



Beth Israel Deaconess
Medical Center

Beth Israel Deaconess Medical Center

Strategic Plan for Research

“Using Research to Transform Medical Care”

April 8, 2003

Executive Summary

**“Using Research to Transform Medical Care”
A Strategic Plan for Research at Beth Israel Deaconess Medical Center**

Recent revolutionary advances in the biosciences – the sequencing of the human genome, breakthrough discoveries in the molecular bases of common diseases, and the recognition of the synergistic benefits to be derived from multi-disciplinary collaborations among clinicians and scientists, together place us at the dawn of a new era in which dramatic improvements in human health can be achieved. The Beth Israel Deaconess Medical Center can, and indeed must, play a leadership role in this new era.

Over the past year, the BIDMC community, including key researchers, clinicians, senior management, and a group of prominent external advisors, has come together to reflect upon and share ideas for a research strategic plan. The resulting plan maps out an exciting future for BIDMC research, featuring a bold vision of BIDMC as being poised for a unique transformation of its research enterprise. This transformation capitalizes on BIDMC’s strengths and potential as an internationally recognized leader in biomedical research. It also takes advantage of a unique opportunity to significantly upgrade and consolidate its research physical plant. While many challenges remain, we recommend that BIDMC take these bold steps and establish a model that, we believe, other Academic Medical Centers will someday follow.

BIDMC provides an ideal environment in which the transforming discoveries of modern biomedical science can be nurtured and exploited to improve clinical care. Our geographic proximity to our sister institutions in the Longwood Medical Area, along with our historical relationships with the numerous companies that make up the Boston biomedical community, provide an abundance of opportunities for synergistic efforts. Many of our existing research programs are already recognized as worldwide leaders in their respective fields, while others are of high quality and could be dramatically improved through restructuring and strategic investments. Our extraordinary faculty has established a culture that is both entrepreneurial and collaborative, and oriented toward translation of new knowledge into novel medical treatments and patient care.

However, BIDMC’s leaders realize that change is required in order to establish a coherent identity, to foster multi-disciplinary, interdepartmental research, and to more effectively align research with overall institutional goals. BIDMC’s research enterprise faces many challenges, including a widely scattered and aging infrastructure, a difficult but improving financial position, the need to enhance accountability and leadership, and the absence of a legacy of philanthropic support for research.

We are confident that the talent and dedication of our immediate community members – our staff, our leaders, and our board – along with the support of the broader community, will allow us to accomplish our goals and objectives to develop a research program that will represent the state of the art for Academic Medical Centers worldwide.

Research Strategic Plan - Key Elements

- **Vision and Identity:** BIDMC will distinguish itself through a commitment to maintain a collaborative culture that capitalizes on the unique relationships that exist among Harvard Medical School and its teaching hospitals. We will be renowned for our “bench-to-bedside” model of research and for our collaboration with industry to transform discoveries to products that improve human health.
- **Interdisciplinary and Inter-departmental Centers:** We will establish processes, procedures, goals, and accountability for the re-organization of a substantial portion of our research program into thematically linked research centers. New centers will be developed from the foundation of our existing strengths and will catalyze the identification and capturing of additional resources.
- **Better linkage to Translational Goals:** We will eliminate the structural and organizational obstacles that have historically impeded our ability to optimize our potential to create bench to bedside programs that leverage the strengths of our research and clinical programs. We will clearly define the alignment between our clinical and research missions.
- **Consolidation of Research Space:** BIDMC will create a model for 21st century collaborative research in a new, consolidated facility that will amplify the potential synergies between the research and clinical enterprises, create an attractive environment for the retention and recruitment of world-class researchers, and allow for the reorganization of substantial components of research along programmatic lines.
- **Governance:** The respective roles of the Chief Academic Officer, V.P. for Research Operations, the clinical chiefs, and internal and external Research advisory groups will be refined and clarified. Key objectives will include the execution of the strategic plan, a plan and process to guide the efficient use of space, the alignment of clinical and research goals, and the upgrading of our administrative and management systems.
- **Business/Financial Model:** We will develop and adhere to a financial plan for performance and accountability, and create a research administrative infrastructure that provides high-quality service to our research community and sponsors. We will design a financial model to project growth and efficiency in support of positive operating margins for research. We will cultivate and strengthen an environment in which administrative training and regulatory compliance are integrated into research operations.
- **Philanthropy:** We will develop a new and invigorated approach to research philanthropy including the active participation by members of the BIDMC boards and research committee. This effort is likely to require a separate campaign for research.

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Section 1 - Mission Statement for the Research Program

To be a world-class research institution where outstanding scientists work to develop new knowledge for the betterment of the health of our local and extended community. The research program strives to be renowned for its bench-to-bedside model of translational research and for its collaboration with industry as a pathway for transferring the fruits of research into products that improve the quality of life. We commit to maintain a collaborative culture and modern, high-quality facilities, and to take full advantage of the unique relationships that exist among the Harvard Medical School and the Harvard teaching hospitals

Our stated mission is bold and aggressive. It is also eminently achievable given the current strengths of the research enterprise at BIDMC. However, consistent with any successful organization, we will not achieve our objectives without constantly revisiting the way we manage our business. This strategic plan has as its foundation a set of fundamental changes in the research enterprise that will best prepare BIDMC to successfully address its research objectives.

The principal changes that will take place in implementing the strategic plan include:

- ***Change in the way we organize and conduct some of our research programs.*** Although individual investigator initiated awards obtained by entrepreneurial principal investigators will continue to be the largest component of our research portfolio, BIDMC will create new priorities and mechanisms to enhance the establishment and maintenance of interdisciplinary and interdepartmental research centers. Nationally, interdisciplinary research centers or programs are consistently viewed as important and necessary components of future growth of biomedical research. Creation of centers where researchers and clinicians can effectively work together across departmental and divisional boundaries will dramatically enhance BIDMC's ability to recruit top scientists, attract new funding sources, and strengthen its reputation as being a leader in bringing scientific knowledge to the bedside.
- ***Change in the space profile in which research is performed.*** BIDMC will consolidate all of its research space into one or two facilities, the most important of which will be in the recently announced Lyme property. Upon completion, this reorganization within new space will be the most visible change in the BIDMC research enterprise. Although stimulated by the need to identify space to replace the future loss of leased space in several existing sites, this space reorganization creates an opportunity to energize the research program by physically unifying it in a new facility equipped to carry out modern biomedical science. It will permit BIDMC to create for the first time a coherent and meaningful new culture of research, and will be essential for our goal of successfully establishing and maintaining first-rate interdisciplinary research centers. The centers, to be organized along therapeutic or enabling technology themes, will capitalize upon the inherent synergies between the hospital and the research enterprise. Geographic proximity of clinicians and researchers with common interests is essential to optimizing the strategic alignment of BIDMC's translational research capability. During the period before the Lyme property is available, we cannot stand still. Thus, changes to space assignments will occur that meet the overall objective to form new centers of research excellence that match our collective vision and bridge our research efforts with the clinical program. These adjustments will be discussed and debated at the Research Advisory Committee and any other groups appropriate to the topic.
- ***Change in the finance and operational management of research.*** Consistent with any large and complex organization, change must be managed. This

strategic plan introduces a series of focused financial and operational objectives that will result in more visible and better management of the research enterprise. Some of the primary objectives will include improved assignment and more effective usage of research space, improvements to the billing and collection processes involving sponsored awards, and increased focus on management of clinical trials. New initiatives will include development and adherence to a financial budget for research, enhancements to the research administrative infrastructure to provide better service levels to the research community and sponsors, and new increased emphasis on training, regulatory compliance and administration of our sponsored programs.

- ***Change in the governance structure of the research enterprise.*** In the past, BIDMC did not empower a senior research leader (such as a Dean for Research) with responsibility for the research enterprise (reporting to the CEO), and this made it more difficult to develop and implement a coherent research strategy. A new governance structure at BIDMC will assign formal responsibility for establishing institutional research leadership and direction with the Chief Academic Officer (CAO). The CAO will also have institutional responsibility for the strategic, operational and financial performance of the research enterprise. The CAO will work closely with the Department Chairs and the Research Advisory Committee to strengthen the ability of these key groups to successfully contribute to and manage the shared research vision.

These changes will not be introduced into a vacuum. Throughout the one-year effort required to complete this Strategic Plan, significant time has been spent with key researchers and clinicians at BIDMC and with leaders of many nationally recognized biomedical research institutions. We have discussed the rationale for change, the principal strategic objectives we intend to accomplish, and the risk and challenges associated with this effort.

The internal and external perspectives reflect a strong belief that BIDMC's research enterprise is uniquely positioned to enhance its national reputation in research through the consolidation a large fraction of its research operations in a single geographic location. Further emphasis on programmatic research and enhanced governance and administration of the research enterprise will play crucial roles in creating an improved environment for the conduct and management of research. Collectively, these initiatives will best position BIDMC to fulfill its mission as a world leader in translational research and to most effectively contribute to the success of the Medical Center.

Section 2 - Challenges to the Research Enterprise That Create the Need for Change

BIDMC has been able to achieve a significant increase in both the quantity and quality of research during the past 5 years without meaningful additions to available research space and without a corresponding enhancement to the research infrastructure. The growth in research has also occurred during a period of fiscal crisis for the Medical Center – a time during which some members of the community began to question the ability of the Medical Center to continue its commitment to maintaining its status as a major research enterprise. Despite the many scientific achievements, BIDMC’s research enterprise faces many significant challenges, including:

1. A widely scattered and aging set of research facilities, the best of which exist through leases, which expire in 3-5 years. Space is one of the key constraints impacting BIDMC’s ability to expand its research enterprise. The quality, dispersed geographic location, and availability of research space are consistently mentioned as constraints on the Medical Center’s ability to a) recruit and retain researchers and b) to develop new programs consistent with the institution’s strategic goals.
2. The need to adequately fund research growth in strategic areas in an environment of financial crisis within the Medical Center. Reductions in Medicare reimbursement and continuing competition among local hospitals will continue to strain the financial stability of the Medical Center. The Medical Center must identify sources for ongoing investment in research in order to maintain its position as a preeminent research hospital. Without adequate funding for recruitment, facilities, program development, and other needs, the degradation of the research enterprise is assured.
3. An absence of philanthropic support for research. In light of the economic pressures facing clinical operations in most academic medical centers, philanthropic support has become increasingly critical to accomplish the research-related strategic goals. Many research organizations have established visible and sustained fund-raising efforts for their biomedical programs. BIDMC has been far less successful at creating a foundation capable of providing support to the research enterprise. In light of the severe financial constraints faced by the Medical Center, a meaningful and sustainable endowment for research is essential to provide the investment required to fulfill the strategic initiatives for research.
4. The need to enhance accountability and management of the research enterprise. BIDMC has taken many steps recently to enhance its ability to manage the research enterprise. In January 2002, BIDMC created the new position of Chief Academic Officer, intending the CAO to have senior level involvement with the Institutional management team. BIDMC also recently hired a Vice President for Research Operations (starting January 1, 2003). These positive actions aside, future financial challenges and intense scientific competition will place a

premium on management of the research enterprise in a manner that has not been accomplished historically at BIDMC. Failure to effectively manage the research enterprise will result in non-strategic deployment of resources and ultimately will lead to mediocrity in many research programs.

5. We must take into account that the NIH budget may not continue to increase at the pace it has during the past decade when it has virtually doubled in the amount it awards for grants. Obviously, any reduction in budget will make the competition even keener but it may also shift leaders at the NIH toward an interest in mechanisms other than the investigator initiated traditional RO1. We at BIDMC would benefit if we were ready to take advantage of this shift, if it occurs, toward larger program project support grant mechanisms.

Section 3 - Strategic Recommendations

The current model for the conduct of research in a hospital setting had its origins in the early part of this century, and this model remained in place during the period of explosive growth in the size, complexity and organization of both biomedical research and clinical medicine during the past several decades. Although many elements of the relationship between research and clinical care will remain in place going forward, it is necessary and advantageous to change several elements of this relationship to better reflect current realities and opportunities in both the clinical and research spheres.

The main factors contributing to this need for change include the following:

- Reduction in the financial margin available from clinical activities that have traditionally contributed to the support for investment in the research enterprise.
- Increase in the importance of multi-disciplinary and cross-departmental research programs that are not easily developed within the Clinical Departmental structure.
- Increase in the size and complexity of the research enterprise that requires a better-managed and strategic leadership of the overall program, including integration of the overall program with the needs of existing clinical departments.
- A perceived need to establish a more coherent and shared vision of our specific identity as a center for biomedical research. This includes, in effect, addressing the fundamental question as to why a top scientist would want to conduct his/her research at BIDMC rather than somewhere else? What is the competitive advantage of the BIDMC research enterprise and how do we best execute our strategies to capitalize on those advantages?

Although many academic medical centers are experiencing these same realities and attempting to react to these national trends in optimizing the organization of biomedical research, it is extremely difficult to initiate change in such complex organizations since so many constituencies are impacted and organizational and cultural changes must be successfully implemented in a coordinated manner. In this regard, realities faced by BIDMC over the past 18 months, while having created severe challenges to the institution and its commitment to research, also present a unique opportunity for change to the institution at this critical juncture. In response to these fiscal and organizational challenges, BIDMC has:

- Brought in new leadership at almost every level and restructured the Board of Directors.
- Initiated a comprehensive strategic review of its research programs and their organization, including a review by a Visiting Committee of prominent leaders in biomedical research.

- Contemplated new ways of viewing the identity of the BIDMC research enterprise, designed to create an environment that would enhance the benefit to the medical center as a whole, create a competitive advantage for the recruitment and retention of the best possible scientific staff, and serve as a magnet for fundraising via peer reviewed mechanisms, industrial allies, and philanthropic sources.
- Entered into a real estate arrangement that creates the opportunity to reconfigure our fragmented research laboratories into a well planned, centrally located and modern facility.

Taken together, these factors have created an exciting opportunity to rethink the identity and organization of our research enterprise in a manner substantially more bold and innovative than would ordinarily be possible.

The strategic initiatives addressed in this plan involve the establishment of disease or enabling technology-based interdisciplinary programs that will provide a more efficient and effective means of achieving highly successful programs that will more easily merge into translational research. To accomplish these goals in the current environment will require parallel changes in the governance and management of research, as well as a decisive effort to coordinate a reorganization of research space in a central, modern site.

These changes will present the opportunity to catalyze an exciting cultural transformation in the BIDMC research community, such that a truly unique research environment can be created within the already unique Harvard Medical area. Whereas other centers have increasingly fractured research space footprints, ours will be centralized, creating enormous scientific and competitive advantages. Whereas other academic medical centers face structural problems in the creation of bench to bedside programs in areas of broad interest, BIDMC's structural obstacles will **be eliminated**. Whereas other centers struggle to articulate the alignment between their clinical and research missions, ours will be clear and well defined. Whereas other centers face difficulties in developing a research strategy, in part due to uncertain research leadership and interdepartmental conflict or lack of coordination, BIDMC will be in a better position to avoid or manage such conflicts.

It is our contention that these cultural changes will not be merely window dressing or hype, but will have the potential to result in the creation of a model that will receive national attention for the successes that it will engender.

The remainder of this section discusses the specific recommendations for maintaining and further enhancing our national prominence as a center for integrated biomedical research at the cutting edge of science and clinical care.

Recommendation 1 – Create a New Approach to Establishing and Maintaining Interdisciplinary Research Programs.

BIDMC has historically been limited in its capacity to develop interdisciplinary and interdepartmental research programs. We should develop an institutional approach to creating such centers through design rather than happenstance in order to fulfill our strategic goals and maximize the synergy of existing resources. Principal tasks to be deployed will include the establishment of criteria and priorities for Program/center development.

These parameters for creating a center will formalize the circumstances under which a center can be developed (in contrast to current practices which are unevenly applied). The criteria should include:

- Operational expectations and governance structure.
- Establishment of an external advisory committee to review the quality of the research performed in the center.
- Scientific and financial goals and resource requirements.
- Expectations for interaction with within the research programs and the clinical enterprise.
- Anticipated interaction with other Longwood entities.

Discussions and nominations of programs for consideration will be proposed to and evaluated by the Research Advisory Committee. Prospects for consideration can emanate from top down (CEO, CAO, Chiefs etc) or from the bottom up (groups of PI's). Priority will be based on the extent, to which the proposal is consistent with the institution's strategic direction and needs, ease of implementation, space and financial resource requirements, among other factors.

After initial selection of programs for further consideration, the following steps will occur:

- The CAO, in consultation with the Research Advisory Committee, will identify provisional leadership.
- Provisional leader(s) will be asked to develop a programmatic and financial business plan.
- An advisory group will be selected, and approved by Research Advisory Committee, with internal and external members. This group will review the proposal during development.
- Specific plans for periodic external scientific review will be put forward.

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- A formal proposal for governance needs for space, and funding requirements will be developed, ideally including plans for potential reorganization of space within new research facilities.
- A set of specific goals and targets for the program over time will be developed – e.g. program project grants, training grants, philanthropy etc.
- Specific goals for translational research outcomes will be developed, and an analysis of how they would benefit the clinical program will be presented.
- The formal plan for the center/program, encompassing the above elements, will be presented to Research Advisory Committee and medical center administration for discussion and approval.

At this time, we are in the earliest phases of establishing assessments of several new research programs, including vascular research, transplantation research, cancer research, and molecular imaging.

It is our goal to have several of these areas externally reviewed by the winter of 2003, with a formal proposal for creation of the centers shortly thereafter.

Recommendation 2. Consolidate research space into a concentrated group of facilities.

The lack of contiguous space of sufficient quality and quantity is the most significant impediment to achieving BIDMC’s strategic research mission. Underlining the need for consolidated research space is the overwhelming desire of the research community to establish an improved environment for scientific collaboration. Such collaboration will be a critical factor given the focus on program-centered initiatives (see recommendation # 1).

Consolidation of space into a single centrally located facility will create immeasurable benefits to the research enterprise. Discussions with external research leaders at many major academic medical centers confirm our belief that BIDMC’s ability to accomplish physical proximity for all research and clinical operations will create an incredibly attractive environment for recruitment of world-renowned researchers. In addition, the acquisition of major new space on site will permit the reorganization of substantial components of research along programmatic lines, and create potential synergies between the research and clinical enterprises.

BIDMC’s research enterprise currently occupies more than 350,000 net assignable square feet of space in the Longwood Medical area, located primarily at 5 sites that vary widely in age, quality, and desirability.

Current Research Net Square Footage is available at the following facilities:

	<u>Net Square Footage</u>
1. Research North	76,829
2. Dana	44,573
Slosberg-Landay	29,947
Research West	17,593
Others (16 buildings)	50,048
Total Owned Facilities	<u>218,990</u>
3. HIM	95,736
4. Research East	27,404
5. 21-27 Burlington	24,725
Total Leased Facilities	<u>147,868</u>
Total available space	<u><u>366,858</u></u>

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This space is classified in the following manner:

	<u>Net Square Footage</u>
Basic Research	274,044
Clinical Research	22,498
Core Facilities	32,584
Administration	37,732
TOTAL	<u>366,858</u>

A significant portion of research space is currently leased with no renewal option:

- The Harvard Institute of Medicine I facility represents 26% (95,000 sqf) of all research space and is leased through September 2008 with no current renewal option. Harvard Medical School has indicated its intention to reclaim this space when the lease ends.
- Research East represents 7% (27,000 sqf) of all research space and is leased through December 2007 with no renewal option.
- 21-27 Burlington represents 7% (24,000 sqf) of all research space and is leased through November 2005 with a 5-year renewal option.

As a result of this space constraint, future space developments currently being considered by BIDMC include:

- 20,000 square feet in Harvard Institute of Medicine II (connected to the first HIM building) is scheduled to be available early 2004.
- Lyme Property – a new commercially developed facility that, subject to municipal approval, could be online by FY 2007 for phase I and by FY 2009 for phase II. BIDMC has agreed to lease a minimum of 150,000 square feet in phase I, and we are discussing the possibility of obtaining as much as 360,000 net sq ft. This location is directly next to BIDMC's East Campus.

The Medical Center has limited options in terms of how to best meet existing and projected space needs, including lease renewal on key properties, committing to more space in the Lyme properties, and/or managing the space needs through the pace of research growth.

In order to address the anticipated needs of FY 2006 and beyond, the Medical Center must determine the amount of space to be committed to in the Lyme property, which ultimately will become the major focal point of basic research at BIDMC.

In order to develop a comprehensive space plan for Research, BIDMC should immediately commission a research real estate plan outlining various space and financial models incorporating the premises outlined above. The space plan will provide a road map for future planning, development, and conception of interdisciplinary and programmatic initiatives.

The strategic decisions required to be made by BIDMC in addressing the options and issues relating to the size of the research enterprise and the pace of growth at which the research enterprise will expand are complex and will have a significant impact on the Medical Center. The real estate plan must address some of the following questions:

- How much total research space will be required, how will it be divided between basic “wet lab” space and space for patient oriented or office based research?
- Should Research North be sold? What are the revenue and balance sheet implications associated with the sale? Should the proceeds of the sale be used to support the research enterprise, including the anticipated transition costs described in this Strategic Plan?
- How much incremental research space, both short and long term, will be required to initiate a partial transformation from the current entirely departmental-based research enterprise to one with significant disease-based programmatic organization?
- The Dana-Slosberg-Landay wing, which is currently part of the core Medical Center space, is out of date and in need of substantial upgrading in order to be considered adequate for research. Should BIDMC upgrade the facility, or should it consider a plan to turn the facility to an alternative use?
- How can we more effectively plan for the needs for clinical/translational research space? This kind of space will be essential for the future programs that we envision, but this space is not necessarily the same as that needed for traditional wet lab investigation. Space may include office space for computer based investigation, space for dedicated patient investigation, as well as space that overlaps with traditional clinical program space. We need a better understanding of the needs for such space, as well as the financial model for use of the space.
- What are the implications associated with over-committing to research space? Should BIDMC be aggressive or conservative in determining the amount of space that will be required to support this Strategic Plan? If BIDMC over-commits to the Lyme facility, is it reasonable to expect that excess space could be leased to other Harvard affiliates?

Recommendation 3 - Modify the Governance of the Research Enterprise.

Previously, the direction and conduct of research at BIDMC has been primarily oriented around and managed by the Clinical Department Chairs and their individual visions. This included the assignment and allocation of space and resources, usually assigned at the time of the Chairs' recruitment. Because the distribution of research among departments varies significantly, the role of the Chair has also varied among departments. In departments of modest size with strong research programs, the Chair may be the active leader of highly successful research programs (i.e. the Neurology Department at BIDMC). Some Chairs of extremely large departments (i.e. Medicine) may assign major responsibility for research to Vice Chairs for Research and multiple strong Division Chiefs. In such cases, the Division Chiefs play a major role in overseeing research issues and recruiting and retaining research faculty, in coordination with and supported by, their Department Chairs and Vice Chair for Research. Individual faculty P.I.s then lead their own programs, which are independently funded by external sources, to variable degrees seeking collaboration with other investigators. Input from non-Chair research leaders, in part through the Research Strategy Committee (RSC) has been embryonic, and limited by lack of committed resources and full empowerment of this group by hospital leadership.

The substantial success that the Medical Center has had over the past 20 years is the result of the organization model described above, which resembles models in place at most other academic medical centers. Although major elements of this approach will be retained in the future research governance structure (including key roles for Department Chairs in research leadership), there are negative consequences of this approach to research governance that will constrain the future success of the research enterprise. The current governance:

- i. Has made it difficult to develop interdisciplinary programs, both within the institution and with outside institutions. Such programs are often the best way to capitalize on modern scientific advances and funding opportunities, and they often require leadership that extends beyond individual departments.
- ii. Has created inefficiencies due to inadequate coordination between departments and divisions.
- iii. Has prevented BIDMC from building upon its strengths to develop programs, including those in smaller departments or units that lack critical mass.
- iv. Has created obstacles to the efficient use of limited financial resources for investment in research.
- v. Has limited the Medical Center's ability to maximize space contiguities that support collaborative research.

The new governance model presented here incorporates significant changes that will enhance the Medical Center's ability to strategically grow and manage the research enterprise. The principal changes to the governance structure are:

1. The Chief Academic Officer (CAO) will have formal responsibility for establishing institutional research leadership and direction in addition to responsibility for the operational and financial performance of the research enterprise. The CAO will work closely with Clinical Department Chiefs (and their research designates where appropriate), to best align the institutional research goals with the needs/goals/resources of the individual Departments. The CAO will also work closely with members of the research community to align their individual interests with the Medical Center as a whole. The CAO will seek advice and support from a newly chartered Research Advisory Committee (ReAC) along with input from the VP for Research Operations and other senior administrative leadership. Critical to the future will be the support, advice and counsel from the Trustees appointed to the Research And Technology Development Subcommittee of the Board of Directors. Although the CAO position was created in January of 2002, the details of how this position was to relate operationally to the overall research program were not well defined at that time. The role defined here will help the CAO in efforts to work with both the research community and BIDMC clinical and administrative leadership in the interest of expanding an effective and quality research enterprise.
2. Clinical Chiefs having a strong commitment to (and in some cases background in research) will be the focus of future Chair recruitment efforts. Success in recruiting such Chairs will be a critical component of our ability to succeed as an academic medical center. We will attempt to recruit Chiefs who have research interests that are aligned with those of the institutional research strategy, and who are personally committed to a collaborative approach to research governance. Chiefs of Clinical Departments will be among the core leaders in the research sphere, to the extent that their backgrounds and interests permit this to be the case.
3. As the Medical Center aggressively seeks to develop funds for investment in new research initiatives that align with its clinical and research strategic visions, some of these funds will be managed under the direction of the CAO, in consultation with the ReAC (including relevant Chiefs). The selection of candidates to lead the initiatives will involve the relevant Clinical Chairs. Other funds (expected to be of substantial magnitude) will be committed to the individual Chairs as part of their recruitment packages, and will be negotiated with both the CEO and the CAO.
4. Proposed research recruitments (those with >80% research activity, as opposed to clinical) will be discussed at a meeting of the ReAC before initiating the search. The relevant initiator of the recruitment (Chair, Division Chief, CAO etc.) should make a case for the position or program in question, and gain support for the goals of the recruitment. This is especially important for recruitments that will be

- funded by institutional funds. To the extent possible, the Medical Center will seek the best candidates through unbiased national searches. Availability of adequate resources in space and funding will be critical determinants of how the recruitment process proceeds. It is recognized that significant numbers of future faculty may move up through the ranks via internal training programs. However, internal advancements will not be the sole or dominant means of rejuvenating the faculty.
5. A Research Space subcommittee will be created as a sub-committee to the ReAC, reporting to the CAO and the VP for Research Operations. This committee will continuously review research space utilization, monitoring both financial considerations (IDC revenues/ft) and strategic considerations. A major role for this group will be to develop a long-term plan for reorganization of space in a substantially consolidated and updated facility over the next 3-4 years. The result of this process will not be a simple transfer of existing groups en bloc to new space. Rather, substantial elements of new space may be assigned to coordinated research centers of strategic interest, such as cancer biology, vascular biology, metabolic diseases, neurobiology, transplantation, inflammations/immunity/infectious diseases etc. Each of the individual PI's in these centers will continue to report academically to their department chairs. However, the management of the space assigned to each center will be the initial responsibility of the designated program area leaders, working collaboratively with the relevant Chairs, and reporting to the ReAC and the CAO. When space above a minimum amount is vacated by departure of faculty, the Research Space Sub-committee and ReAC will discuss future usage of the space before being reassigned.

Although details of the space sub-committee operations are not yet finalized, an important goal will be a decision process whereby the Medical Center will maintain “program independent” space, as opposed to solely department dedicated space. The amount of space assigned to programs, and the programs themselves, will be periodically reviewed, as will the space assigned directly to departments. The sub-committee and ReAC will enable the Medical Center to assign and allocate space in a more strategic manner than has historically been the case. It is recognized that some space may still be allocated to clinical departments regardless of the strategic fit of the research itself, consistent with clinical strategies established by the Medical Center. Even in these cases, deployment within this space will, whenever possible, be discussed with RSC before assignment.

Recommendation 4 – Clarify and Make More Unique the Identity of Biomedical Research at BIDMC.

Academic Medical Centers (AMCs) conduct research in a broad array of areas related to human disease, including a spectrum ranging from specific disease based studies that may involve patients themselves, information about patients, or patient-derived materials (clinical research), to the fundamental biological disciplines that underlie much disease-related research (genetics, cell biology, imaging etc). The lines demarking these two kinds of research are not clear, and increasingly today's research moves rapidly back and forth between the clinical arenas and the fundamental science. Indeed, the two are increasingly interdependent and synergistic. Competitive advantages will inure to those institutions that can best leverage these synergies.

The research carried out at AMCs is diverse as judged by several key parameters: the size of the research effort compared to the clinical program (measured by space or revenues); the balance between clinical/translational efforts and more mechanism based/fundamental science; the breadth of the work across medical and scientific disciplines; and the reputation of the science conducted on a national/international stage. At one end of the spectrum, for some AMCs, research is conducted at a minimal/modest level so as to allow the center to be viewed as a legitimate AMC with appropriate faculty and trainees. At the other end of the spectrum, research is a core element of the program, no less important than the provision of clinical care (and education) in the self-identity of the institution. There are many institutions in the middle between these poles. In most instances, the nature of the research program at an AMC has not resulted from a strategic planning process, but has arisen more opportunistically from diverse local and national conditions, over a period of decades.

How is the research enterprise at BIDMC characterized within this spectrum? By size, research at BIDMC is large compared to national standards, and is competitive with our local comparators within the HMS system (3rd nationally for absolute NIH dollars among independent AMCs, behind only MGH and Brigham, and ahead of Children's Hospital and Dana Farber, and very comparable to the leaders in research activity/revenue as a function of square feet of research space). This fact reflects in part the tremendous power of Harvard/Boston to attract many of the best scientists, and the commitment of our local institutions to biomedical research. Regarding clinical/basic balance of our research, we resemble our Harvard colleagues in having a preponderance of research conducted in "wet labs" and studying cellular mechanisms and animal models for disease, with substantial but less research involving/impacting directly upon the patient. This balance also reflects the kinds of research that NIH chooses to fund today. Research at BIDMC covers a broad range of areas, with some efforts in most of the key areas, although (not surprisingly) the intensity of research varies substantially across areas (as it does everywhere). In this regard we resemble MGH and Brigham, and we are somewhat broader in scope than Children's and Dana Farber.

Our recent *Visiting Committee on Research* took a high level look at our research enterprise in October 2002, and made the points listed above. In addition, they noted that we had a considerable number of research programs that had risen to positions of national/international prominence. These included (but are not limited to) our programs in metabolic diseases/obesity, signal transduction/cancer biology, neuroscience, and AIDS immunology, among others. Some of these programs have leadership positions within HMS as well as nationally. They cited many other strong individual lab and clinical research programs, many of which are also leaders in their fields, but noted that in many cases, research in these areas was less well integrated across relevant themes, had less visible leadership, and therefore had less overall success and national visibility. There were a smaller number of less distinguished research programs, although some of these were linked to clinical or educational programs that were deemed important to maintain.

Importantly, the Visiting Committee also commented that there was not an adequate sense of what, if any, theme/concept/purpose distinguished research at BIDMC from that conducted elsewhere in local AMCs. Unlike disease-based institutes such as Dana Farber (Cancer) and Joslin (Diabetes), AMCs do not typically have a unique research focus or cultural identification. Given BIDMC's widely dispersed research real estate, the fact that many potentially strong research communities within BIDMC are sited at remote locations within different Departments/Divisions, and the fact that no mechanism has been available to better coordinate these labs into potential programs, this lack of focus or cultural identity is also not surprising. On the other hand, there is a strong consensus that research is a powerful core component of the identity of BIDMC as an AMC, and without this component, BIDMC's survival as a major HMS teaching center would be in doubt.

The Visiting Committee had several core recommendations that we are attempting to address in this strategic plan.

- We should attempt to develop a better internal understanding of the nature/goals/culture that we seek for our research program. How might it be distinguished from other sites for biomedical research? Why would a scientist want to build a career here, rather than somewhere else?
- We should focus on new mechanisms to link research activities to our core clinical programs.
- We should develop a governance structure that facilitates departmental research needs/goals being better integrated with a broader institutional vision for research.
- We should develop a new set of procedures to monitor and promote our goal of having the highest quality research that is compatible with our resources and needs.

- We should identify sources of funds to support investment in the research enterprise going forward. Without such sources and investment, the research program cannot help but decline.
- We should develop and maintain an infrastructure for research (research administration and core facilities) that is appropriate to a program of this magnitude and complexity.

Response to the Visiting Committee and Evolution of a Scientific Plan. As discussed in earlier sections, we propose to initiate a rapid evolutionary process whereby, over the next 3-5 years, BIDMC research will be transformed into a newly configured program that has responded substantively and dramatically to the comments of the Visiting Committee, and to the realities that we face today.

What will be the characteristics of this new approach to the research enterprise? This transformation will result in a research community that will be housed, ideally, in one or two modern sites in close proximity to the medical center in the Longwood Medical Area. Research will be led by an invigorated research leadership comprised of the CAO, Department Chairs, Research Advisory Committee, and program leaders in several newly constituted interdepartmental areas. Researchers will be deployed not only in space identified as “belonging” to Clinical Departments and Divisions, but in dedicated space identified for key multidisciplinary Programs, populated with faculty derived from diverse Departments/Divisions juxtaposed according to their research activities. Such programs will have as one key mission the identification and implementation of areas of translational research to complement both basic science and clinical needs. New processes for creation and “sunsetting” of such programs, and access to Medical Center Funds to support them, will be established. An identified plan for philanthropic support for research will be implemented, aimed at investment in new or critical areas as well as providing infrastructure support for research. The broader research program and individual areas of research will undergo regular external scientific and strategic reviews. Recruitment of new Department Chairs with strong research backgrounds/interests will be pursued whenever this fits the broader goals of the medical center, and new Clinical Departmental Chiefs will pursue their identified goals while attempting to integrate their visions into the broader institutional research agenda.

It is anticipated that the physical proximity of research to the clinical sites, the physical integration of the now diverse sites, the aggressive program integration across areas of disease/science including translational efforts, and the invigorated institutional research leadership will combine to create an exciting culture for research, one that will have the possibility to distinguish the BIDMC research culture from that of our sister institutions. **It is our goal to develop a culture for AMC research that will serve as a model for other AMCs in the coming decade.**

How do we initiate scientific change and maintain the vigor of the existing program over the next 1-3 years? As we initiate changes in governance and organizational philosophy, there will be major limitations to our ability to implement immediate change within our research program. The reasons for this include: absence of new available research space for at least 3-4 years; limited funds for immediate investment in research; lack of clarity about the strategic directions of the medical center as a whole. These are major limitations, and our short-term strategy must accommodate these realities, while striving to gain momentum for critical change. Accordingly, we plan to:

1. Make efforts to accommodate and, where possible, strengthen the programs of highest visibility/success at the current time. These programs are not readily replaceable in a period of constrained resources, and they serve as advertisements for our program to the scientific/medical communities and magnets for the best talent in other areas. These core programs include signal transduction/cancer biology, metabolic/obesity, neuroscience, HIV immunology, cardiac development, etc. We will identify the factors that made for the success of these programs, and attempt to apply these lessons to other programs.
2. Aggressively review (internally and externally) our overall programs in vascular biology/cardiovascular, transplantation immunology, and Cancer research. These are areas of core relevance to the clinical program in which we have very strong individual labs, but unclear institutional leadership and widely dispersed laboratory and clinical research efforts. The goal is to develop a staged plan for turning major aspects of these areas into multidisciplinary/interdepartmental research programs over the next several years, with eventual space reorganization within a new space configuration. Preliminary internal plans will be developed by the fall of 2003, external review panels by the winter of 2003, and final plan by the winter or spring of 2003/4. Other areas for program evaluation/review soon to follow in process are Imaging, Genomic and Genetics, Inflammation/infection/immunology.
3. Work to plan and integrate future Chief Recruitment processes as well as ongoing research recruitment activities of recent Chairs as best as possible into this emerging research strategic vision. Examples include searches for new Chiefs of Pathology and Orthopedics.
4. Continue to discuss specific recruitments needed to strengthen key programs in the near term. These represent key scientific opportunities/needs that will have synergistic effects upon several core research/clinical programs. We would like to build institutional consensus for such recruitments, including identifying sources of capital for recruitment packages over the next year. There are of course many areas not listed here that would be mentioned by various

faculty/leaders, and there is no presumption that some of these should not be pursued. The areas below however would have primary call on institutional resources in the short run:

- *Translational research in cancer, most likely expertise in breast, lung, and GI.* This reflects the consensus view that we now have a gap between strengths in the basic area of cancer biology and clinical cancer strengths, with insufficient high quality programs focused on the most important cancers. We do have such a program in the area of prostate cancer, where the full spectrum of work is carried out, from bench to bedside, spawning program projects, roles in the Harvard/Dana Farber Cancer Center, etc. We need the ability to develop such programs in the areas of breast cancer, lung cancer, and/or GI cancer. These represent both major needs and major opportunities. We could recruit outstanding scientists in these areas, but will need an institutional commitment to do so. The impact of this initiative would include benefits to programs in medical oncology, surgical oncology, women's health, imaging, genetics, etc.
- *Genetics/informatics.* It is no surprise to anyone that the science of genetics and genomics technologies is revolutionizing medicine. Researchers at BIDMC employ genetics technologies to a high degree, as these are increasingly essential to the conduct of research. On the other hand, compared to most other leading medical centers, we have probably made less effort than most to recruit new PI's with novel approaches to such unsolved questions, and create infrastructure and programs that will cross the barriers from basic lab to clinical medicine in the area of genetics. In comparison, Partners has made a massive commitment to a new program in Genetics (\$50,000,000 and 40-50,000 new square feet). We need to work with our existing faculty with leading positions in this field (e.g. Christopher Walsh, Neurology, Howard Hughes Medical Institute, genetics of Neurologic diseases) to develop a plan to establish upon the base of current activities (Towia Libermann, Department of Medicine, head of our Genomics Center) a more coherent genetics strategy. This will require one or two recruitments that may relate to other key areas such as Cancer, Pathology, etc.
- *Stem cell/regenerative medicine.* The likely future impact of stem cell biology and the field of regenerative medicine can hardly be overestimated. Fields with likely impact include neurology, diabetes, cancer, cardiovascular and many others. Workers in each of these fields repeatedly identify this as a key area for new recruitment. This is best done through an institutional commitment to recruit an outstanding scientist in this exciting and competitive area. Harvard University has announced its intention to establish a Center for Stem Cell research, and a major site will be in a new research building developed by Mass General Hospital. MGH has named a leader of a Regenerative Medicine Program, and intends to invest heavily in

this area. The existence of this new Harvard wide program will facilitate our own search for a new faculty member in this area.

- *Cellular/organismic aging.* Among the areas in which BIDMC has a clear competitive advantage in both clinical and research arenas is the area of aging/gerontology. In addition to ongoing research in the clinical sphere of gerontology, a major opportunity is in the rapidly advancing science of cellular/organsimic aging. This exciting area does not have a major footprint at HMS currently. A recruitment of a top junior scientist or even a more mature leader would help us to cement and extend our leadership in this area within Boston, and nationally. The research area also integrates extremely well with ongoing research in signaling, metabolism, cancer, etc.

Section 4 – Next Steps

1. **Obtain Board Approval of the Strategic Plan** – The opportunities and implications associated with the implementation of this Strategic Plan are significant. It is imperative that the Board has a thorough understanding of the opportunities, risks, and implications associated with executing this Plan. The primary issues to be addressed and approved by the Board include a) the change in the governance structure, b) the new priorities to be established in developing interdisciplinary research programs, c) the concept of centralized research space management and future plans, d) their personal support needed to initiate a significant philanthropic program for research, and e) the institutional agreement that once these changes are agreed upon that we avoid added levels of internal management reviews that often delay implementation.
2. **Initiate a Real Estate/Space Planning Assessment.** In order to have confidence in the strategic, financial, and operational implications associated with the numerous space consolidation alternatives, the Board should immediately commission a comprehensive real estate/space planning assessment. This initiative should address the lease renewal options on key research facilities, the transitional costs associated with the interdisciplinary programs anticipated by this plan, the revenue and balance sheet implications associated with creation of a centralized research facility model.
3. **Develop a plan for addressing the philanthropic needs of the research mission.** BIDMC must establish a dedicated and invigorated approach to research philanthropy. Historically, there has not been any dedicated fundraising for research. As a result, there is only minimal dedicated endowment support for the research enterprise. Since support funds beyond those of external grants will be required for the foreseeable future, a dedicated and appropriately crafted mechanism for obtaining such support is essential. The approach to fundraising may be substantially different from that appropriate for the clinical/educational enterprise. If funding were available, the research enterprise would have less reliance on clinical funding to support research, and the research community would have more control over resource allocation decisions. By all measures, this proposed research strategic plan would not be successful without significant philanthropic commitment. Many nationally successful academic medical centers have separate philanthropic campaigns focused exclusively on the research enterprise. BIDMC has no such construct. BIDMC should develop a separate research-focus capital campaign, and evaluate the potential advantages of initiating a Research Foundation or similar funding vehicle.

Section 5 – Additional Implementation Issues and Considerations

1. Better understand the financial implications associated with the research enterprise.

One of the most frequently asked questions at major academic medical centers relates to the extent to which research generates operating gains or losses. In essence, does research make or lose money for the institution? Comparable to nearly every academic medical center, research revenues at BIDMC do not cover the fully allocated cost of research. However, prior to institution-wide administrative allocations, research revenue has exceeded the direct and indirect costs of research by approximately \$9 million and \$3 million in FY02 and FY01, respectively).

As the following chart indicates, given certain growth and efficiency expectations, the research enterprise at BIDMC should yield positive operating margins during the next four fiscal years. There are significant swings upward and downward during the 4-year period, largely reflective of additions or reductions in research space. There are many variables that could alter these results, either positively or negatively, including the extent

	FY2002	FY2003	FY2004	FY2005	FY2006
RESEARCH INCOME:					
Direct Income	\$ 108.3	\$ 113.7	\$ 119.6	\$ 125.9	\$ 132.6
Indirect Income	40.0	42.1	44.3	46.6	49.0
Other Income (Royalties, etc.)	2.8	2.8	2.8	2.8	2.8
Interest on Building Sales	-	-	-	-	-
Total Research Income	\$ 151.1	\$ 158.5	\$ 166.7	\$ 175.3	\$ 184.4
Effective Recovery Rate	37%	37%	37%	37%	37%

RESEARCH EXPENSES:					
Direct Expenses	\$110.4	\$115.9	\$124.0	\$129.9	\$136.9
Expenses	108.3	113.7	119.6	125.9	132.6
Cost Sharing	1.1	1.1	1.2	1.3	1.3
Deficit Spending	1.1	1.1	1.2	1.3	1.3
New Faculty Recruitment from Schedule 6)	0.0	0.0	2.0	1.4	1.7
Indirect Expenses	32.3	33.4	36.2	37.0	34.5
Facilities	26.2	26.6	28.4	28.6	25.4
Research Administration	7.0	7.0	8.1	8.6	9.2
Other (Core Facilities, Incentives)	-0.9	-0.2	-0.2	-0.2	-0.1
Total Research Expenses	\$142.7	\$149.3	\$160.2	\$166.9	\$171.4

OPERATING GAIN (LOSS) ON RESEARCH	\$8.3	\$9.2	\$6.5	\$8.4	\$13.0
Allocated General and Administration Costs	19.6	20.5	21.7	22.9	24.1
NET OPERATING GAIN (LOSS) ON RESEARCH	(\$11.3)	(\$11.3)	(\$15.2)	(\$14.5)	(\$11.1)

to which space is utilized efficiently, the effective indirect cost rate, the amount of space available, management cost efficiencies and recruitment efforts, among others.

Institution-wide costs, such as the cost of administrative systems and medical center administration, clearly must be assigned to and recovered by the primary businesses of the medical center. However, the Medical Center's view and goal should not be to achieve a "profit" after institution-wide allocations have been applied to the research enterprise. To do so would be to attempt to accomplish something that no other academic medical center has achieved or tried to achieve, and would likely result in the establishment of a culture that would drive away many of the best researchers that will be critical to realizing the goals of this strategic plan. Since many of the institution-wide costs would remain irrespective of whether research is performed at BIDMC, eliminating the research program would not result in complete reduction of the costs attributable to research on a fully allocated basis.

A successful research enterprise will benefit the clinical enterprise by attracting both patients and outstanding clinician-researchers. Patients will be drawn to BIDMC by the opportunity to receive clinical care by physicians who have immediate access to the latest in translational research. Conversely, investigators will also be attracted to the dynamic environment that supports basic and clinical research in proportions that are virtually unmatched nationally.

2. Establish an-ongoing scientific review process.

BIDMC ranks third, nationally, in NIH funding among independent research hospitals. Whereas the NIH ranking provides prestige on an international level and reflects quality insofar as funding passes NIH peer review, the Medical Center must not let achievements in research volume become equated with better quality.

In order to objectively measure the quality of research at BIDMC, the institution should establish an on-going review process to ensure that the quality of the research programs is consistent with the overall mission and goals set forth in this strategic planning effort. Clear parameters should be established to communicate and define specific expectations of quality to all principal investigators. Such parameters should then form the basis for conducting quality reviews of research programs at least once every three years.

Due to the programmatic nature of BIDMC's research and the extent to which research will be conducted across departmental boundaries, it will be necessary to establish a multi-disciplined peer group to critically evaluate BIDMC's research from a variety of scientific perspectives. Peer reviews should be established for each disease-based program, inclusive of the clinical and research disciplines that are impacted by the research. The input from the review group should be received by the CAO, Research Advisory Committee, and relevant Chiefs and departmental leadership with expectations that actions will be taken in response to the reviews that are offered.

3. Establish an incentive program for investigators and departments.

Most major academic medical centers provide incentives to investigators and department for the generation of external funding. Although BIDMC has historically provided such incentives, these measures were eliminated as the Medical Center experienced serious financial challenges. These incentive programs should be re-established, particularly given the impact that incentives have on retaining and recruiting physician investigators. The structure of the incentive plan and the dissemination of incentive funds will require significant discussion in light of the evolving cross-departmental research focus.

The criteria for establishing the basis for awarding incentives should be closely matched to the institutional, departmental, or center objectives. Incentives can be awarded to chiefs or individual investigators. Among the criteria that should be considered are the extent to which the research is viewed as cross-disciplinary and the financial contribution of the research

4. Clarify the roles and responsibilities within the management of the research enterprise.

BIDMC should establish formal responsibility for the management of the research enterprise. This will involve clarifying the scope of accountability within the research and medical center environments, focusing primarily on accountability for scientific and financial outcomes. At many academic medical centers, including BIDMC, such accountability has been disseminated broadly among senior management and department chiefs, with no one person or position ultimately being held accountable for the performance of the research enterprise. In order for this strategic plan to be effectively executed, BIDMC must clarify the roles and responsibilities among the listed positions.

Clarification of roles and responsibilities involves identifying each function and service performed by impacted positions and operating units within the research environment. Once each function is identified, formal responsibility for performing the function should be assigned. This typically is performed through the development of a matrix that documents roles and responsibilities for each functional unit and for each function. When assigning responsibilities, it is important to be cognizant of operating units that may receive new or responsibility without corresponding resources to carry out the responsibility.

The primary positions for which the roles and responsibility should be clarified include:

- Chief Academic Officer
- Research Strategy Committee & Space sub-committee
- Clinical department chairs
- Chief Financial Officer
- Chief Operating Officer
- Vice President for Research Operations
- Individual units within research administration

5. Increase the focus on financial and operational management of the research enterprise.

In light of the scientific achievements made by the BIDMC researchers and clinicians, it is easy to create a research strategy that builds upon these many accomplishments. Due to the financial constraints currently faced by BIDMC, successful execution of this strategy will require significantly improved fiscal management of the research enterprise.

Management of the research enterprise will require:

- Development of and adhering to a financial plan for performance,
- Creation of a research administration infrastructure capable of providing adequate service levels to the research community and sponsors,
- Establishment of an environment where administrative training and regulatory compliance are integrated into research operations.

To a large extent, these three attributes have been lacking at BIDMC in recent years. It will be necessary to place a high priority on these administrative functions if the research program at BIDMC is going to achieve its strategic goals. The Chief Academic Officer, VP for Research Operations, and the Chief Financial Officer should collectively address the following issues, resulting in a more structured approach to managing research:

- Institutional Review Board business processes
- Management of clinical trials
- Curtailment of budget overruns on sponsored awards
- Billing and collection on sponsored programs
- Assignment and usage of space
- Construction or rehabilitation of research facilities
- Effort reporting and cost sharing
- Increased strategic evaluation of sponsored programs that offer indirect cost recovery at lower than the federal negotiated indirect cost rate
- Compliance awareness and training
- Calculation of core facility billing rates

Along with the renewed commitment to research at BIDMC comes an expectation that the research enterprise will be more accountable than it has been in the past.

Performance measures should be created at all levels of the research enterprise. Such performance measures would enable the research enterprise to be managed much more effectively and enhance the levels of accountability that are so critical to the success of the research program.

Examples of performance measures that have been used by other academic medical centers include:

- Direct revenue per research square foot
- Indirect revenue per research square foot
- Facilities cost per total square foot
- Effective indirect cost rate

6. Continue to support the development of intellectual property for commercial gain.

The commercialization of intellectual property can provide an important revenue source for research institutions, while fulfilling our obligation to ensure that medical breakthroughs achieved by our scientists benefit the public. BIDMC is well positioned to take advantage of the commercialization of its research given the strength of many of its biomedical research endeavors and the commitment already made to the Technology Ventures Office.

7. Determine which strategic alignments should be made with other entities.

BIDMC's research strategy is to continue to take advantage of the resources available through its affiliations with Caregroup and the Harvard Medical School and to promote collaboration with other Caregroup and Harvard affiliates and with institutions in the Boston area. It is recognized that the quality of the research programs must be consistent with the high academic standards associated with BIDMC's status as an affiliate of the Harvard Medical School.

The importance of establishing strategic alignments with other local entities will be critical. Partnerships and affiliations continue to evolve, and it will be essential that BIDMC become more strategic and aggressive in pursuing such alignments from a scientific and financial perspective. BIDMC is not alone in the need to be collaborative, and given the unprecedented amount of research that is performed in the Longwood area, a formal evaluation of the alternatives for collaborating with Longwood or Boston-based institutions should be made.

8. Assess the Medical Center's relationship with industry.

The relationship with industry provides enormous opportunities and challenges for academic medical centers. During the past decade, the role of industry support has been crucial to the success of biomedical research. There is no question that industry research can and should continue to be an important part of BIDMC's research portfolio. While industry support can be more profitable and easy to administer, support levels for biomedical research are also subject to the vagaries of the success of the pharmaceutical industry. BIDMC should aim to achieve industry support of a strategically determined portion of its total research portfolio. The relationship with industry must be closely managed, particularly as it relates to protection of intellectual property, preservation of academic freedom, and resolution of ethical and conflict of interest issues.

9. Integrate the Research Strategic Plan with the Clinical Strategic Plan.

The CEO has recently indicated that a Medical Center-wide strategic plan will be developed during 2003. The strategic direction, focus, and use of resources recommended in this Research Strategic plan must ultimately integrate with the Medical Center's clinical strategies. At this time, the clinical strategies are evolving, particularly in light of the current financial challenges. The successful integration of the research and clinical strategies will be a critical element in the long-term success of the Medical Center.

Appendix A - Current State of the Research Enterprise

Among academic medical centers, Beth Israel Deaconess Medical Center (“BIDMC” or “Medical Center”) is a national leader in research funding, ranking third in the category of National Institutes of Health (“NIH”) funding among independent hospitals in 2001 (trailing only Massachusetts General and Brigham and Women’s, both also Harvard Medical School affiliates).

BIDMC’s research programs are completing an extraordinarily successful 5-year period in which exceptional achievements have been made both in terms of research funding and programmatic quality. During the past five years, the research enterprise at BIDMC has grown by nearly 50%, as measured by direct and indirect research funding. A total of 286 faculty members are Principal Investigators (PIs) at BIDMC with contract or grant funding. In fiscal year 2002, BIDMC had a total direct and indirect funding of approximately \$150 million. NIH and other federal government sources accounted for 74% of the total funding in FY2002.

Description	Direct	Indirect	Total Revenue
NIH and other Federal Government Sources	\$ 70.5	\$ 34.6	\$ 105.1
NIH Training	6.0	0.4	6.4
Foundations and Corporations	15.2	2.2	17.4
Clinical Trials	2.7	0.7	3.4
Harvard Research	5.0	1.3	6.3
Affiliated Federal Research Support	2.2	0.0	2.2
BIDMC Endowment Income/Gifts, Internal Support and Other	8.9	0.2	9.1
FY02 Total	\$ 110.5	\$ 39.5	\$ 150.0