

EDITORIAL

Understanding Cancer Centers

Joseph V. Simone

Huntsman Cancer Institute, University of Utah School of Medicine, Simone Consulting, Dunwoody, GA

CANCER CENTERS are important engines for scientific discovery and for promoting excellence in cancer care. Members of academic cancer centers develop most major advances in cancer research and care, and the academic cancer centers are often central to the vitality of academic medical centers as a whole. Community cancer centers can have a broad positive influence on the standards of care practiced in a community. However, the term "cancer center" is used in the United States to represent a bewildering array of organizations. This report provides a description of cancer centers and some maxims regarding their structure, function, scope, and quality. This is intended to illuminate the structures and forces that influence an individual's ability to navigate and succeed in a cancer center as a trainee, staff member, or patient. This report is an extension of an earlier article that addressed basic issues common to all academic medical institutions.¹ A cancer center is a formal organization of diverse and complementary specialists who work on the cancer problem together and simultaneously rather than serially. The center is under sufficient central authority to focus efforts and organize resources for the efficient and synergistic accomplishment of its goals in patient care and/or research. The center enables and catalyzes a high level of cancer-focused achievement that would not happen without such a formal organization of staff and programs. Leadership in forging progress in the understanding and management of cancer distinguishes a cancer center. The term "cancer center" is neither codified nor protected by copyright. This is obvious, but very important. Any institution or group can call itself a cancer center or comprehensive cancer center, regardless of its qualifications, so the terms themselves have little meaning. One can often tell if a center really is one by who or what it benefits. Any practice, laboratory group, or cancer center aims to benefit its members and patients, but "centerness" depends on the degree to which the group's beneficiaries are the institution's or region's larger cancer mission, the collective understanding of the origins and nature of cancer and how it might be controlled, and society as a whole, both cancer patients and the general population. Thus, while provider and patient can be beneficiaries of any practice, laboratory group, or cancer center, the wider the positive impact of the organization, the more it is a "center" of cancer activity and influence. Cancer centers have no monopoly on providing excellent care. Well over 90% of cancer care is provided in community settings, where patients may receive the best available care. As discussed later in this article, receiving care in a cancer center or an affiliated institution does not guarantee excellent care. There are many well-trained community oncologists who provide high-quality, humane care, keep up on the latest advances, offer patients options including clinical trials, seek consultation from other experts, plan treatment with all relevant specialists, and do not overprescribe medications or other interventions. Community providers also may be more conveniently located or have nicer facilities. However, none of these advantages describes a cancer center, which should provide a broader spectrum of services to the patient to warrant that designation.

ACADEMIC CANCER CENTERS

Academic cancer centers have substantial programs in basic and clinical cancer research, education, and training. Most also have clinical cancer programs, the exception being research institutes that have no clinical function, for example, the Salk Institute in La Jolla, CA, which does only laboratory research, and the American Health Foundation in New York City, which does laboratory and population-based studies.

Excellent academic cancer centers share a number of general features; excellent nonclinical centers share all but those involving clinical programs.

- A clear vision and set of goals, plainly and prominently stated.
- An integrated research program that includes complementary basic and clinical research disciplines demonstrated by joint projects, grants, and publications.
- Multidisciplinary clinical programs that work together prospectively and are actively engaged in clinical research.
- A clinical group that includes medical oncologists, radiation oncologists, surgeons, pathologists, and radiologists formally joined in a prospectively coordinated program of care.
- The routine use of evidence-based standards of care.
- An effective process for interprofessional criticism.
- Collegial transparency of its practices.
- Formal and well-attended cancer conferences.
- Activities in the entire spectrum of cancer, from prevention to end-of-life care, that include underserved populations.
- A formal process for continuously understanding, managing, and controlling cancer better.

All but the second item are the same for community centers; the expectations concerning the environment of cancer care are basically the same for academic and community cancer centers.

Cancer Center Designation by the National Cancer Institute

An academic cancer center may or may not be an officially designated center of the National Cancer Institute (NCI). The NCI currently supports eight nonclinical cancer centers, which are simply designated "cancer center" at the NCI Web site,² 40 "comprehensive cancer centers," which must have qualified research programs in basic, clinical, and population sciences, and 13 "clinical cancer centers" that have qualified programs in basic and clinical research. To qualify for NCI designation and receive a cancer center support grant (CCSG), the cancer center must pass a peer review process to verify that it has a prescribed minimum of peer-reviewed research support, a tangible institutional commitment, a director with authority and resources, evidence that the center functions as a center with multidisciplinary programs, and a number of other qualities. A CCSG does not support research directly; it supports infrastructure that is shared by its grant-supported cancer researchers, such as a microarray laboratory, biostatistics, a tissue bank, the development of new investigators and research initiatives, and the administration of the center. Details regarding NCI-designated centers, including guidelines for qualification and renewal and a current list of approved centers, may be found on the Internet.²

Not all academic cancer centers are really centers. On occasion, an academic cancer center may qualify on paper and even have NCI designation, but members of its programs do not actually work together and meet only when necessary for the competitive grant renewal. In these instances, the programs and center are Potemkin villages with no substance as a center. In fact, the cancer center may be organized only to serve as an intramural or

extramural competitive tool or a means of increasing its market share of cancer patients, rather than as a mechanism of drawing together people and resources to attack the cancer problem synergistically. If such a center does receive NCI designation, it may be because of clever grantsmanship or simply because it or its university has great research strength and prestige and reviewers wrongly assume that the cancer center also must be strong. In these cases, one will find little evidence that productivity in research and multidisciplinary care have materially improved because of the NCI designation and support. Thus, the academic cancer environment at such a cancer center may offer the trainee or staff member little or no advantage compared with an academic institution that has no cancer center. Measures of "centerness" include the frequency and attendance at multidisciplinary conferences and a record of interdisciplinary publications and grants.

NCI designation is not synonymous with high quality cancer care for every cancer. The NCI designation and the CCSG grant are awarded for support of research activities; the NCI review process is not designed to assess the quality of care. The grant proposals of most cancer centers include research on only a narrow spectrum of cancers, and even those cancers that are included are reviewed for the quality of the research, not clinical care. For example, a program that qualifies, is reviewed, and receives a high score for its research in, say, breast cancer may provide mediocre care to the patient. Conversely, a center may have an excellent multidisciplinary program for the care of patients with breast cancer and offer high-quality clinical trials, but the breast program may have insufficient research funding to qualify as a program in the CCSG (a minimum of three independent, grant-funded investigators). That program will not appear in the grant and it will not be reviewed. One might expect high-quality cancer care at prestigious cancer centers, university-based cancer centers, and centers ranked at or near the top in public rankings, such as the eagerly awaited annual issue of *U.S. News and World Report*. That is often the case, but it may be true for only some cancers and maybe only one or two.

Cancer research is closely monitored and measured; cancer care is not. Academic and community cancer centers should, but do not, systematically determine and compare with peers the quality of their cancer care. The Institute of Medicine's National Cancer Policy Board has issued several recent reports on the quality of cancer care in this country, finding that it often fell short of what we would want for our families or ourselves. The reports call for a national system for tracking the quality of cancer care, giving providers data to promote better care, and holding providers accountable for the quality of care.³⁻⁵ Another report from the Institute of Medicine indicts the medical system as a whole for the shocking lapses in the quality of care in the United States, calling for a new health system.⁶ It is ironic that our national cancer enterprise judges and monitors cancer research with an elaborate peer-review system that promotes and rewards excellence, but there is no system that promotes excellence in the quality of care and sees to it that the fruits of that research are applied in an efficient, appropriate, and humane manner. Cancer centers should lead such an effort by example. The cancer centers in the National Comprehensive Cancer Network have a project that moves in that direction.⁷

The activities included in a cancer center and in its CCSG are not necessarily identical. It is important to distinguish between these two spheres because confusion can lead to costly mistakes and wasted time. The grant application usually includes programs and shared resources that qualify by the guidelines; the goal of the center is to include what is needed for the grant to receive a sufficiently high score to be funded. As noted above, some very good clinical programs may not be included because of insufficient research funding, and basic research programs may be omitted because they are insufficiently focused on cancer. Including either may drag down the priority score of the CCSG application as a whole. A cancer center should not allow the criteria for NCI designation to be the sole arbiter of excellence or inclusion in the center as a whole. There also may be excellent individuals in an institution who nonetheless should not be included in the grant proposal

because they work best alone, they are political liabilities, or they are working on an offbeat, chancy research problem.

Types of Academic Cancer Centers

Academic cancer centers with clinical programs come in two varieties, freestanding and matrix. Each has a unique set of strengths and weaknesses and a distinct character and personality. These qualities emanate from the influence of many forces, including the basic organizational structure and the historical evolution of its programs. The social chemistry of these features determines the operational style, work environment, and, in many cases, the capacity to excel. The most basic difference in cancer centers is the institutions in which they reside.

Freestanding cancer centers are entities unto themselves and not part of a larger organization. They are independent not-for-profit entities with trustees and a chief executive who is usually the head of both the center and of the institution as a whole. The center's administration controls all space, appointments, and budgets. These institutions may have university affiliations, but they remain administratively and financially distinct. Examples of such centers include the Memorial Sloan-Kettering Cancer Center, Fox Chase Cancer Center, St Jude Children's Research Hospital, Dana-Farber Cancer Center, Fred Hutchinson Cancer Research Center, the City of Hope Comprehensive Cancer Center, and Roswell Park Cancer Institute. A special case is the M.D. Anderson Cancer Center. It is officially known as the University of Texas M.D. Anderson Cancer Center and reports to the chancellor of the University of Texas system. However, in every practical respect, the institution functions as a freestanding cancer center. Some basic science centers also are freestanding.

The freestanding structure provides a number of advantages, including the power of appointment of members (equivalent to faculty in a university), the freedom to focus all resources on cancer, control of all the revenue it generates, freedom to develop a robust fundraising capability, and a relatively simple administrative hierarchy. Two potential disadvantages of the freestanding center are the inability to attract and support the broad array of medical specialists needed to manage the many noncancer problems patients face and the inability to sponsor graduate students directly. Both of these issues have been addressed to variable degrees. The larger institutions have enough patients to warrant full-time subspecialists in areas such as cardiology and pulmonology; others make arrangements for coverage with local institutions. The Fred Hutchinson Cancer Research Center and the City of Hope Comprehensive Cancer Center have the authority to award advanced research degrees and thus have their own graduate students. Other centers have affiliations with universities that allow students to train at the center under a center member who also holds a faculty appointment at the university.

While not generally true today, some freestanding centers have had persistent or recurring difficulty building and sustaining basic research programs that compete at the highest level. Most freestanding cancer centers began primarily as clinical centers, often spearheaded by surgery departments. Basic research in these centers developed more slowly and later. Cancer centers within the better universities had a major advantage in attracting the best and brightest young people who percolate up through their educational systems in abundance. These students and trainees tend to stay in familiar university systems. Many freestanding centers have overcome this problem by having close ties with excellent medical schools and/or by offering scientists and clinicians better resources, attractive environments for scientific growth, participation in determining institutional direction, and less bureaucracy to deal with.

Matrix cancer centers reside within and are an official part of a university. The term "matrix" is used because the center is intertwined with and dependent on the university structure. Most matrix centers have clinical programs, but a basic science cancer center may also have a matrix structure, eg, the Massachusetts Institute of Technology. The director commonly reports to the dean of a medical school or vice-president for health

sciences. A theoretical advantage of this structure includes the ready access to disciplines not normally found in a freestanding center, such as computer centers or schools of nursing, pharmacy, and social work. A practical advantage is access to medical subspecialists found in a multispecialty university hospital. And as noted above, the advantage of institutional access to large numbers of students and trainees can bolster programs and help attract faculty members.

The main handicaps of matrix centers usually stem from insufficient authority and control of resources. The matrix cancer center does not have the same authority to appoint faculty as a department chairman, with rare exceptions like of the Moffitt Cancer Center at the University of South Florida and the Johns Hopkins Cancer Center. This means the director must negotiate with a department chairman to bring in new faculty. If the director is lucky enough to control substantial space and dollars to support the new hire, and the dean and department chairs are supportive, the process works well. However, a chairman always faces conflicting priorities, and on occasion, a chairman is overtly hostile to the cancer center's growing in size and influence. This hostility may simply be due to a power struggle, or it may arise from a fundamental difference of opinion concerning the nature of faculty membership in the medical school. For example, a chairman may have trained and worked in a subspecialty faculty model that focuses on laboratory research with little patient care responsibility. This model usually involves little real-time dependence on other clinical specialists and personal responsibility for few critically ill and dying patients. The model necessary for high-quality cancer care that includes clinical trials research is quite different.

Matrix centers tend to struggle to develop and sustain clinical programs that are well coordinated, academic, and multidisciplinary. There are many reasons for this difficulty in matrix centers. First, directors are dependent on the kindness of strangers. They must go hat in hand to department chairmen, deans, and hospital administrators for financial support because all revenue traditionally flows to those offices. Depending on the largess of those leaders, the center may negotiate arrangements in which the center shares in clinical revenues or in indirect cost revenues from grants obtained by cancer center members. However, both sources of revenue have many claimants, and the current climate of declining clinical reimbursement is likely to get worse in the years ahead. Thus, seeking philanthropic support has become a major effort of cancer centers.

However, some universities restrict the fundraising activities of cancer centers out of fear that the center may capture big donors and possibly divert them away from another university need. Second, organizing multidisciplinary cancer programs from medical school faculty can be problematic, since the director may not find an academic cancer focus or experienced, collaborative faculty in critical fields such as pathology, medical oncology, and diagnostic imaging or surgical subspecialties such as surgical oncology and urology. The director has little power to fix that problem without benevolent and supportive chairmen. Third, although having laboratory-based clinicians in the cancer center is critically important, if this model is the only currency of excellence in departments, it may be difficult to recruit and retain medical oncologists and others who provide most of the patient care and carry out most of the clinical trials. The current relative paucity in oncology of academic clinicians with both the skills and desire to lead and develop an innovative clinical trials program compounds the problem.

Constructing and sustaining a clinical program is complicated further by the fact that medical oncologists today cannot support their salaries solely from managing patients because reimbursement for the patient encounter is so low. This is true in community practice as well and is often addressed in both settings by using surplus earnings from chemotherapy, laboratory, or philanthropic revenues to make up the difference. Salary support from grants usually is too little to make a difference and to a large degree not practically accessible to many clinical oncologist in the trenches. The university hospital may subsidize the salaries of clinicians directly or indirectly, but this depends on its own

financial health and the attitude of the hospital leadership. It has begun to dawn on the cancer research community that translating the newer approaches in biologic therapy, for which animal models may not work, requires patients, detailed patient data, and skillful academic clinicians to collaborate in the testing. This comes at a time when it has become increasingly difficult to attract and retain well-trained clinical trialists to academic cancer centers.

The major threat to the success of the academic cancer center is provincialism. History indicates that a cancer center may have all the necessary features of quality, including grant support and NCI designation, and still deteriorate into mediocrity. Provincialism is the unwillingness or inability to recruit investigators or clinicians from outside and the habitual reliance on dependable but undistinguished insiders. Often this trend starts when faculty recruits are chosen only to "fill a slot," "cover the service" or "help out in the lab." This is the "safest" and easiest approach, but it often fails to spark the creativity and novelty needed in any research enterprise. Even a large and venerable cancer center can allow itself to slide into provincial stagnation in the laboratory, the clinic, or both.

The Cancer Center Director

A cancer center directorship can be one of the more rewarding jobs in academic medicine. However, it is a complex and difficult job and some cautions are in order.

Becoming a cancer center director will compromise one's personal academic activities. The director candidate must be willing to accept this premise, except perhaps in nonclinical centers. The director can continue to pursue his or her personal academic interests but will need to rely increasingly on others to take on more and more of his or her work. Many lose ground in their research, or at least face a more limited productivity. Some are able to maintain the same scientific or clinical edge, but most will not. At first, the latter will seem to be keeping up, but eventually they may be forced to settle for the work to be at a lower volume or competitive level. The directorship of a modern academic cancer center is a difficult, stressful, consuming job with limited sources of satisfaction. In fact, the director must sacrifice his or her own academic pursuits to make it possible for others to succeed. It is a full-time job, and most successful directors give 75% to 100% of their time to the center, often including nights and weekends, and an additional 25% or more of their time to their own research or clinical activity. Some directors skimp on time for the center, and it eventually shows. If a director candidate suffers considerable dismay that his or her personal research or academic goals will deteriorate badly and that important opportunities may be lost forever, he or she should not take the job. If that feeling becomes strong in a sitting director, a timely exit is in order.

A medical school's excellence is no guarantee of its commitment to cancer center excellence. This seems obvious, but the candidate may be wooed by the solid reputation of the school, its research and clinical facilities, or even by its idyllic geographic location. There are at least a dozen examples that support this maxim, both past and present. A strong medical school is certainly an asset, but it is insufficient alone for developing as complex an enterprise as a cancer center.

A weak or tentative institutional commitment to the prosperity of a cancer center is the single most common reason for a talented director to fail or, even worse, to become mired in perpetual mediocrity. It is not unusual for the recruitment package to be vague, nonbinding, or even silent on critical issues. Of course, even a commitment in good faith and in writing does not guarantee delivery. Occasionally, the university leadership simply cannot deliver what was promised because of a financial crisis or urgent demands elsewhere. So the director candidate is forced to make a judgment on the academic and financial health of the institution as a whole, whether it is a university, medical school, or freestanding center. More often, however, the problem is that the commitment to the cancer center is simply not serious or well defined.

The director candidate's bargaining position begins to deteriorate before the ink is dry on the acceptance letter. As a condition for accepting the position, a cancer center director should have reasonable control of money in the bank, a reliable revenue stream, laboratory and administrative space for growth, and, in a matrix center, a commitment from the dean and appropriate department chairmen to provide and support new faculty positions. As noted above, unforeseen crises may cause promises to go up in smoke. So the more the resources are established and in place, the more likely the first few years will be productive. Relying on a very complex series of events to deliver key resources a year or more in the future is very risky, to say the least.

If the sitting director of a cancer center does not control sufficient space and reliable sources of revenue to grow and develop the center, he or she should consider other career options. Particularly in a matrix center, the only leverage most directors have is money and space. Other issues are important, but these are critical if the center is to have any chance of success. Some directors achieve this by having substantial control of clinical revenues or indirect research revenues, others by having robust philanthropic support. Some are fortunate to have all three. Even with such resources, the job remains very challenging because the director may need to deal with departmental barons who see the cancer center only as a threat, or with his or her own clinical and laboratory prima donnas whose only interest in the cancer center is extracting its resources. The director faces an often convoluted and short-term university hierarchy that tends to move at glacial speed; trying to get answers and decisions can frustrate the most persistent and patient director.

Academic cancer centers at their best are remarkable engines of discovery and high-quality medical care and often play a central role in the vitality of academic medical centers. Each in the string of centers across the country differs substantially from one another in focus, size, and style. Each has adapted to its history and local circumstances, and each serves its own academic and geographic community. Together they are a national treasure from which come most of the advances in cancer research. Although they are complex, fragile organizations that are difficult to manage and keep healthy academically and financially, the efforts of its leaders and members and the investment of the American people in them have been handsomely rewarded over the years.

COMMUNITY CANCER CENTERS

Many community oncologists who are not in cancer centers provide excellent care. From a cancer center, one should expect leadership in much broader services organized in an efficient environment, evidence of continuous, well-documented improvement, and robust participation in high-quality clinical trials. Community cancer centers may be organized in a hospital system or multispecialty oncology practice group. If committed to the necessary organization and to sustaining the highest standards of care, they may have a positive influence on the quality of care beyond the center itself, reaching throughout the larger institution and geographic region.

Just as with academic centers, simply calling oneself a cancer center has little meaning. It often simply means that a hospital has designated a section of an outpatient clinic for seeing cancer patients and giving chemotherapy, or that an oncology practice group owns a building in which chemotherapy and radiation therapy is given. The sign over the door may say "cancer center," but the services may be indistinguishable from that given by any group of oncologists. What should a community cancer center do? Basic features of high-quality community cancer centers are the same as they are for academic cancer centers, without the basic science. Properly organized and maintained, community cancer centers have a unique opportunity to promote excellence in care. Organizing and sustaining such a center presents major challenges, such as overcoming the fierce independence (bordering on isolationism) of some physicians, the all-consuming preoccupation with economic issues in some hospitals or practices, and conflicts over diverting revenues to support unreimbursed activities. Groups considering the formation of a community cancer

center should note the guidelines for pediatric cancer centers developed by the American Academy of Pediatrics.²

PEDIATRIC CANCER CENTERS

Organizationally, pediatricians do it better. Treatment of children with cancer has been far more successful than treatment for adults, mainly because childhood cancers are inherently more sensitive to therapy. However, the organization of care and the majority participation in clinical trials are influential factors in this success.⁸ It has been demonstrated that children with cancer fare much better when treated in pediatric cancer centers.^{9,10} Pediatric cancer centers are widely distributed in the United States. Only St Jude Children's Research Hospital is freestanding and NCI-designated. Others with robust research programs reside either in freestanding or university-based academic cancer centers, like Memorial Sloan-Kettering Cancer Center and Dana-Farber Cancer Center, or in children's hospitals, like Los Angeles Children's Hospital and Children's Hospital of Philadelphia. Virtually all are members or affiliates of the Children's Oncology Group.

The key features of pediatric cancer centers are basically the same as described above for academic and community cancer centers, with some differences due to special pediatric needs and the smaller volume of cancer patients. The features are described in detail in the standards developed by the American Academy of Pediatrics,⁷ including nursing and other services. Briefly, the standards call for all children and adolescents to receive initial treatment in a "recognized" pediatric cancer center that does clinical trials and that a board-certified or -eligible pediatric oncologist coordinate the entire course of care for the patient. In addition, the report states that multidisciplinary care should be provided by experts in pediatric subspecialties, nursing care, and support services, such as social work and psychology. The standards provide an excellent model for any cancer center to consider.

REFERENCES

1. Simone JV: Understanding academic medical centers: Simone's maxims. Clin Cancer Res 5: 2281-2285, 1999 [[Free Full Text](#)]
2. National Cancer Institute, Cancer Centers Program.
[Http://www3.cancer.gov/cancercenters/](http://www3.cancer.gov/cancercenters/)
3. Hewitt M, Simone JV (eds): Ensuring Quality Cancer Care. Washington, DC, National Academy Press, 1999
4. Hewitt M, Simone JV (eds): Enhancing Data Systems to Improve the Quality of Cancer Care. Washington, DC, National Academy Press, 2000
5. Hewitt M, Petitti D (eds): Interpreting the Volume-Outcome Relationship in the Context of Cancer Care. Washington, DC, National Academy Press, 2001
6. Committee on Quality Healthcare in America, Institute of Medicine: Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, DC, National Academy Press, 2001

7. Sanders J, Glader B, Cairo M, et al: Guidelines for the pediatric cancer center and role of such centers in diagnosis and treatment. Pediatrics 99: 139-141, 1997[[Abstract/Free Full Text](#)]
8. Simone JV, Lyons J: Superior cancer survival in children compared to adults: A superior system of care? Background paper for the 1999 report of the National Cancer Policy Board of the Institute of Medicine, "Ensuring Quality Cancer Care." [Http://www.iom.edu/ncpb](http://www.iom.edu/ncpb)
9. Meadows AT, Kramer S, Hopson R, et al: Survival in childhood acute lymphoblastic leukemia: Effect of protocol and place of treatment. Cancer Invest 1: 49-55, 1983[[Medline](#)]
10. Kramer S, Meadows AT, Pastore G, et al: Influence of place of treatment on diagnosis, treatment and survival in three pediatric solid tumors. J Clin Oncol 2: 917-923, 1984[[Abstract](#)]

This article has been cited by other articles:

	<p>JOURNAL OF CLINICAL ONCOLOGY</p> <p>R. W. Frelick</p> <p>Partnering Between Cancer Centers: The American College of Surgeons, American Society of Clinical Oncology, Society of Community Cancer Centers, and Association of Community Cancer Centers Are</p> <p>J. Clin. Oncol., May 1, 2003; 21(9): 1895 - 1895.</p> <p>[Full Text] [PDF]</p>
--	--

