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NIH Consensus Conference Concludes That MRI Is "Unusually Rewarding," Calls For More Studies

Magnetic resonance imaging "has proved to be unusually rewarding in the detection, localization and assessment of extent of character of disease in the central nervous, musculoskeletal and cardiovascular systems," a panel concluded at an NIH consensus development conference last week. However, the full potential of MRI has not been reached, and additional prospective studies are needed,
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In Brief

NCAB Schedules Full Day Of AIDS Discussion; PBS To Show Documentary On Tobacco Issues

ENTIRE SECOND day of the Nov. 16-17 meeting of the National Cancer Advisory Board will be devoted to reports on AIDS research programs at NCI and NIH. Robert Gallo, William Blattner, Michael Boyd, Samuel Broder, Peter Fischinger, Anthony Fauci and Maryann Roper will make presentations. Annual program reviews will be made Nov. 16 by the NCI division directors and chairmen of their boards of scientific counselors along with reports on the Frederick Cancer Research Facility, Organ Systems Program, and NCI's efforts to increase patient accrual in clinical trials. . . .

"SHOWDOWN ON Tobacco Road" is a one hour documentary that will be presented on PBS television stations Nov. 11 (stations in some localities will show it later in the month or in December). Merrell Dow Pharmaceuticals funded the program which reportedly looks at all the major issues involved in smoking's impact on health. . . . "FIFTEEN YEARS after its establishment, the Frederick Cancer Research Facility is the internationally recognized center of scientific excellence that was originally envisioned," Assistant Secretary for Health Robert Windom commented as the new contract awards for operation of the center were officially announced last week. . . . MICHAEL ERIKSEN, director of behavioral research at M.D. Anderson Hospital & Tumor Institute, is the new president of the Society for Public Health Education. . . . CORRECTION: The article in The Cancer Letter Sept. 25 on the Women's Health Trial identified Maureen Henderson and Ross Prentice, PIs for the trial's clinical unit in Seattle and statistical center, respectively, as being affiliated with the Univ. of Washington. They are in fact at the Fred Hutchinson Cancer Research Center.

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Panel Concludes MRI Is Effective, Safe, Has Some Limits, Needs Research

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the panel reported following the two and a half day meeting.

Herbert Abrams, professor of radiology at Stanford Univ., was chairman of the panel. Other members were Alfred Berne, director of the Dept. of Medical Imaging, Course Irving Memorial Hospital, Syracuse; Gerald Dodd, head of the Div. of Diagnostic Imaging at M.D. Anderson Hospital; Harold Dodge, professor of medicine, Univ. of Washington; Sid Gilman, chairman of the Dept. of Neurology at the Univ. of Michigan; Samuel Hellman, physician in chief at Memorial Sloan-Kettering Cancer Center; Charles Hufnagel, professor of surgery at the Univ. Services Univ. of the Health Sciences; Stephen Kieffer, chairman of the Dept. of Radiology at the State Univ. of New York Health Science Center, Syracuse; John Kirkpatrick, professor of radiology, Harvard; Don Long, chairman of the Dept. of Neurosurgery at Johns Hopkins Univ.; James McCort, chairman of the Dept. of Radiology at Santa Clara Valley Medical Center, San Jose; Barbara McNeil, professor of radiology and clinical epidemiology at Harvard; Maxwell Mehlman, director of the Law-Medicine Center at Case Western Reserve Univ.; Constance Row, president of Calvert Memorial Hospital, Prince Frederick, MD; and Sanford Schwartz, associate professor of medicine at the Hospital of the Univ. of Pennsylvania.

The panel addressed four major issues:

*Are there contraindications to or risks of MRI?

*What are the technological advantages and limitations (disadvantages) of MRI?

*What are the clinical indications for MRI, and how does it compare to other diagnostic modalities?

*What are the directions for future research in MRI?

Following are summaries of the responses to those questions, as presented in the draft report of the conference:

Contraindications. MRI is generally safe when used in accordance with the performance characteristics approved by FDA. Risks are primarily related to the static and oscillating magnetic fields used in MRI. Caution must be exercised when there are ferromagnetic objects imbedded in the patient, such as aneurysm clips, shrapnel, or implants

such as cardiac pacemakers or pacemaker wires. Caution must be exercised in patients requiring monitoring and life support systems, and in pregnant women. So far, research has not found any risks to the fetus, but MRI during pregnancy should be performed only if it offers a clear advantage over other tests.

Advantages and limitations. Its major technological advantage is that it can characterize and discriminate among tissues using their physical and biochemical properties. Blood flow, cerebrospinal fluid flow, and contraction and relaxation of organs, both physiologic and pathologic, can be evaluated. Because MRI is relatively insensitive to bone, tissues surrounded by bone, such as the contents of the posterior fossa and the spine, can be imaged, and beam hardening artifacts are avoided. MRI produces sections of equivalent resolution in any projection without moving the patient. The ability to obtain three dimensional images adds to its versatility and diagnostic utility and offers special advantages for radiation therapy and surgical treatment planning. Excellent delineation of anatomic structures results from inherent high levels of contrast resolution. Para and superparamagnetic contrast agents, which appear to be relatively nontoxic, will soon be available in the U.S. They will permit evaluation of the integrity of the blood-brain barrier, the reticulo-endothelial system, and the extracellular space.

MRI does not use ionizing radiation, nor does it require iodinated contrast agents. Because it requires little patient preparation, patient acceptability is high.

Disadvantages. The relatively slow scan acquisition time results in artifacts due to biological (physiological) motion of cardiac, vascular and cerebrospinal fluid pulsation, respiratory excursion, and gastrointestinal peristalsis. Technological advances now evolving, such as improved surface coils, respiratory, cardiac and peripheral gating, chemical shift imaging, and fast scanning may resolve many of these problems. Some patients, particularly those acutely ill, cannot cooperate and movement artifacts result. Patient throughput is slow compared with other imaging modalities.

Because of the small bore of the magnet, approximately 10 percent of patients cannot cooperate due to claustrophobia, and some obese patients cannot be imaged.

While the inability to image calcium provides some advantages, it also limits the ability to detect pathological calcification in soft tissues and tumors, and pathological changes in cortical bone are poorly depicted.

MRI equipment is expensive to purchase, maintain and operate and requires extensive shielding. Hardware and software are still being developed.

Clinical indications and how it compares to other diagnostic modalities. The panel took the position that the diagnostic capability of MRI relative to those of its competing modalities was the most important endpoint to be assessed at this time. It should be recognized that an experimental approach that optimizes the attainment of diagnostic information cannot readily provide simultaneous information on the effect of MRI on other indices such as patient management and patient outcomes. It deserves emphasis that the panel focused on efficacy and not on cost considerations.

(The panel's draft report emphasized that most of the MRI clinical studies so far have not been large, carefully designed prospective studies. "Some of the judgments about the role of MRI relative to other imaging modalities are based on less rigorously designed studies than are desirable. For those clinical situations where MRI can potentially replace other procedures, especially invasive ones, judgments should be verified by additional prospective studies.")

Brain tumors. MRI is a superb method of studying brain tumors because of the excellent contrast resolution, easy multiplanar imaging, and absence of artifacts. MRI and CT are roughly equivalent for detection of most brain tumors. MRI is superior at the vertex, in the posterior fossa, near the walls of the middle fossa, and at the base of the skull. CT is superior to MRI for detection of meningioma but requires contrast enhancement.

Supratentorial gliomas and metastases are detected by either MRI or CT. Secondary effects of the tumor, such as herniation, hydrocephalus and volume displacement of adjacent tissues, are displayed well with both CT and MRI, although more anatomic information is available with multiplanar MRI. Tumor boundaries in gliomas and metastases may be obscured by extensive edema. Contrast enhanced CT currently is better than unenhanced MRI for defining the gross margin between tumor and edematous brain. Neither

method is definitive in establishing a tissue diagnosis. Contrast enhanced CT better demonstrates subarachnoid spread from malignant tumors than MRI.

Meningiomas. The characteristic hyperdense appearance of these tumors on unenhanced scans and the hyperostosis of underlying bone allows superior detection by CT. MRI may provide more information than CT about the effect of the tumor on adjacent structures.

Acoustic neuromas. MRI demonstrates smaller tumors better than CT, without the need for intrathecal air or contrast material, but larger tumors are well visualized by both CT and MRI.

Pituitary tumors. Both MRI and contrast enhanced CT are effective in defining pituitary fossa tumors, but MRI may provide more information about the precise extent of the lesions and their effect on adjacent structures.

Head and neck. In the detection, localization and treatment planning of tumors of the head and neck, MRI offers an advantage over CT due to its multiplanar capabilities, tissue characterization potential, and the absence of artifacts due to bone and teeth.

Tumors of the spine. MRI of the spinal canal has the advantage over myelography of direct, noninvasive visualization of the spinal cord rather than merely outlining cord margins. MRI is capable of demonstrating the entire spinal cord and of differentiating solid from cystic intramedullary tumors. Indications for plain film myelography have decreased considerably and may be eliminated in the future with the widespread availability of high quality MRI. Intradural extramedullary tumors are best demonstrated by MRI or myelography.

Staging of bronchogenic carcinoma. MRI is comparable to CT in diagnosing mediastinal adenopathy. The current interpretive criteria for MRI (as based on nodal size) are derived from and are identical to those used for CT. MRI is superior, however, to unenhanced CT in evaluating hilar masses and is equivalent to enhanced CT. To date, not definitive data exist on the relative roles of MRI and CT in the total staging of a patient with a newly diagnosed clinical stage 1 or 2 disease. Because CT can evaluate the mediastinum and the upper abdomen as part of one examination, it is currently the method of choice.

The multiplanar imaging potential of MRI makes it preferred to CT for determining the anatomic relationship between mediastinal

masses and the great vessels.

CT is preferred for detection of pulmonary nodules. In solitary pulmonary nodules, CT is preferred to MRI for assessing benignity. Because of the ability of MRI to visualize flowing blood, it is preferred to unenhanced CT for determining whether hilar or parenchymal masses are solid or vascular.

MRI is equivalent to CT in the detection of patients with metastases to the liver from carcinoma. The use of iodinated contrast agents may be avoided with MRI. Cysts and hemangiomas, two common benign lesions, are relatively well characterized by MRI.

For evaluating lesions of the pancreas and spleen, CT is superior to MRI.

Renal masses. In detecting renal masses, MRI is equivalent to CT. Cysts and angiomyolipomas can be characterized as with CT, and complicated cysts, containing hemorrhage, can be identified. Benign tumors can be visualized but not reliably distinguished from malignant neoplasm.

Malignant tumors are identified and staged as with CT, but the inability of MRI to detect calcifications and define small tumors is a limitation. MRI is useful for demonstrating vascular invasion.

Thus, MRI may be used in selected cases when CT examination is equivocal or when CT contrast material is contraindicated.

Adrenal gland. MRI is equal to high resolution CT in visualizing the normal gland and in detecting lesions such as hyperplasia, adenoma, aldosteronoma, pheochromocytoma, and primary carcinoma, as well as metastasis. Pheochromocytomas have an MRI intensity pattern that seems to be characteristic. Furthermore, the diagnosis can be made without using contrast agents, to which patients sometime react. Other lesions cannot be reliably characterized.

Female pelvis. The uses of MRI in gynecologic disease are in the early stages of investigation, but the ability of the examination to depict anatomy in three orthogonal planes affords a potentially useful method of staging tumors and selecting and planning the treatment to be employed. MRI is not a screening modality and does not permit specific tissue diagnoses.

Carcinoma of the endometrium. MRI shows promise as a means of staging as compared to physical examination or CT. The choice of therapy may depend on tumor volume, site, and depth of myometrial invasion, all of which can frequently be demonstrated by MRI.

Carcinoma of the cervix. The value of MRI in staging cervical carcinoma lies in its ability to demonstrate the tumor directly regardless of location, calculate its volume, and accurately evaluate extension to adjacent organs. Although useful for staging in selected cases, it has no apparent advantage over CT in the detection of lymph node metastases.

Male pelvis: prostate. While MRI does not permit reliable differentiation of prostatic carcinoma from benign conditions of the prostate, MRI represents a promising method for staging the extent of carcinomatous spread outside the capsule of the prostate gland and appears to be equivalent to CT in this regard. Metastases to regional lymph nodes appear to be detected by MRI and CT with equal efficacy.

Bladder. In staging bladder carcinoma, MRI cannot distinguish mucosal lesions from those with superficial muscular invasion, but it is effective in staging tumors that have invaded the deep muscle layers, the perivesical fat, and adjacent organs and lymph nodes. While no large prospective studies comparing MRI with CT are available, preliminary data indicate that tumor staging with MRI is as accurate as with CT.

Scrotum. MRI permits distinction of intratesticular from extratesticular lesions. It appears to have no diagnostic advantage over ultrasound, except when examining the painful scrotum.

Rectum. The staging of rectal neoplasms as well as the differentiation of recurrent tumor from fibrosis in the rectal wall represent problems that require further study.

Soft tissue tumors. MRI is reported to distinguish between benign and malignant tumors with a high degree of accuracy and demonstrates muscle, nerve, and vessel invasion entrapment. A postoperative, baseline MRI study can be helpful when the possibility of recurrence must subsequently be evaluated.

Directions for Future Research

The role of MRI in the management of the patient needs to be defined. What in existing diagnostic algorithms does it replace? To what is it complementary? For example, will the need for CT, ultrasound, and arteriography decrease? How does the information provided affect diagnosis, staging, therapy and patient outcome? This will require well designed and well conducted studies comparing the efficacy of MRI with existing diagnostic techniques?

Positron emission tomography (PET) can spatially image metabolic processes. To what extent is MRI capable of fulfilling a similar function in regard to pH, blood flow, blood volume, and the metabolism of oxygen and glucose? Similarly, PET has been used to study neurotransmitters and their receptors; can MRI be applied for this purpose not only to the central nervous system but also to different membrane receptors in other organs?

Diagnostic imaging is concerned with detection, localization, and tissue characterization. MRI has been shown to be effective for all three but offers special promise for tissue characterization. Future potential for MRI includes nonproton imaging, for example, phosphorus and sodium. The combination of imaging with localized in vivo spectroscopy may yield fundamental information regarding the metabolic status of a particular organ or lesion. For example, the state of oxygenation of the myocardium or tumors may be determined. In vitro spectroscopy offers a method for examining biologic material of various types, for example, tissue fluids, pathologic specimens, and cells in culture.

Although considerable development of equipment for MRI has occurred, there appear to be opportunities for enhancing both hardware and software. Improving the techniques of MRI includes the selection of the appropriate energy of the magnet, the fabrication of efficient surface coils, evaluation of new pulse sequences, and the development of computer software leading to the richer utilization of the available data.

Gadolinium DTPA has promise as a contrast agent for MRI. There should be an active search for and an evaluation of other classes of contrast agents applicable to MRI. Paramagnetic labeled pharmaceuticals and monoclonal antibodies offer new opportunities for acquiring anatomic, physiologic, and pharmacologic information. For example, there are disorders characterized by qualitatively or quantitatively abnormal receptor sites that would lend themselves to study using these agents.

It appears that MRI is a safe modality for imaging. Nevertheless, there must be continuing investigation of its secondary effects such as local heating of tissues. This is necessary as higher field strengths and rapid imaging techniques are more widely utilized. There is a need for long term studies of the potential somatic and genetic

effects of magnetic resonance. These should consider not only the patient but also those individuals exposed occupationally.

The report concludes:

"MRI is an innovative technique that provides images of the body in many different planes and represents an extraordinary addition to our diagnostic armamentarium. The images generated vary according to the tissues examined and reflect their physical and chemical properties. It is noninvasive, appears to be relatively innocuous in clinical application, and involves no exposure to ionizing radiation.

"Even in the short period of its use, it has proved to be unusually rewarding in the detection, localization, and assessment of extent and character of disease in the central nervous, musculoskeletal, and cardiovascular systems. In the brain, for example, it has proven capacity to define some tumors and the plaques of multiple sclerosis afforded by no other technique. It is a competing imaging method in the evaluation of many other organs.

"Although MRI can be used without contrast media, the information it affords can be augmented by contrast agents now being introduced.

"The full potential of MRI has not been reached and continuing refinement of equipment, contrast agents, and software may be anticipated. As higher magnet strengths and rapid imaging sequences are investigated, further study of the long term biologic effects of magnetic fields is required.

"Additional prospective studies comparing MRI with other diagnostic methods are essential in those areas where the method has shown promise but where its precise role has not yet been defined."

The panel also looked at use of MRI for conditions other than neoplastic disease, with the same mix--it is superior to CT in some instances, inferior in others, and equal in still others.

Epstein Shakes Up "Establishment" By Getting Into Congressional Record

Samuel Epstein, professor of occupational and environmental medicine at the Univ. of Illinois Medical Center, once again has shaken up what he calls "the cancer establishment" by demanding that the scoundrels be forced to go along with his view of how to deal with the cancer problem.

In the mid-1970s while Congress was considering renewal of the National Cancer Act, Epstein turned up at a Senate hearing and stated that the National Cancer Program, started only about five years before, was a complete failure because (he said) it had not reduced incidence or improved mortality. He presented a table showing five year survival in the 30 percent range and said that hadn't changed in 25 years.

Close examination of the table showed that it was based on data generated in 1969, two years before the National Cancer Act of 1971, which established the National Cancer Program, had been passed by Congress. Epstein's demand, that Congress direct NCI to drop most of its support of basic and clinical research and use the money instead to help rid the environment of cancer causing chemicals, was ignored.

With renewal of the National Cancer Act again coming up next year, Epstein returned to the scene recently with a statement clearly aimed at impacting that legislation. A position paper entitled, "Are We Losing the War Against Cancer?", in which Epstein repeated his charges that industry, the American Cancer Society and NCI are all on the wrong track, was inserted into the Congressional Record.

Ordinarily, such items that go into the section of the Record known as "Extensions of Remarks" do not get much attention. Congressmen use that section to reprint clips from local newspapers honoring one of their constituents, and similar citations. Although they are written to appear as if they were delivered verbally on the floor of the House or Senate, they actually are written statements given to the Record clerk.

Epstein's latest barrage couldn't have gotten NCI's attention any more if it had been delivered on national television from the steps of the Capitol. That's because it was inserted into the Record by Henry Waxman, the Democrat from California who is chairman of the Health & Environment Subcommittee of the House Committee on Energy & Commerce. Waxman and Edward Kennedy, chairman of the Senate Committee on Labor & Human Resources, will have more to say than anyone else in Congress about renewal of the Cancer Act.

What's more, in the preamble to Epstein's paper, Waxman was quoted as saying that Epstein is "one of our nation's leading cancer researchers," and that his statement "provides answers to who's responsible for

the rising cancer rates and what we need to do about it."

Epstein blames most cancer on industrial chemicals and rails at industry for the pollution it causes, the government for not being more vigorous in forcing industry to do so, and ACS, NCI and the cancer establishment for focusing their efforts in other directions. Here is what he proposed to do about it, proposals seemingly endorsed by Waxman:

--"A potential source of cancer prevention funding is the multimillion dollar budget of the American Cancer Society, raised by voluntary public contributions. An economic boycott of ACS is now well overdue. Funding inappropriately used by the Society should be diverted to public interest organizations and labor, who are more likely to achieve the goal of winning the war against cancer."

--"A critical legislative priority is amendment of the National Cancer Act to give the highest possible priority to cancer prevention, to redress the historical imbalance existing in NCI between cancer prevention and research, diagnosis, treatment and the basic sciences, and also to insulate NCI from direct Presidential influence. In addition to replacing NCI's director, DeVita, who in spite of his contrary protestations has been indifferent if not hostile to cancer prevention efforts and who has played a major role in perpetrating the myth that we are winning the war against cancer, senior NCI staff should be restructured and boosted by a critical mass of professionals competent in environmental and occupational cancer and committed to cancer prevention. The National Cancer Advisory Board should be reconstituted with a balanced mix of independent cancer prevention professionals, representatives of public interest and labor organizations and concerned citizens, should be subject to close Congressional oversight. Such oversight should ensure that the institutional resources are largely directed to cancer prevention, that grants and contracts reflect this priority and that NCI staff play a key role in providing the supporting scientific basis for legislative and regulatory cancer prevention efforts at the national and state levels."

In response to Epstein and other critics who contend that NCI spends too much on treatment research and not enough on prevention, NCI frequently has pointed out the vast efforts it has undertaken in prevention. As much as half, at least, of the

Institute's budget is involved one way or another with prevention, but is not limited to the narrow approach aimed at providing "the scientific basis" needed by regulators, as Epstein demands.

Richard Adamson, director of the Div. of Cancer Etiology whose entire budget of \$288 million is involved with prevention, responded to Epstein at the recent meeting of the DCE Board of Scientific Counselors.

"The NCI research program in etiology and prevention represents a wide ranging and intensive effort to identify carcinogenic hazards of various types, and to generate basic insights into the origins of cancer and the means of prevention," Adamson said. "There is in place a comprehensive and balanced program of epidemiological, experimental, and multidisciplinary research that has enhanced our capacity at the national and international level to settle the remaining questions in environmental carcinogenesis and the development of preventive measures.

"In my opinion," Adamson continued, "Dr. Epstein vastly overstates the case that synthetic chemicals and occupational exposure play a major role in the etiology of cancer, and this claim causes harm to the research efforts ongoing in those areas."

If Epstein's views were, in fact, accepted by Waxman, the Cancer Program would be in trouble. However, The Cancer Letter has learned that the position paper had been inserted into the Record by a member of Waxman's staff, and that the congressman had not read it although he did know about it. Apprised of its contents, Waxman indicated that he did not agree with Epstein's off the wall recommendations. He has been a champion of environmental cleanup and can be expected to continue those efforts while remaining a key National Cancer Program supporter.

It should be noted that Epstein, for all his protestations, has come a long way in the last 10 years, although he may not be aware of it. He acknowledges in his current position paper that the overall cancer cure rate, "as measured by survival for over five years following diagnosis, is currently 50 percent for whites." He continues, "There is no evidence of substantial improvements in treatment over the last few decades."

For someone who based his case 10 years ago on the contention that survival was only 30 percent, agreeing that it is now 50 percent does show progress, even if he doesn't think it is "substantial."

Concepts Approved For New Contract On CD-ROM, Recompetition

The National Cancer Advisory Board Committee for Review of Contracts & Budget of the NCI Director's Office has approved the concept of a contract to obtain compact disc read only memory capability for the International Cancer Information Center. Estimated cost of the two year project is \$150,000.

The committee also gave concept approval to recompetition of its contract with Prospect Associates for support services. Total estimated cost of the new five year contract was \$1.5 million.

The committee also approved of non-competitive renewals of the contract with the International Agency for Research on Cancer for operation of a clearinghouse for ongoing research in cancer epidemiology, at a total estimated cost of \$470,000; and with the Union Internationale Contre le Cancer (UICC) for the international scientist to scientist information exchange program, at a total estimated cost of \$625,000.

The concept statements follow:

Acquisition of CD-ROM technology. The contract is scheduled for award April 1, 1988.

The purpose of this optical storage/distribution technology assessment contract is to investigate a new storage and distribution medium called compact disc read only memory in conjunction with the increasing, widespread use of personal computers as they relate to the fulfillment of the International Cancer Information Center's mission for the dissemination of cancer information.

At the forefront of technology assessment is the question of whether or not the technology will work in the intended application, the dissemination of information. In the case of CD-ROM technology, the key questions to be answered include definition of the basic parameters of this technology; evaluation of CD-ROM performance with respect to current, state of the art online systems; and definition of the cost parameters associated with adoption of this technology.

An assessment of the ICIC information products for dissemination via CD-ROM technology will comprise not only the technical feasibility of putting ICIC products, or their analogs, onto an optical disc, but also the associated mechanisms and costs. These costs will be compared and contrasted to current dissemination mechanisms to provide NCI with information upon which to base a decision as to whether or not this technology will permit lower costs of distribution, reaching a different audience or other rationale for utilizing this technology. The key questions to be answered include categorization of ICIC products in terms of size, growth rate, access mechanism, volatility and frequency of issue; description of current dissemination methodologies for products and the advantages/disadvantages of CD-ROM technology in lieu of these methodologies; and definition of the mechanisms for transferring ICIC information products to CD-ROM.

There are approximately 500,000 physicians in the

U.S. all of whom may have some need at some time for cancer information. There are also thousands of cancer researchers and other health professionals in the U.S. and other countries who also have a need for cancer information. The penetration of cancer information from ICIC is respectable, as evidenced by the many searches made annually of PDQ and CancerLit and over 10,000 subscribers to Cancergrams, Recent Reviews, Journal of NCI, Cancer Treatment Reports and the NCI monograph publications; but it is also apparent that many more professionals with a potential need for this information are not being reached. The key questions to be addressed include characterization of the current and potential information user group; comparison of current vs. new technology distribution systems for the current user group, in terms of cost, efficiency, etc.; and analysis of unique market penetration that may be available through the use of CD-ROM technology.

Technology, product and market assessment tasks for the contractor will include the acquisition, installation and operation of actual CD-ROM hardware, discware and software not only by the contractor but by ICIC personnel, the preparation of detailed technical specifications that will be utilized for the procurement of four CD-ROM systems for this assessment and all other requirements for product and market assessments. These assessment specifications will include a CD-ROM product survey, an analysis of the product survey, test parameters for evaluating products, and a CD-ROM system specification that includes acceptable components and costs. Other specifications will include characterization of all ICIC information products, assess methods, analysis of methods and costs for creating CD-ROM versions of each of the ICIC information products and the preparation of a transfer specification, based on the parameters of the products and costs for transformation. Finally the contractor will provide definitions, analysis and projections that could be brought about by CD-ROM technology, including cost comparisons, and a specification detailing the potential user base for a CD-ROM distribution system.

The technical assessment tasks are expected to take four to six months; the product assessment tasks are expected to take six to eight months; and the market assessment tasks are expected to take six to eight months. Some tasks will be done in parallel, others will require sequential completion. All tasks for the contract are expected to be completed in 18 months. The tasks will require extensive review with NCI personnel to develop the draft and final assessment documents. The services of one senior level computer systems analyst, one midlevel computer systems analyst and one clerk typist will be required to perform the work.

Failure to proceed with acquisition of CD-ROM technology at this time will result in a lost opportunity to further disseminate cancer information to physicians, researchers and other health professionals.

Support services for the office of the director.

The first year of this award will cost an estimated \$266,389, which will increase to an estimated \$323,797 by the fifth year. These represent reductions from the current level of the Prospect Associates contract, which will be more than \$490,000 during the present year of the award, ending next February.

The office of the director has had a support

services contract since the National Cancer Act was passed in 1971. The contract has assisted NCI in rapidly responding to requests for information from a variety of sources. The variations and type of demand for such services would make it difficult to have an NCI staff experienced in areas specified by the contract.

There are four areas involved: task administration, documentation and presentations, conference and meeting management and on site typing support.

The anticipated reduction from the last year of the Prospect Associates contract to the first year of the new award of more than \$200,000 is due to reduced scope of the tasks. The number of special projects that have involved the contractor will be cut back, and the contract will no longer involve review and production of the NCI annual report.

Funding levels associated with contract concepts are preliminary staff estimates for purposes of discussion and planning. Actual funding of any contract is arrived at based on proposals submitted in response to RFPs and detailed negotiations. Endorsement of a project concept will not necessarily result in issuance of a contract. Funding levels of contracts may be altered due to unanticipated budgetary changes. Multiple contract awards might also be made. Organizations interested in submitting proposals to implement approved contract concepts are cautioned to read carefully any resulting RFP and not to assign undue weight to the staff estimates.

NCI CONTRACT AWARDS

Title: SBIR phase 1, feasibility demonstration of an automatic solubility monitoring system
Contractor: Automated Precision Inc., \$49,867

Title: Tracing through motor vehicle bureaus to determine vital status and current address of X-ray technicians
Contractor: Equifax Inc., \$52,867

Title: Development of a pre-1979 national death index
Contractor: Moshman Associates Inc., \$1,275,253

Title: Epidemiologic studies of cancer in China
Contractor: Chinese Academy of Medical Science, \$258,500

Title: Tracing through publicly available directories and lists to determine vital status and current address of persons treated for peptic ulcer
Contractor: Johns Holding Co., \$11,651

Title: Radiation risk assessment in Israeli children irradiated for tinea capitis
Contractor: Chaim Sheba Medical Center, \$119,647

Title: Assessment of the implementation and impact of the Community Clinical Oncology Program--Phase 2
Contractor: Health Services Research Center, Univ. of North Carolina (Chapel Hill), \$3,281,827

Title: Genetic factors in persons at high risk of cancer--genetic markers for linkage analysis
Contractor: UCLA, \$282,436

Title: Tracing through other sources and resources to determine the vital status and current address of patients treated for infertility
Contractor: Tracers, \$42,497

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