoring the quality of the technology's outcomes. The Regional Product Council (RPC) is responsible for acquiring, standardizing, and budgeting for medical equipment. The RPC communicates with KP's geographic service areas in Southern California.

This process of evaluating, recommending, planning, acquiring, and monitoring use of new medical technology is tied together and is administratively coordinated by the Joint Chairs Committee (a group which includes the Chair and Cochairs of the MTAT, MTDST, and RPC). The Joint Chairs Committee ultimately makes regionwide recommendations about new technology

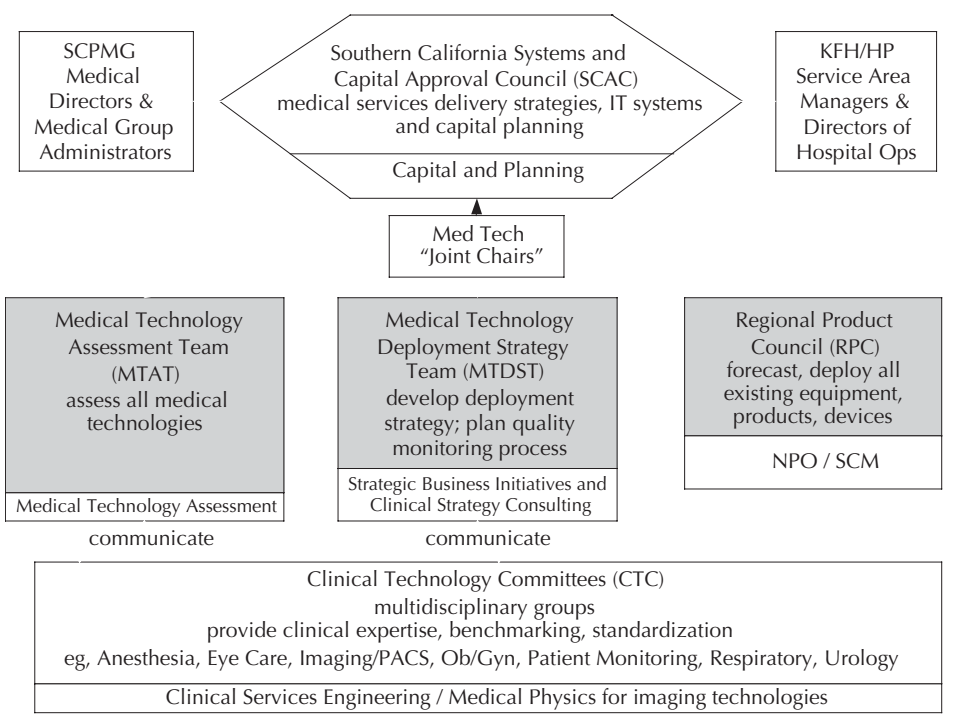

Figure 1. Diagram illustrates the KP Southern California Region technology management process.

Figure 2. Diagram shows pyramidal hierarchy of evidence used by clinicians, researchers, and administrative decisionmakers to evaluate medical technology for possible use in the KP Southern California Region. *(Reproduced by permission of the publisher from: SUNY Downstate Medical Center, Medical Research Library of Brooklyn. SUNY Downstate Medical Center evidence based medicine tutorial [home page on the Internet]. [Brooklyn (NY): SUNY Downstate Medical Center]; 2005 [updated 2004 Jan 6; cited 2005 Nov 14]. Available from: http://library.downstate.edu/EBM2/contents.htm.*[1]

after carefully consulting with KP internal experts, chiefs groups, regional clinical committees, and clinical technology committees. At their meetings, the medical directors and medical group administrators receive regular updates on new technology, including capital requirements as well as implications for future space planning.

Responding to Inquiries about Technology

Physicians or Member Services Representatives with a specific patient case question or leaders with questions about new technologies can easily access informational resources on new technology by contacting the KP Southern California Region Technology Inquiry Line at 626-405-5138 or by sending an electronic inquiry to Med-Technology-AGU, Scal (KP e-mail) or scal.med-technology-agu@kp.org (Internet access). Questions can range widely—from the newest technology for targeted cancer therapy or drugs still in clinical trials to the oldest technologies—and ask, for example, "What is the role of leeches in medical therapy?" and "How can we acquire leeches appropriate for medical use?"

In response to the inquiry, the technology assessment group sends an electronic file containing several components:

- a summary and analysis of published information
- a reference list with published abstracts obtained from MEDLINE
- assessments obtained from other evidence-based organizations, if available; and
- information on FDA/Medicare coverage.

The inquiry line receives about 700 inquiries per year, about a third of which originate from outside California. Maintaining assessments and responses in a database enables most inquiries to be answered within 24 hours.

The KP Interregional New Technologies Committee

Technology that may have programwide application is also assessed by an interregional KP group, the Interregional New Technologies Committee. This group, chaired by the Permanente Federation Associate Executive Director for Quality and Program Improvement, includes physician-representatives from each KP region, Program Offices, the Care Management Institute (CMI), and from Kaiser Foundation Hospitals benefits and regulatory services, legal counsel, public affairs departments, and ethics advisors. The INTC tracks emerging technology as it is developed for entry into the marketplace.

On the basis of the published literature reviewed, the INTC can issue any of three types of recommendation:

- Sufficient evidence shows that use of the technology is medically appropriate for select patients
- Insufficient evidence exists for the committee to determine whether use of the technology is medically appropriate for any patient; or
- Sufficient evidence shows that use of the technology is generally not medically appropriate for any patient.

Recommendations and discussion of the rationale for new technology discussed by the INTC are available on the clinical library Intranet site, http://cl.kp.org/. These materials are filed under Clinical Practice Guidelines as the last item (New Clinical Technologies) and can be searched either chronologically or alphabetically. Table 1 lists some recent examples of technology reviewed by the INTC along with its recommendations.

Evaluation of New Drugs

Assisted by monographs prepared by KP National Drug Information Services, the KP Pharmacy and Therapeutic Committees use an evidence-based approach to assess the safety and efficacy of new medications. Individual clinicians can obtain literature searches and information about new medications from the Drug Info line (available by phone in the KP Southern California Region), electronically at Drug-Info-Inquiry (available through KP e-mail), or Drug-Info-Inquiry@kp.org (accessed over the Internet).

The KP Biotechnology and Emerging Pharmaceuticals Technology Advisory Committee (BEPTAC) was formed in response to the exploding growth of new types of medication, including human proteins, mono-

clonal antibodies, growth factors, immunomodulatory drugs, and chemotherapeutic agents. Although expensive, these drugs often represent major advances in treating the diseases for which the new medications are approved. Monitoring these medications is challenging also because they may have more widespread potential applications that have not yet been well studied; and that neither the safety of these medications, often approved after review of very limited clinical trials, nor the adverse reactions they cause, may not yet be completely understood. This concern is illustrated by the recent withdrawal of natalizumab from the market after progressive multifocal leukoencephalopathy developed in some patients who had received the drug as treatment for multiple sclerosis or Crohn's disease.[2-4]

Table 1. Recent recommendations of the KP Interregional New Technologies Committee regarding several new types of technology

Evidence sufficient to recommend use of these technologies in selected patients
• Vagal nerve stimulation for patients with intractable epilepsy
• Wireless capsule endoscopy for evaluation of Crohn's disease
• Artificial lumbar disc replacement for single-level vertebral disease
• Bone morphogenic proteins for spinal fusion surgery
• Laparoscopic hysterectomy for benign uterine conditions
Evidence insufficient to recommend use of these technologies
• Vagal nerve stimulation for treating depression
• Electrical stimulation and electromagnetic therapy for healing of chronic wounds
• Islet cell transplantation for patients with type I diabetes
• Robot-assisted prostatectomy

Challenges to Use of New Medical Technology

Tension in evidence-based technology management is presented mostly by the statement that "there is insufficient evidence showing that this intervention is medically appropriate for patients." Because the process tries to "stay ahead of the curve," many assessments of medical technology initially include this statement, often reflecting existence of lag time between data collection, its presentation at specialty society meetings, and publication of the evidence in peer-reviewed medical journals. In some cases, the technology that appears in a publication is already outdated and has been replaced by newer methods. Frequently, assessments must be updated and the medical literature monitored until the technology "matures" or until high-quality investigational trials are completed.

A good current example of this sequence of events is presented by virtual colonoscopy as used for detecting polyps and colorectal cancer. The medical community eagerly awaits the results of ongoing large randomized controlled trials to determine the utility of this technology compared with standard visual colonoscopy.[5]

Another reason for concluding that a recommendation is supported by insufficient evidence may be that different studies present conflicting evidence. In addition, other reasons may be found for recommending against use of medical technology: existing published studies may be methodologically weak or include too small a study cohort; the magnitude of the benefit may be small; or no comparison has been made with existing technologies and therefore no evidence has been presented showing that the newer technology improves upon the older technology. In these instances, one possible solution is to deploy the new technology at KP as part of a research protocol or as a quality pilot project designed to collect data for responding to unanswered questions about whether the technology deployed within KP has improved treatment outcomes. If the technology is thus deployed as part of a research protocol, we can contribute to the health of our communities also by contributing to the peer-reviewed medical literature or by publishing our own results. With our organization's size, the interests of our clinicians, the strength of our research departments, and especially the power of an electronic medical record, the future holds much promise for us to lead in the most effective use of new medical technology. ❖

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