Assessing the Progress of an Integrated, Multidisciplinary Cancer Care Unit

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INTRODUCTION

Conventional approaches to cancer treatment in hospitals and even Cancer Institutes tend to be structured around specialized areas of expertise. The modern era of technological advance and ever greater specialization has of course produced many positive outcomes. Nonetheless, individual patients with multiple needs outside one specific area of specialization are faced with the challenge of navigating a complex institutional environment at a time of great personal anxiety. Basic laboratories, research units, clinical wards, medical and oncologic specialities, image departments and surgical areas, among others, tend to be divided into their own autonomous departments. In such a departmental structure, professionals are typically tasked with performing a specific function in isolation from others involved in the overall treatment program of an individual patient. Despite the benefits of specialization, this approach does tend to lack incentives for delivering optimal personalized care for each patient.

The integration of these disparate departmental functions has been attempted, with varying degrees of success, by means of establishing various guidelines, committees, and protocols. Nonetheless, missed opportunities for improved service delivery abound and serious barriers to the provision of a comprehensively integrated program remain in many conventional cancer care models.

Modern cancer treatment requires the collaboration of different specialists and is thus necessarily multidisciplinary. A more personally tailored approach to treatment concerning the nature, sequence, and quality of the procedures would likely be desirable in many particular situations. But customized approaches which take full advantage of genetic, pharmacological and technological advances are difficult to achieve in clinical settings because all the experts are not present at the office or at the patient's bedside in the prevailing model, which typically involves excessive preparatory procedures and late-stage difficulty in determining the correct treatment options and procedures.

These types of limitations in the prevailing model result in unmet patient needs. The need for greater teamwork has become increasingly evident to fill gaps in care and treatment delivery. Indeed, the traditional medical care model has been placing more emphasis on providing comprehensively integrated, quality service (3). A more flexible, horizontal organizational structure, would likely help facilitate the integration of varying fields of expertise, and provide the patient with greater opportunities for streamlined care from the point of entry forward.

It is of course always difficult to introduce new models of care which break, in certain respects, with the established practices of the traditional hospital healthcare model. Nonetheless the importance of structure cannot be overemphasized, since it determines how well a health care provider functions, according to modern management principles.

The new cancer care unit known as "the Platform of Oncology", located at USP-Hospital San Jaime (www.uspsanjaime.com) in eastern Spain, was developed to address these needs. It was established to deliver high quality patient care, and to promote excellence in the areas of patient information, scientific medicine, clinical research and medical ethics.

It holds 200 beds, 7 operating rooms, an ICU, general Laboratories, Diagnostic Radiology capabilities, a Rehabilitation Department, as well as out-patient consultation services for medical and surgical specialities.

METHODS

The Platform of Oncology was created to provide patients with an improved organizational structure for the delivery of integrative care by an interdisciplinary team. All the specialists of the Platform of Oncology share unrestricted access to the patient and participate in all vital health care decisions. This model enables the patient to make an thoroughly informed, detailed evaluation of the alternative therapies which may be available before making a decision. It was postulated that the new model could also foster the coordination of therapies in areas where multidisciplinary approaches are needed, such as locally advanced disease, limited loco-regional recurrences, consolidation or rescue procedures in case of either minimal residual disease or oligometastasic spread of the disease.

The formation of the multidisciplinary cancer care unit was decided after carefully researching models of teamwork. We reviewed detailed arguments for improving the medical care model available in the scientific literature (4-19). We relied heavily upon one of the best available descriptions of teamwork geared towards caring for near death patients in health care settings, written by Cicely Saunders (1). Based on this seminal work published twenty years ago by Oxford University Press, a leading member of the Platform of Oncology, and one of this study's authors, developed a series of teamwork principles applicable to organized cancer care settings (2).

After extensive consultation and deliberation, we concluded that our team-based approach would require including elements of both a modified medical care model and a single teamwork provider model. In order to provide customized care focused on each individual patient, we deemed it necessary to develop a truly interdisciplinary environment in which every step in the treatment process ─ from initially defining the most useful staging strategy and designing the first optimal therapeutic program to all necessary follow-up (which may include different approaches at different stages as needed) ─ is related to the others. Each of these steps revolves around one overriding interest: providing the best medical interventions according to the individual patients' specific needs. After establishing the overall, decisive approach, the next step was to identify and select qualified professionals interested in developing the model. The team then proceeded to evaluate alternative paths forward, selecting what was deemed the most suitable.

All specialists and cancer-related health professionals were formed into teams to provide their services without any physical or departmental barriers. In this way, patients can be seen in a single medical consultation process, by all the specialists involved in developing their optimal treatment plan. These teams continue to collaborate by implementing treatment plans together, thereby greatly diminishing administrative burdens and increasing the prospect of more seamless service delivery.

This approach applies to both outpatients and inpatients. All oncologic specialists, regardless of their particular field (medical oncology, radiotherapy, surgery, radiology, pathology, etc.) report directly to the Director of the multidisciplinary Unit, rather than a specific department head.

Teamwork has been further facilitated by creating a singular compensation program, whereby everyone benefits from the success of the venture, regardless of his or her actual contribution to a particular case. In addition to fixed staff salaries based upon each professional's own individual combination of qualifications, a portion of all user fees is set aside to a specific fund which delivers variable income every three months. Distribution of this income follows a predetermined scale reflecting overall contributions to the Platform, not the number of particular acts individually performed. This arrangement reduces the propensity for making biased referrals to specialized treatments, thus preventing some possible conflicts of interest.

Teams meet periodically in scientific clinical sessions to update their knowledge, review results, and anticipate future needs. Regular meetings have been incorporated into the unit's operational framework. Some of meetings, including weekly clinical case discussions and scientific sessions, along with the Annual Breast Cancer Update Meeting held together with the European Institute of Oncology of Milan, are open to the public. Other staff, board, and scientific committee meetings are restricted to members. The performance of each professional team member is evaluated on a yearly basis by a Credentials Committee. Annual Reports containing detailed results have also enabled us to evaluate progress in an ongoing manner. An External Evaluation Committee composed of prestigious specialists was created to assess the procedures, activities and results of the Platform according to quality criteria.

Activities in our model are divided into general domains, or virtual flexible units in which every type of professional service is delivered. Each domain is responsible for overseeing its own program. Currently, there are five domains (Care domain, Patient and Family domain, Drug domain, Data, Tumors and Samples domain and Research domain) and a Foundation (TEDECA Foundation) that focus on the research projects of the Platform of Oncology. For a detailed description see the appendix online.

RESULTS

All the specialists involved in determining a diagnosis and developing a treatment program are routinely able to attend the patient in the same offices. A new patient can have a complete work-up examination, including imaging diagnostic procedures, pathological and laboratory studies and other techniques (molecular genetics, pharmacologic, laboratory markers) carried out in a less than 48 hours. Patients are presented interdisciplinary treatment options, cost estimates, and administrative correspondence within the same day. This integrated approach has been constantly reviewed in order to improve performance and time scheduling. Inpatients can be attended by all the relevant faculty staff belonging to the different specialities without any special request. Customized therapy tailored to the disease progression (this might be a better word than extension, but I am not sure) extension and pathological and molecular tumor characteristics was applied with ease.

The Platform cares for 600 new patients annually. About 20% of the patients are foreigners speaking different European languages, and translation to Spanish is available at a 24 x 7 time schedule.

Capacity to care for perhaps up to twice as many is possible within the current facilities, but we anticipate that the prospects for a much larger number of patients will remain rather limited. On the other hand, a higher caseload may be optimum for developing new techniques involving costly equipment. Making use of referrals from other institutions is therefore considered necessary.

Psychological care is available for the patient and next of kin from the first contact on. It is remarkable that psycho-oncology assistance is demanded as often by the patients as by their relatives.

Routine pharmacokinetic-guided chemotherapy resulted in approximately 15% of the patients experiencing an overdose, whereas 30% of them had lower than expected levels of the drug in their system, according to dose calculations derived from body surface area nomograms (20-22). Targeted therapy with tyrosine kinase inhibitors (TKIs) has led to similar results. These data indicate that therapeutic drug monitoring may benefit one out of every two oncology patients.

The Platform has developed its capacity to provide high quality interdisciplinary services gradually, as might be expected, once opportunities to achieve quality increased. A fast-track calendar was also built in to the Platform's operating schedule, so as to diminish barriers to smooth implementation and to bolster project credibility. Despite increases in capacity over time, the full clinical program was nevertheless implemented from the very first day. Patients were treated at USP-Hospital San Jaime to the extent possible, with outside procedures performed at other hospitals through referral arrangements coordinated by administrative personnel.

At present, there Platform utilizes 25 full-time faculty staff and six part time collaborators, 28 Registered Nurses, 5 secretaries and 12 assistant nurses. Staff turnover has been high, which is unusual, generally speaking, in Spain. Sixteen physicians have rotated out of the Platform over 10 years. Professionals have left the Platform for various reasons, though mainly to transfer to another Hospital.

A detailed evaluation of the overall impact of the Platform's strategy on patient management is underway. To date, we have analysed the preliminary results in breast and colorectal cancer, based on the first ten years of operation,

One important finding is that patients with metastatic colorectal carcinoma experienced a median increase in survival of six months compared to current literature and historical data, and long term free of disease survival rate is of 12% (23). In early stages CRC cure rates have been very favourable as compared with current literature results.

On the other hand, patients with metastatic breast cancer also appeared to benefit from the integrative approach and presented a 5-year actuarial survival rate of 33% and a long term free of disease survival rate of 6.5% (24). In early stages breast cancer remarkable cure rates have been obtained.

Other treatment cohorts diagnosed with lung and prostate carcinomas are currently being evaluated.

Another interesting result from this novel form of organization has been the establishment of complex yet effective programs known as singular interdisciplinary procedures. These are listed in Table 2 and represent special techniques for the treatment of certain disease manifestations, including isolated extremity perfusion, intra-arterial chemotherapy, intraoperative radiotherapy, and intraperitoneal chemotherapy with hyperthermia. Two recently initiated, TEDECA funded projects, namely abdominal cancer surgery assisted by the Da Vinci Robot, and Tumor RNA Expression Microarrays to help select active chemotherapy in resistant tumors, may also become in the near future established singular interdisciplinary procedures.

DISCUSSION

Teamwork and an innovative multidisciplinary medical model are distinguishing features of the Platform of Oncology. The cumulative results thus far indicate that the day-to-day implementation of the multidisciplinary unit has abundantly surpassed our original expectations. The Platform's management and organizational model, based on a structure of horizontal relationships and composed of virtual units or domains, undoubtedly constitutes the most original aspect of the project.

Each domain has all the medical and non-medical health service professionals necessary to procure the best service for the cancer patient. This form of organization often leads to opportunities for new undertakings that had not been previously anticipated, thus facilitating the establishment of singular interdisciplinary procedures seen in Table 2.

This organizational model also allows us to constantly update knowledge in all fields of oncology and to define what emerging technologies can be of immediate help to the patient. It also enables us to increase and improve clinical research by making the best possible use of available data, samples and results, which reduces the expenses of clinical trials. Since there are no exclusions based on concurrent health problems or patient characteristics, it is possible to compile clinical, analytical and epidemiological databases in order to improve our knowledge of distinct pathologies and their treatment, and moreover to apply these factors to the general population, which often it is not well represented due to stringent patient selection criteria in the published trials In this manner too, all the patients can be able to enrol in networks in which personalized approaches can be directly tested.

The Platform of Oncology also functions as an interdisciplinary workshop where professionals can devise, incorporate and apply diagnostic and therapeutic advances, as can be seen by the development of conventional complex protocols and also in the interdisciplinary singular procedures listed in Table 2. These features leave participating professionals with the strong impression of belonging to a program with a valid instrument capable of meeting broader objectives.

At the same time, our novel approach has stimulated greater collaboration among the pioneering faculty members, which we have found more than offsets for what might traditionally be appear to be its somewhat fragile dimensions. The creation of the Platform of Oncology in a newly opened hospital lacking the customary departmental organization and structure was an advantage. The private and independent nature of the hospital also was particularly suitable for this endeavor. The development of this new model could have been critically jeopardized, if traditional departmental hierarchical and financial organization systems had been applied. In terms of health care facilities, the Platform of Oncology had to prove satisfactory amidst expectations of poor performance. In summary, an open structure like this is required by the interdisciplinary nature of the work, and has led to the minimization of conflicts of interests.

One potential drawback in the original conception and rollout of our program may have been the fact that it did not originate with the support of academic or healthcare entities. A more orderly approach, supported with a reserve of institutional funds and accompanied by an intelligent forecast of potential obstacles would have of course been preferable. We ourselves have noted that the way it was rolled out was at times too fragile. On the other hand, an innovative project such as ours can only become operational through unique procedures and sometimes unconventional approaches. It is difficult for institutions to undertake a project in which the model that it pursues breaks with its established structures and which runs up against the expectations of people in the traditional hospital healthcare model.

Given that this model has now begun to produce encouraging clinical results, it is time to consider its potential for wider applicability towards the overall management of cancer care. We live in a time of tremendously rapid and important advances in medicine. This creates new opportunities even as it introduces greater complexity; it remains difficult to make the most effective use of all available and emerging healthcare services in a single therapeutic plan. Professionals are inundated with a staggering quantity of new proposals, and lack capacity to undertake every possible new approach. Above all, greater collaboration among different specialists is needed to provide holistic services and to contribute to new knowledge. All these features confront health care organizations today, as they strive to transcend the limitations of the current systems and to build new paradigms.

Building teamwork is challenging, however, because competitiveness is a prominent feature of medical education and characterizes professional career development. This leads to high levels of competence and many other positive outcomes, but this does not mean that technical excellence is incompatible with the principles of solidarity. There is basic altruism in teamwork, which can be learned and taught. In building a competent and effective multidisciplinary working environment, it is essential to incorporate people with two main qualities: that they be outstanding professionals and also know how to work as a team. Complex medical problems can often be better approached through teamwork, as the collaboration of an interdisciplinary group can enrich the quality of services provided.

The beautiful and thought-provoking ancient Greek story of the mythical Jason and the Argonauts' quest for the Golden Fleece, in which men, heroes and half-gods collaborate

to form a team, is one of the most captivating, daring adventures ever told. Teamwork tends to arise naturally during times of serious crisis, when there is an urgent need to join forces to meet common objectives. It also becomes imperative when a wide range of specialists undertake projects of great scope and cost. This entails careful planning and a detailed organizational protocol. Results are only achieved by constant effort and, quite often, a period of learning.

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