

NETWORK

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THE PRESIDENT'S MESSAGE

THE COMMUNITY AND CANCER

Part 2. Civil Society
by Ian Magrath

...kings and persons of sovereign authority, because of their independency, are in continual jealousies, and in the state and posture of gladiators, having their weapons pointing, and their eyes fixed on one another.
Thomas Hobbes in *The Leviathan*

Parasites (*Paraseitos*), in ancient Greek theater, were men who arrived uninvited to dine at the table of a wealthy family. In return for food (*seitos*) they amused their hosts with stories and anecdotes, even subjecting themselves to ridicule and abuse in the hope of winning a permanent attachment to the family. The Roman plays known as *Fabula Palliata* (*pallium*: cloak - the origin of the word "palliative") were derived from Greek theater but the equivalent character to the *paraseitos* in Roman theater was the *cliens* (a vassal or dependent) who differed from the *paraseitos* in that his presence was dependent upon an invitation. The invitation,



Ruins of the Forum, the seat of political, religious, commercial and judicial activities in ancient Rome.

in fact, was what really mattered, since the ultimate goal of the client was self-aggrandizement, and in the strict hierarchical structure of Roman society, to be invited to dinner by a member of the elite was a mark of recognition. Patronage of this kind was an important element of Roman society. Poets, artists, politicians and a variety of other clients were generally beholden to a patron and accom-

panied him to the forum - the seat of political, religious, commercial and judicial activities in ancient Rome. Clients, of course, were subject to the whims of their patrons, a relationship that tended to induce sycophancy. Independence of mind, although not unknown, was fraught with hazard.

Entertainers willing to "sing for their supper" appear to have been ubiquitous in former times. Fools

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appear in the courts of Kings and noblemen in medieval and renaissance Europe, China, India, Japan, Russia and Africa - as did groups of comedians, actors and other entertainers, many of whom owed their livelihoods to their patrons. The foolery of court jesters, however, often provided more than mere entertainment. Since they posed no threat to the monarch's power or self-respect they were uniquely able, through parody, burlesque and even mockery, to criticize his policies and actions. In ancient Greece and Rome stage acting and Fool's coexisted; elsewhere it was the rise of the theater that led to the decline of the court jester. From that point forward, commentaries on the follies of Kings and governments had a public face, soon to be rivaled by the rise, where permitted, of independent magazines and newspapers. These elements of society, like the Roman clients, are peripheral to the main

societal structures, although they may still have a significant effect on decision makers by virtue of their role as societal mirrors. Unfortunately, also like the Roman clients, they are dependent upon patronage, which can affect their candor. Cartoonists and comedians, in contrast, can use the same powerful tools of the Fools of yesteryear to devastating effect, their humor serving now, as then, as a protective pallium.

TRICKSTERS

Jesters have existed since long before the emergence of cities and Kings. Many African and American tribes had their clowns, often dwarfs, for the jester is a mythological archetype who appears in one form or another in essentially all mythologies, being frequently referred to as the *Trickster*. A wise fool, the trickster points to the flaws in human societies, deflates the pedant, questions constantly and urges us not to accept things blindly. He (or she) is of particular importance when new ways of thinking, i.e., change from the *status quo* is required, helping us to cross the boundary from one state or set of ideas to another. In this guise, the trickster blends imperceptibly into the magician (magi) or alchemist, whose concern is life-transformation. Tricksters also merge with heroes - the North American trickster, Coyote, for example, like the Greek hero, Prometheus, stole fire from the Gods. From life saving hero, it is a small step to a savior god. Clearly, the trickster, in all his guises (tricksters can change form or sex, passing easily from animal to animal to human) plays a critically important role in human society. Jung characterized the trickster as "a collective shadow figure, a summation

of all the inferior traits of character in individuals," but he is surely more than this, reaching back, as he does, to our prehistoric psyche where he both represented the unpredictability of life and offered pointers as to how to live with this heavy burden. As such he is a precursor to many of the more well developed mythological and religious figures that later emerge on the tapestry of human cultural evolution. Perhaps he is the archetype of archetypes, capable, in parallel to life itself, of transmutation into a variety of forms that occupy a correspondingly broad range of psychological niches in many different cultures. And perhaps he still has much to teach us.

LEUCOCHLORIDIUM PARADOXUM

Remarkably, biological systems involving parasites include maneuvers that recall the psychological games of a trickster at points of transition. Ectoparasites such as fleas and lice, are able to simply move from one host to another, but internal parasites must rely on the behavior of the infected individual to make the crossing. The passage from an "intermediate" host, the site of larval multiplication, to the "definitive" host, which harbors the adult, can be particularly tricky. *Leucochloridium paradoxum*, a trematode flatworm that lives in the intestines of birds provides an illustrative example. *Leucochloridium's* intermediate host is a snail of the genus *Succinea*, which becomes infested through eating the eggs of the parasite, present in bird droppings. The eggs hatch and the larval worms (miracidia) feast on the snail's flesh - for the most part with only minor impediment to its daily affairs. Eventually the miracidia develop into sporocysts, which

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invade the snail's eye stalks, causing them to become swollen and brightly colored. The consequent diminished ability to perceive light results in the snail wandering from the shadowy recesses it normally prefers into exposed positions on vegetation. By now, it's tentacles, too swollen to be retracted into the snail's protective shell, closely resemble caterpillars - a tempting morsel for a passing bird and a vehicle for the worm's entry into its definitive host.

Rather more mundane than the tactics used by *Leucochloridium*, the all too familiar coughs, sneezes and diarrhoea are symptoms induced in people by sundry human parasites whose primary purpose is to affect the transition from one host to another. But not all parasites induce changes in behavior; many either make use of their host's normal behavior, or infest sub-populations with behavior that serves their needs. Sexually transmitted diseases, including those caused by Human Papilloma and Immunodeficiency viruses, provide examples of this kind as do the blood or liver flukes, whose intermediate hosts are aquatic snails. Only fishermen and farmers who wade in irrigation ditches, or others exposed to water in which larval flukes have been released by snails, are at risk for infestation. All of the human parasites mentioned, and many more, are associated with specific human cancers. Prevention of these and other cancers associated with human parasites (including microorganisms) can be accomplished by preventing invasion by parasites. In the absence of a vaccine, this may require changes in lifestyle or personal habits or, in some cases, treatment, as long as re-infection can be avoided. Unfortunately, human

behavior is notoriously difficult to change - because of lack of motivation or concern about the financial cost associated with change, or because of real or perceived benefits of the behavior. Explanations and warnings may sometimes work, but targeting specific sub-groups (e.g., young women, adolescents, men) with light-hearted or positive

If you smoke 20 cigarettes a day, you will save € 2,080 each year if you quit.
In 5 years you could buy a half decent car and in ten years a nice sports model!
Since the price of tobacco continues to rise, quitting could buy you a serious motor.

*Irish Cancer Society in:
The MANual on Men for Cancer
Prevention and Early Detection*

messages that use the techniques of a trickster, and that touch upon issues of particular importance to the target population, may prove to be more effective in promoting the transition to healthier behavior (see panel). Such techniques have been used by the tobacco industry with devastating effect.

PARASITISM: A RECURSIVE ECOSYSTEM

The notion that parasites take a "free-ride" on (or in) another organism is at best a gross oversimplification. Parasitism, rather, is a form of recursive coexistence - a process whereby one organism imbeds itself in another. This is of enormous importance

to evolution, which is powered by adaptive radiation - i.e., the creation of diverse life forms in relationship to new habitats. In the case of the host/parasite relationship, habitats are provided by the life-forms themselves, thus dramatically expanding the capacity of the ecosystem to support biodiversity and creating new possibilities for cooperation among quite unrelated species in the exploitation of still more habitats. In this regard, parasitism was a key process in a major evolutionary step in which the molecular pathways required for aerobic respiration and photosynthesis, which had evolved in certain prokaryotic cells, were transplanted into other cells. The endoparasites eventually became vital elements of a new cell type - *eukaryotic cells* - whose properties permitted the cells to associate in a remarkable manner not possible for prokaryotic cells. Plants and animals, comprised of large numbers of highly specialized eukaryotic cells whose lives were ineluctably bound together (and routinely sacrificed for the good of the entire organism) could now emerge.

Notwithstanding the crucial importance of parasitism to evolution, humans tend to have a dim view of the process, since many diseases are caused by human parasites. Under natural circumstances, the closely linked host/parasite relationship hovers around an equilibrium similar to that between predators and their prey, since the goal is mutual sustained survival. The balance is created by the "invisible hand" of nature, whose actions are mediated via numerous genetic and environmental factors that vary among sub-populations of both host and parasite, and in different habitats

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or regions. Genetic changes in the one (host or parasite) automatically result in the selection of those traits in the other that lead to reestablishment, over time, of the equilibrium. Long-established host-parasite relationships evolve towards benefits to the parasite with no significant harm to the host (commensalism) or to a situation of mutual benefit which can lead to mutual dependence (symbiosis). Conversely, harm, i.e., highly debilitating disease, is more likely to occur when parasites gain access to hosts they do not normally parasitize - either through unusual circumstances, or because one or more specific genetic changes have permitted colonization of a new host. A contemporary example is the transition of HIV from monkeys to humans. This is similar in principle to the entrance of an alien species into a stable ecosystem, either through chance (e.g., inadvertent transportation or migration of several individuals to a new location) or through the rapid emergence, in evolutionary terms, of a new organism. In either case, the resultant disturbance in the ecosystem may be sufficient to cause a significant reduction in biodiversity. The most extreme example of this is the sudden emergence of *Homo sapiens*, which has resulted in a catastrophic effect on biodiversity of the order of magnitude of previous mass extinctions. Purposeful or inadvertent changes in ecosystems caused by humans (e.g., resulting from the agricultural revolution, or the introduction of alien species into a habitat) have amplified the problem, and have sometimes led to unexpected results, including the potential to increase the risk of cancer (Figure 1). Increasingly, humans have adapted to habitats through

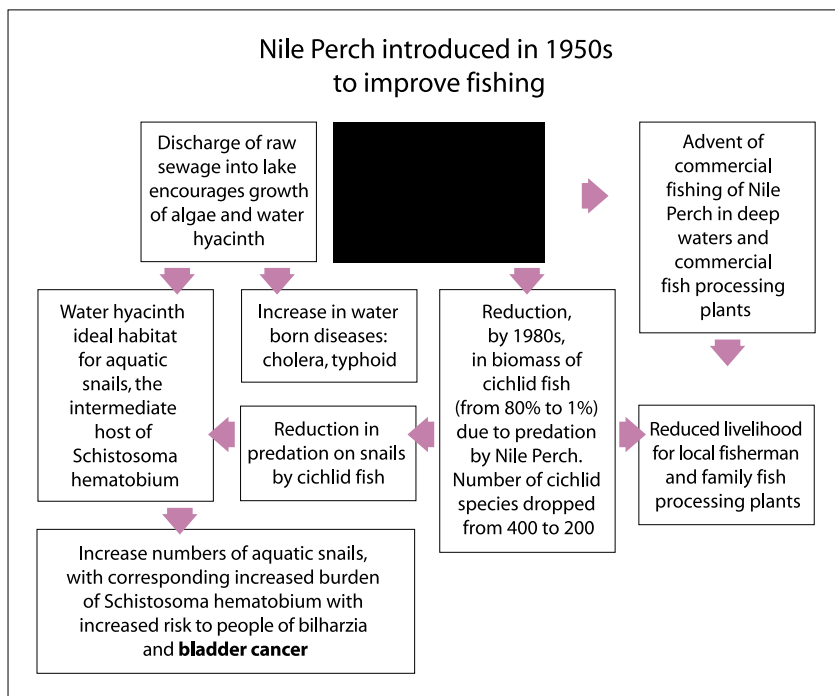


Figure 1. Cascade of effects on the ecology and economy of Lake Victoria resulting from the introduction of the Nile Perch. Civil society has responded: an East African non-profit association, Lake Victoria Organization has been established to coordinate efforts to save the lake.

the use of tools rather than through genetically driven changes in their bodily structure, thus enabling them to adapt much more rapidly than other organisms and seemingly nullifying, to a large extent, the biological processes that normally lead to a restoration of ecological harmony and to a continuous increase in biodiversity. If this is so, then either human wisdom or human folly will be Nature's final recourse.

DEGREES OF FREEDOM

In general, parasites, appear to be an epiphenomenon with respect to the primary food chains. This does not prevent them having a significant influence on the ecosystem with which they are associated. In some senses, parasites might be considered regulatory elements of eco-

systems, comparable to the epigenetic regulation of gene expression in cells (which results from chemical changes in the chromosomal environment of genes), a process that, if abnormal, may sometimes contribute to the development of cancer. At a different level, the influence of parasites on ecosystems may also be compared to the modulating influence on human relationships of the ancient parasites and their descendants in modern societies - an effect which, at times, has changed the course of human history. These seemingly spurious parallels are not as tenuous as they might, at first, seem, since all three reflect deep biological principles. Evolution, however, permits additional layers of complexity and, consequently, extraordinary new possibilities, for

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each additional layer is a system in which the units are the previous systems, and each system is much more than the sum of its parts. In cells, gene-environmental interactions, however complex, are mediated exclusively by molecules. In animals, the evolution of a nervous system permits higher order behavior and maximal use of form and physiology. Behavior now, can be based on learning (which involves memory) and even an element of freedom of choice. Freedom of choice is most highly developed in humans - so much so that mind, as articulated by Descartes, was, until recently, thought to be quite separate from the physical structure of the brain and therefore not a biological phenomenon; freedom appeared to be unrestrained. Today, the conclusion that behavior, including social behavior, has a genetic foundation in all animals is inescapable, although this becomes less apparent as the importance of learning increases. In ants and bees, where learning is confined to tightly prescribed circumstances (e.g., in pathfinding), genes influencing behavior have already been identified. In humans, correlations between brain structure and function have been known since the nineteenth century, but correlations between brain physiology and certain types of behavior (including social or "ethical" behavior) have only recently been made and studies of the genetics of behavior are in their early stages. A principle, however, seems to be emerging: genes can influence what can be learned and how well, and probably also confer constraints on imagination, which, after all, is merely the recombination of remembered ideas. Freedom is limited.

THE COMMUNITY AS INDIVIDUAL

Animal communities are also recursive in the sense that they are comprised of individuals within a system that functions as an individual in the context of the larger ecosystem to which it belongs. Consequently, the well-being of the community is more important than that of the individuals who comprise it. The importance of community to humans could not be greater, although it is often taken for granted. Almost all human endeavors are cooperative, either in real time or over time. Millions have contributed in the course of millennia to the evolution of complex machines from paleolithic axes, permitting the automation of manufacturing and a resultant enormous leap in productivity. And just as co-evolution (e.g., of animals and plants), with respect to both structure and function, has led to wider and more rapid colonization of the planet by living organisms, so the combination of community and communication (through language) has been central to human cultural evolution and dispersal. But this very success has ensured that expanding communities will increasingly compete for territory or ideas. Communities, like individuals, may also become diseased - i.e., individual benefits of a particular element of society become increasingly separated from community benefits (a parallel to cancer in individual organisms and to imbalance in ecosystems). New community elements introduced from other communities are not unlike parasitism. The ability of a community to defend itself against disease, e.g., by turning "parasitism" into symbiosis, or maintaining balance in its component

parts, depends upon the strength of its institutions and the mechanisms it uses to retain its integrity. One of these mechanisms is civil society.

CIVIL SOCIETY

The nature of human society has been debated since antiquity. Aristotle, in the *Politics*, describes the Greek communities living in city-states - *polis* -, as "an association of associations." He believed that the natural tendency of people to live together in communities allowed them sufficient security and stability to be able to pursue "virtuous acts"- i.e. those acts required of them as citizens, which provided benefits to both the individual and the community. The walled city-states, common to all ancient civilizations, had evolved from the earliest agricultural settlements. Their well planned streets and substantial communal buildings (including temples) reflected the underlying sociopolitical structures, while their small size compared to modern states ensured that the benefits of the polis (which did not, incidentally, include slaves and foreigners) to the individual, and vice versa, were obvious to all. Aristotle regarded the polis as "civil society" in contradistinction to the "animal-like state of the outlying tribal communities, which at times amassed into large groups capable of laying waste to the city-states." The classical concept of civil society, then, which persisted well into late medieval and Renaissance Europe, encompassed both the government and the governed. Hobbes perspective, for example, was not greatly different from Aristotle's. He referred to civil society in the context of politically organized commonwealths in which the sovereign authority could legitimately take from its citizens what

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was needed in order to command the necessary power to overcome the “... *dissolute condition of masterless men without subjection to laws and a coercive power to tie their hands from rapine and revenge.*” Hobbes was under no illusions with respect to the rapine and revenge that sovereign powers (whether a man or an assembly of men) heaped upon each other, but did not feel this to be incompatible with sound government within the commonwealth.

The rapid growth of the merchant classes between 1750 and 1850 caused a major restructuring of society and a significant modification to the concept of civil society. Increasing mobility resulted in communities being frequently comprised of strangers rather than families living in close proximity for their entire lives. Meanwhile, the newfound wealth of the merchants and their desire for independence from the ruling classes, coupled to changes in the traditional hierarchical structures brought about by the French and American revolutions, led to rapid growth in the number of voluntary associations, particularly in the United States. Their role was seen as confronting and curbing the power of centralized government, particularly with respect to newly realized individual rights and freedoms (although, as in the city-states, such rights were not accorded to all inhabitants). Alexis de Tocqueville, a Frenchman sent to observe the American social experiment in the early 19th century, was particularly impressed by the number of such associations he found, and he and many of his contemporaries came to view these associations, rather than the state as a whole, as constituting civil society - a view that was reinforced in a later era in the con-

GOVERNMENT

- Ratification of the World Health Organization's Framework Convention on Tobacco Control
- Introduction of legislation pertaining to tobacco use as per the FCTC
- Introduction of legislation pertaining to other risk factors (e.g., chemical exposure)
- Introduction of legislation ensuring opioid availability for palliative care
- Establishment of a National Cancer Control Committee
- Implementation of the World Health Assembly Resolution of May 2005 on cancer prevention and control; in particular, development and implementation of a national cancer control plan
- Ensure appropriate educational systems for health professionals are in place
- Coordinate the evolution of an equitable health system
- Ensure, as far as possible, that institutions needed for cancer control are established
- Ensure, to the extent possible, that necessary equipment and drugs are available
- Ensure highest possible level of access of the population to appropriate cancer care
- Provide moral and financial support for cancer control

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- Advise the government with respect to the importance of cancer as a health problem
- Advise and support the government with respect to its role in cancer control
- Ensure access to, or collect relevant data on which to base the cancer control plan
- Undertake demonstration cancer control projects that, if successful, can be scaled up
- Disseminate results of cancer control projects
- Develop or participate in the development of guidelines on how to establish and implement cancer control programs
- Provide additional funds for cancer control, e.g., for drugs, equipment, staff salaries
- Participate in or support relevant professional and public education
- Provide psychosocial support to patients
- Participate in service delivery
- Raise funds from the public, government and industry for cancer control

INDUSTRY

- Provide effective products for cancer control
- Conduct or support locally relevant research involving its products
- Participate in professional education relevant to the conduct of relevant research
- Provide selected services
- Provide unrestricted financial support to civil society

¹ These roles are not exclusive, and frequently overlap

² This is not an exhaustive list

³ 100 countries had already ratified the convention by the deadline of November 8th 2005

Table 1. Some of the Roles of Societal Elements in Cancer Control.

text of Eastern European dissidents. Although merchants continued, for some time, to be considered part of civil society, the growth of commercial organizations to the point that many came to straddle many communities, even states, and often held considerable sway over governments on issues affecting their own well-being, led to a further narrowing of the concept of civil society. It is now generally considered to include only the complex of voluntary associations (non-governmental, non-profit orga-

nizations, being, for many, the central element), that provides the public with both a voice and the ability, through raising awareness and mobilizing resources, to influence a broad range of societal issue, particularly in the domains of justice, equality and health. And although the boundaries of civil society are imprecise and vary in different cultures, it embodies the idea that individual freedom is possible only in the context of a healthy community, the creation of which is its primary purpose.

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Not all voluntary associations are directed towards goals that will benefit society and a strong argument can be made for limiting the definition of civil society to those associations devoted to the public good. This includes responsible journalism, which should ensure that the public are well-informed on a variety of issues that affect their well-being. If voluntary associations are to have a positive impact, they must embody more than simply good intentions. They must be managed, or at least advised, by persons with appropriate knowledge and skills, and remain free from excessive influence by patrons (e.g., through seeking at least some of their funds directly from the public). Many professional associations, for instance provide a unique repository of knowledge and skill that is likely to greatly exceed that of the government in specific areas of endeavor, such as health, education, science and human rights. Even when professionals are employed by the government, their powers as employees differ greatly from those of the professional associations to which they belong to. But as long as governments maintain a monopoly on legislation and coercive powers, the influence of voluntary associations should not be overestimated. Nor should the dependence of civil society on both government and industry be underestimated. Civil society requires at least a tolerant government, and better, a democratic form of government, if it is to grow and develop, or even openly exist. At its best it can do much to lessen inequalities and to promote causes that may be overlooked by the government, purposely, or through lack of knowledge. It may also draw attention to societal diseases. Some of the roles of civil society in cancer control are shown in Table 1.

GLOBAL CIVIL SOCIETY

Broad international consensus is essential to dealing effectively with the overarching issues of human rights, poverty, equality of opportunity, peace and security, health, economic globalization, environmental protection, climate change and nuclear proliferation, for each of these transcends national boundaries. Consequently, none of these problems can be effectively addressed without simultaneously addressing the problems of developing countries. A particular problem of our times is the frequent close relationship between big business and government. This creates the potential for serious societal injury for each tends to foster its own interests (respectively, power and profit), with limited regard for weaker elements of society represented, at a global level, by developing countries. A three-way alliance among government, industry and civil society is likely to lead to a healthier society. In the international arena, an intergovernmental organization (i.e., a voluntary association of governments), the United Nations (UN), takes the role of national governments in states, but its power is determined by the extent to which individual governments are willing to cede their powers. This tends to be inversely proportion to their global influence, i.e., the richest and most powerful countries are the least willing to yield to international consensus. A healthy global civil society, comprised of international organizations and international networks of national organizations, is needed to strengthen existing intergovernmental organizations and to advocate and act on behalf of a "global good" society that strives to reduce inequities and to address problems that threaten to cause, or are already causing, serious damage to the planet and its people. Cancer is just

one of these. Fortunately, the marked increase in the number of non-governmental organizations in consultative status with the UN in recent decades suggests that civil society is alive and well and rapidly becoming a major actor on the world stage (Figure 2).

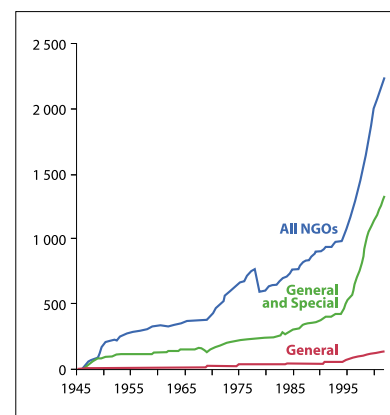


Figure 2. Numbers of various type of NGOs in consultative status with United Nations Economic and Social Council by year.

Biology teaches us that diversity creates new opportunities for collaboration, for creation and for mutual evolution. Civil society, with its variegated and ever-changing form can be seen as the human equivalent of the biological invisible hand that leads to ecological harmony, although mind-born, its strategies are based on observation and intelligent intervention. The remnants of the polis, fused now into human society in its entirety, just as the prokaryotic cells that had learned to derive energy directly from the sun and to breathe the resultant oxygen were fused into eukaryotic cells, give hope that the era of individualism in which we live will prove to be the adolescence of the human race - one that, with the trickster's help, will bloom into a maturity in which human beings become stewards of the planetary ecosystem rather than its despoilers. ■

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THE INTERNATIONAL ATOMIC ENERGY AGENCY'S PROGRAMME OF ACTION FOR CANCER THERAPY: TREATING CANCER IN THE DEVELOPING WORLD

The International Atomic Energy Agency (IAEA) is well known for its role in safeguarding nuclear material and preventing nuclear proliferation. Less well known is the IAEA's second mandate: advancing the peaceful application of nuclear sciences and technology, which are now used extensively around the globe to support industrial applications and to combat disease, poverty, hunger, and shortages of drinking water.

Transfer of radiation medicine to developing nations, including the diagnosis and treatment of cancer, is an area in which the IAEA has excelled. Nuclear techniques are central to modern medicine. They are important tools for the diagnosis and treatment of many diseases and are indispensable in cancer care, where radiation therapy plays a fundamental role.

The IAEA has worked in developing countries over the past 30 years to deploy essential elements of sound cancer management programmes. Since 1980, the IAEA has delivered \$150 million of cancer-related assistance under its Technical Cooperation Programme to developing countries. This assistance has involved more than 100 countries and has enabled many to establish safe and effective radiotherapy capabilities (Figure 1).

Cancer is a global problem today, and its prevalence will increase dramatically over the next decade, especially in the developing world. According to the World Health Organization (WHO), 12.5% of all deaths worldwide are currently caused by cancer, a greater percentage than caused by HIV/AIDS, tuberculosis and malaria combined. The International Agency for Research on Cancer (IARC) predicts that cancer rates will increase by 50%, from 10 million

IAEA resources for strengthening cancer programmes will remain at about \$15 million per year, this level of funding will fall short of what is needed in developing countries. As a result, PACT will seek additional funding from private sources such as foundations, charities and industry to assist developing countries in building capacity to prevent, treat and cure cancer patients.

PACT offers a crucial element in the global response to the growing



Figure 1. World map showing IAEA assistance in RT transfer.

new cases in 2000 to 15 million new cases by 2020. The largest rates of increase of new cases are foreseen in developing countries, where governments are least prepared to address the growing cancer burden.

In 2003, WHO issued a global call to action to address rising cancer needs. The IAEA answered this call in June 2004 by establishing the Programme of Action for Cancer Therapy (PACT). While the

cancer burden. Radiotherapy is a mature, robust and cost-effective technology that can, depending on the stage of clinical presentation, cure many cancer patients and relieve others' suffering. Patients with various stages of cervix, breast, larynx and prostate cancer can be cured, for instance, while a single dose of radiotherapy can relieve malignant bone pain for weeks or months, thereby decreasing or eliminating the need for opioids.

Currently, however, radiotherapy is not available to most cancer patients in the developing world.

PACT is designed to respond to the needs of developing countries by addressing the technical, human resource, legal, and regulatory needs to establish, improve, or expand radiotherapy programs in the context of sound national cancer control strategies. PACT, in collaboration with partners, will develop a systematic, global, sustainable and accountable programme to prevent and treat cancer throughout the developing world.

Specifically, PACT will: (1) build an international, public-private coalition of interested parties committed to addressing the challenge of cancer in developing countries in all of its aspects; and (2) mobilize resources from foundations, charitable trusts, industry and others in the public and private sectors for the benefit of cancer patients. PACT will build partnerships among countries, with other UN institutions such as WHO and IARC, and other international stakeholders including NGOs such as UICC and INCTR. In addition to securing resources for radiotherapy centres, PACT will respond to the most frequent problems encountered by developing countries in building effective cancer control infrastructure.

In order to assist countries in the analysis of options and to build cancer therapy programmes appropriate to needs, PACT will:

- Increase capacity within ministries of health and other health sector institutions to formulate policies and set priorities for investments in radiotherapy. According

to WHO, “many policy makers do not attach enough importance to the provision of good radiotherapy. Although it has a strong clinical background, its role has not been understood as well as other cancer treatment modalities such as surgery and chemotherapy.”

- Provide training, management skills and other resources that will help institutions leverage the initial investments in trained staff and equipment towards safe, effective, and sustainable operations.

- Promote the development and implementation of effective, well balanced national strategies for cancer control, including the generation of surveillance data to ascertain local cancer disease burden, care needs, and outcomes.

- Enhance technical, legal and administrative capabilities to establish and implement regulatory systems, including those appropriate for radiation protection, safety and security.

PACT invites organizations sharing an interest in advancing cancer care in developing nations to partner with the IAEA in a global effort to respond effectively to the WHO call to action. PACT seeks organizations with pertinent developing world experience and capability in cancer control, including but not limited to radiation oncology, cancer screening and diagnosis, cancer prevention programmes, fundraising, programme impact evaluation, epidemiology and outcomes research. Interested parties should contact PACT at PACT@iaea.org to learn more, or volunteer support. ■

Massoud Samiei, PACT, IAEA, Vienna, Austria.

LABORATORY MEDICINE IN DEVELOPING COUNTRIES: NEED FOR IMMEDIATE IMPROVEMENT

Pathology is the keystone on which the edifice of scientific medicine is erected. It is especially important for cancer management. Although it is usually a surgical pathologist who comes to mind in the context of cancer, a wide variety of laboratory-based disciplines (e.g., histology, hematology, clinical chemistry, and microbiology) contribute to nearly all of the elements necessary to effectively control cancer. A lack of reliable and efficient pathology service can result in serious consequences for the patients as well as obscuring the true picture of the problem in an entire country.

Clinical laboratories have achieved significant improvements in the provision and quality of diagnostic tests. Automation, commercially produced reagents and computers are providing clinical oncologists with an ever-increasing list of rapid and cost-effective tests. Advances in pathology have occurred in concert with analytical developments that measure many different molecules with specificity for cancer or associated conditions, and with ever-increasing sensitivity. Such tests have revolutionized clinical diagnosis in ways that were unimaginable even a decade ago. As a consequence, pathologists and their departments, at least in most developed countries, are expected to meet stringent technical, management and quality-assurance standards.

It is unfortunate that the number

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and quality of clinical laboratories in developing countries leaves a lot to be desired. Although a few top-of-the-line laboratories in these countries compare favorably with those in developed nations, their number is very small. However the vast majority of cancer patients do not have routine access to such laboratories. The first medical encounter with the patient is likely to be in a small, poorly run establishment without access to the necessary diagnostic tests, where the significance of non-specific symptoms, such as fever, fatigue, pain or lymph node swelling - potential pointers to a diagnosis of leukemia or another form of cancer - may be assumed to be caused by an infection or other common disease, and the diagnosis of cancer missed.

In many developing countries, opening a laboratory is as easy as opening a grocery store - or rather, opening a grocery store may be more complicated! A pathology laboratory can be established without requiring permission from any government or professional association. There is no paperwork since there are no regulations governing the management or quality of laboratory practice and no license is needed. The factors determining the performance of a pathology laboratory include good equipment, reliable reagents and trained, conscientious staff, but many laboratories compromise on such vital prerequisites. In many cases, retired laboratory technicians and other, often entirely unqualified people, open small pathology laboratories, where standards are not maintained since their knowl-

edge is limited. The managers earn money by using outdated machines, compromising on the reagents and by employing technicians in place of pathologists able to interpret the test results properly and to ensure the achievement of minimal technical standards. Yet the pathology laboratory should provide a vital part of the management of any cancer patient - any lapse or mistake in the performance of tests can lead to serious harm whether at the diagnostic stage or in the course of treatment.

CAUSES OF POOR PATHOLOGY SERVICES

There are numerous causes of poor services in pathology laboratories, the primary one being failure to follow regulations, or in some cases, to develop relevant regulations. The reasons for this are many and varied, but professional pathologists as a whole must share the responsibility for tolerating inefficient or flagrantly incorrect practices. The following factors are especially pertinent:

- *Low Budget.* In most developing countries, health care is primarily funded from general government revenue without charging the consumers. The expenditure on health is very low to begin with. It is, per capita, less than one quarter of what developed countries spend and often very much less. Moreover its distribution amongst the various sectors is inequitable. Most funding is spent on high-profile projects in teaching institutions in large urban centers. Laboratory services do not command a high priority.
- *Scarcity of Laboratory Staff.* The

tremendous progress in the field of laboratory medicine has made accurate assessment and monitoring the progress of an ailment much easier. The result has been a great surge in demand for pathology services. It is unfortunate that the availability of laboratory personnel has lagged far behind. In addition, there is significant migration of trained manpower to more lucrative markets abroad. The exact number of pathologists working in Pakistan, their background and qualifications has not been determined. However, according to one estimate, there are no more than 1500 pathologists, or about 10 per million of the population. By contrast, a developed country, such as England, has 109 pathologists per million. Support staff, such as technicians, are in even shorter supply. In Afghanistan there are hardly any at all. In Brazil, until a few years ago, pathologists outnumbered technologists. There is no doubt that a huge gap exists between supply and demand.

- *Poor Training.* The training of pathologists and technicians leaves much to be desired. Most general pathologists have received as little as nine months training in four major subjects. Only in recent years has training been improved to acceptable standards. Similarly, many technicians receive only on-the-job training, with little formal education. The quality of the work of such a body of inadequately trained personnel is bound to be substandard.
- *Lack of Appropriate Equipment and Infrastructure.* Laboratory equipment is mostly manufactured in industrialized countries.

It has become increasingly more sophisticated. The procurement officials in developing countries usually buy such fancy gadgetry for purposes of prestige rather than to make full use of its capabilities. There is no infrastructure for maintenance, or even an assured supply of electricity. It is therefore not surprising that developing countries are known as graveyards of equipment. It takes less than one year for some machines to break down in some way and approximately 60-80% of laboratory equipment is estimated to be non-functional.

- *Lack of Regulatory Mechanisms.* There is no license required to establish a clinical laboratory in many developing countries. In Southeast Asian regions of the World Health Organization (WHO), only two out of seven countries had accreditation programs. There are no rules or training requirements for non-pathologist physicians who run or lend their names to laboratories.

- *Lack of Continuing Education.* At present there is almost no provision for continuing education for pathologists. It is usually not required by the institutions who initially award them degrees. The result is that most do not keep up with advances in the field. Yet in such a fast-moving area, it is important that pathologists remain up-to-date with ever-changing terminology, as for example seen in lymphoid neoplasia and newer diagnostic tests. Use of non-standard terminology can lead to inappropriate therapy – it is essential that the nomenclature and classification used is widely understood not only within the country, but also abroad.

STEPS NECESSARY FOR IMPROVEMENT

A number of steps are required of governments as well as professional associations to improve to the current situation:

- *External Quality Assessment (EQA).* A system of EQA including laboratory licensure, accreditation, certification and proficiency testing has to be introduced to provide recognition to those who conform to acceptable standards. The current international requirements would perhaps be too stringent for the vast majority of existing labs. It may be necessary to evolve a system by which such laboratories are included in a simpler quality assurance program and are gradually brought up to international standards over a period of time.

- *Training greater numbers of qualified Laboratory Staff.* Quackery, in large part, is a reflection of the supply/demand gap. As the number of qualified pathologists is small, their place is taken up by quacks (unqualified non-medicals/untrained physicians). The supply of qualified pathologists can be increased by providing more training opportunities both within the developing countries themselves and, in some cases, abroad (although this is more expensive and entails the risk of economic migration). It may be helpful to arrange short visits by foreign experts. The non-qualified physician can be trained to undertake limited pathology work by providing them with the necessary training. There used to be a system of clinical side rooms attached to all wards where medical trainees carried out basic

laboratory tests (e.g., urine and simple blood tests requiring, for example, dip-sticks). This needs to be reintroduced and strengthened.

- *Telepathology.* In view of the dearth of trained laboratory staff, telepathology could provide immediate relief by making expertise available electronically via the Internet or multiple telephone lines in far flung areas. This approach could also be used at an international level for both consultations and training, including continuing education (which, at least for qualified pathologists, considerably overlap).

- *Suitable Technologies for Developing Countries.* There is a plethora of in vitro diagnostic devices available in more developed countries. Equipment and reagents appropriate to the needs of developing countries should be introduced. A system similar to WHO's essential drug list (essential laboratory tests) has been proposed. Pathologists should be trained in such techniques as fine needle aspiration and cytology. These procedures are quicker, less expensive and require less elaborate infrastructure and equipment such that they could be more rapidly and more widely introduced.

The improvement in pathology services will be a slow process. It is however imperative that a beginning is made so that the suffering of patients is reduced and cancer control is brought onto a more rational and firmer footing. ■

*Manzoor Ahmad,
Rawalpindi, Pakistan*

NETWORK

PRIMARY OSTEOSARCOMA OF THE STERNUM IN A CHILD

Osteosarcoma is the most common malignant bone tumor of childhood, occurring particularly in the age group between 11 and 19 years¹. The prevalent site of this tumor is the metaphyseal portion of the long bones, especially in the distal third of the femur, followed by the proximal third of the tibia and, in third place, the proximal third of the humerus. These three sites account for approximately 80% of osteosarcomas in childhood.

Primary tumors of the sternum in childhood are very rare; they are generally malignant and comprise only 0.3% of sternal tumors in all age groups². And while 7-8% of all bone tumors in children and adults occur in the chest wall, only 1% of these tumors arise from the sternum³. The purpose of this report is to discuss the management of a child with an unusual presentation of osteosarcoma.

CASE REPORT

The patient was a 14-year-old teenage girl who presented three

months prior to her admission to our institution with a mass over the sternum and progressive respiratory difficulty. On physical examination the patient appeared pale and had normal vital signs except for a respiratory rate of 65 per minute. A hard, fixed mass of 10 x 15 cm. was located over the superior region of the sternum and the patient was observed to be in respiratory distress. The initial chest X-ray demonstrated increased density as well as osteoblastic lesions in the sternum. The tumor was present throughout the extent of the sternum and extended into the mediastinum, although to a minimal extent (Figure 1). There were no abnormalities in the lungs. The chest CT scan showed complete involvement of the sternum by a mass of heterogeneous density containing multiple deposits of calcium as well as new bone formation, and confirmed the extension of the mass into the mediastinum (Figure 2). Bilateral pulmonary metastases were also observed. An open biopsy was performed and histopathological examination was consistent with a diagnosis of osteoblastic osteosar-

coma. The patient was treated with neoadjuvant chemotherapy, which included cisplatin 120 mg/m² and doxorubicin at 90 mg/m², both on day one, alternating on week two with ifosfamide 13 gm/m². After six courses of this chemotherapy combination, a repeat CT scan of the chest demonstrated that the tumor size was reduced by 50% and now manifested areas of necrosis and additional calcification. Pulmonary metastases persisted.

The patient was submitted to a complete surgical resection of the tumor mass and an external prosthesis was placed over the sternum. The pathology report at this time revealed 95% viable tumor with positive tumor margins. In the postoperative period the patient was given further chemotherapy with high-dose cyclophosphamide and carboplatin. However, after the first cycle was completed, and two weeks after the surgical procedure a repeat CT scan showed tumor regrowth (Figure 3). Shortly after, the patient developed sudden respiratory instability and respiratory failure with abrupt cardio-respiratory arrest resulting in death.



Figure 1. Chest X-ray showing a bone-forming mass in the sternum.

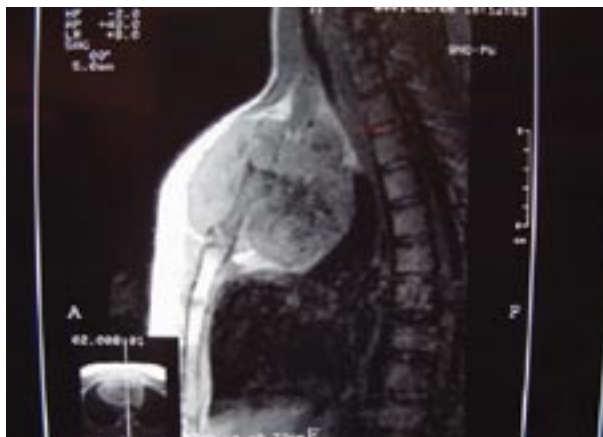


Figure 2. Chest CT scan, lateral view, demonstrating a solid osteoblastic tumor in the sternum.

CASE REPORT

DISCUSSION

Among the last 160 patients with osteosarcoma seen at the INP, this is the only patient with primary involvement of the sternum. It is generally considered that age at diagnosis (in children at least) is not a prognostic factor in osteosarcoma, but children under three, even though the disease is extremely rare in this age-group, could have an

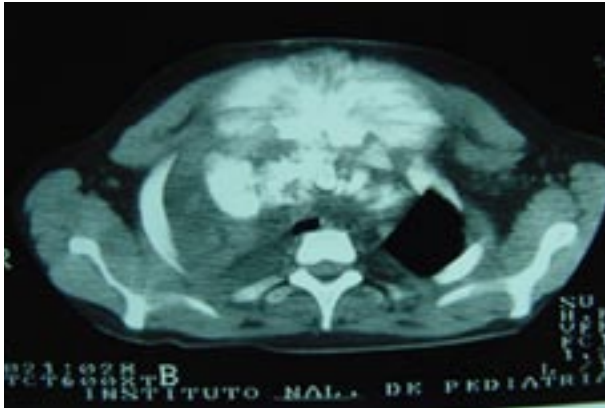


Figure 3. Chest CT scan showing that the osteoblastic mass extends beyond the sternum and involves the lung parenchyma bilaterally.

unfavorable prognosis⁴. The primary site of the tumor, however, is an important clinical prognostic factor⁵ and axial tumors are believed to have a poor outcome, at least in part because complete surgical resection is not possible in many of these patients. Another unfavorable prognostic factor that applies to the current patient is a tumor size of more than 15 cm. Probably even more significant for this patient was the finding that more than 10% of the tumor cells remained viable after neoadjuvant chemotherapy. Other prognostic factors worthy of mention are the overexpression of *p-glycoprotein*.

This is encoded by the MDR1 gene, which is associated with resistance to chemotherapy in osteosarcoma⁶ and the expression of epidermal growth factor receptor (HER2)⁷. These markers were not measured in the present patient, but could well have been present.

The traditional therapeutic approach to osteosarcoma of the long bones cannot be used in patients with axial presentation. The current approach to osteosarcoma of the extremities is to administer neoadjuvant chemotherapy and resect the tumor, whenever possible, with placement of a prosthesis - providing that the surgical tumor margins are free of tumor

cells. The demonstration that more than 90% of tumor cells are non-viable at the time of surgery is a good prognostic indicator. In patients with sternal tumors, unlike other axial forms of osteosarcoma, resection and the placement of a rigid prosthesis is possible, and is indicated when the patient is free of metastasis. This was not the case with the current patient.

From the surgical point of view it is of utmost importance to achieve a complete surgical resection in order to increase the probability of long-term survival. However, in patients with tumor involvement of the

sternum, resection is associated with a significant risk of instability of the chest wall, which can eventually produce fatal respiratory failure, as was seen in our patient.

In summary the possibility of osteosarcoma should be considered in the presence of a tumor mass in the sternum. The initial use of neoadjuvant chemotherapy and early surgical resection by an experienced surgeon, followed by additional chemotherapy, is the treatment of choice. ■

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NETWORK

A WORKSHOP ON RESEARCH METHODOLOGY IN LAHORE

A one-day Workshop on Research Methodology was held in Lahore, Pakistan, as part of the Shaukat Khanum Memorial Cancer Hospital & Research Centre (SKMCH&RC) Annual Meeting. Entitled "What you always wanted to know, but were afraid to ask", the program covered all aspects of clinical research, the emphasis being on practical advice for doctors-in-training.



Dr. Sultan Faisal explaining the process of ethical review at the meeting which took place on March, 13th.

Dr. Asim Amin began by addressing the ethical and practical questions involved in the design and implementation of clinical trials in oncology. Starting with the basic tenets of ethical research, he went on to define the objectives of Phase I, II and III trials, the relationship between them, and their limitations. Dr. Aziza Shad then described the roles of the individuals who comprise the Clinical Research Team, those who actually treat patients, and their relationship with the pharmaceutical house (if involved) and the "Contract Research Organization" (if applicable).

Dr. Faisal Sultan introduced the concept of the Institutional Review Board ("Ethics Committee") by referring to the notorious Tuskegee Syphilis study, conducted over a forty-year period starting in 1932. Four hundred, poor, black, American men were not told that they had syphilis and were not treated for it, even though penicillin was available from 1947. They were, however, offered free medical examinations, meals and even free "burial insurance." As a consequence of the study, numerous people died

unnecessarily and many of their wives and children were infected. Fortunately, times have changed. The principles of the Declaration of Helsinki, originally adopted in 1964 and subsequently modified, remain the ethical basis of clinical research to this day.

Dr. Sultan explained the process of ethical review, emphasizing

that consent is "a process, not a document."

Dr. Peter Tutschka and Dr. Stephen Spiro described ways of obtaining funds from abroad for clinical research in developing countries. They recognised that this was difficult, since most funding bodies are national, and pharmaceutical houses are not generally keen to support clinical trials in developing countries. Scholarships and fellowships do exist for people wanting to train in a specific technique or laboratory methodology.

Dr. Zeba Aziz spoke about the

importance of clinical research in Pakistan, using breast cancer as an example. She emphasized the necessity of assessing the feasibility and efficacy of a protocol in the country concerned, rather than extrapolating from results obtained under often very different circumstances in the West.

Dr. Ute Hamann and Dr. Suresh Advani went on to discuss very successful research projects conducted in Pakistan and India respectively. Dr. Hamann described a study in Lahore in which groups of newborn children from four different social strata were followed from before birth to five years of age. The study identified areas for intervention and has resulted in several community-based trials for improving maternal and child health in Pakistan.

I talked about how to write an abstract, often a difficult task because it has to be concise and yet convey the hypothesis or question being posed; it must also include the methodology, results and, of course, a conclusion. Above all, the abstract must contain data, otherwise it cannot be judged by the reviewers. Dr. Muhammad Jahanzeb gave advice about how to get a manuscript published. He discussed the most frequent causes of rejection by journals and suggested ways in which that these problems might be overcome. Dr. Nausherwan Burki discussed Writing grant Proposal, describing common pitfalls and misconceptions.

It was an enlightening day for everyone. ■

Ama Rohatiner, Director of Educational Programs, INCTR

CHILD FOUNDATION OFFERS HOPE OF A BRIGHTER FUTURE



The homeless street children of Iran, orphans in Afghanistan, earthquake and tsunami victims, children suffering, illness and exploitation — all receive aid from Child Foundation. And in the midst of wars, poverty and natural disasters, children with cancer are not forgotten.

Established in 1994 by three Iranian-born professionals now living in the United States, Child Foundation is an international non-profit organization providing basic living essentials such as food, shelter, clothing and medical needs to needy children. Mehrdad Yasrebi, a research engineer who designs ceramic medical devices such as joint replacements, is one of the founding directors. "The intention is to help any children who need assistance," he says, "but with emphasis on identifying children with high IQs who without financial support would end up quitting school or be forced into marriage at a very early age. We want to encourage them to continue their education."

The organization began by directing aid to Iran, but has since expanded relief efforts to Afghanistan,



Afghan refugees in the provinces of Khorasan (top) and Teheran (bottom) are just some of many underprivileged and underserved populations who benefit from Child Foundation aid.

Indonesia, India, Mexico, Bosnia and Turkey. Child Foundation will soon move into Iraq, as well. With six offices and teams of social workers in Iran, the Child Foundation identifies children in need of assistance

and offers monthly aid funded through sponsorships. The average expense for each child, Dr. Yasrebi says, is approximately \$90 per month, with 90% of those sponsorships provided by donors liv-

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ing in the United States. Charitable gala affairs celebrating Norooz, the Iranian New Year, and raffle sales provide additional revenues.

"There are approximately one million Iranians living in the United States, and many of them are doing quite well," says Dr. Yasrebi. "Once you start a charity, there are so many people who open their hearts to you. We have recently started seeing a broader base of donors beyond those in the Irani-American communities."

Last year, Child Foundation established a Lymphoma and Leukemia division. The new initiative is a response to the high incidence of these cancers occurring among children in a region encompassing Iran, Iraq and parts of Russia. The Child Foundation is interested in conducting research to determine why so many children are developing the disease, and to initiate programs to help prevent it.

Child Foundation's Washington Branch has been instrumental in supervising the cancer program and organizing medical treatment for children in their home countries and in the United States. Four children of Middle Eastern descent have been treated successfully at hospitals in the Washington, DC, area, and there are many more young cancer patients under sponsorship abroad.

In Orumiyeh, Iran, Child Foundation has a center housing cancer patients whose medical costs and other needs are supported by sponsors. Child Foundation also frequently sends medicine to other medical centers that are helping children with cancer.

"We are hoping to expand our outreach in this area," says Dr. Yasrebi. "We have a strong link with the Iranian American Medical Association, and

we are would like to send medical teams through them as well."

Other international aid partners include Red Cross, UNICEF, Doctors without Borders, Mercy Corps and INCTR. The Child Foundation and INCTR are collaborating on an initiative to help children in Bam. That ancient Iranian city was destroyed by an earthquake on December 26, 2003. INCTR is discussing the possibility of sending a medical team to the region to assess the local ability to care for children with cancer and to develop a plan to improve it. Efforts are also underway to send teams of doctors on a quite different mission – to provide plastic surgery to children injured in the earthquake. Meanwhile, the foundation is stepping up efforts in the area of nutrition, and expanding its sponsorship program to new countries.

Donations to Child Foundation are expanding at the rate of 40% a year, Dr. Yasrebi says, bringing its annual operating budget close to \$3 million. Organizers already are seeing tangible results. In Iran, only 15% of high school students are able to enter a university. Last year, 94% of those supported by Child Foundation continued their education beyond high school. "That keeps us going," says Dr. Yasrebi. "If you leave them alone, 90% will drop out of school. But given the opportunity, they can make a good life.

"The response of the Iranian community is also hugely gratifying," he says. "Iranians have a wide range of religious, political and cultural ideologies. Child Foundation is one of few charities that can unite all Iranians in achieving its charitable goals." ■

Marcia Landskroener for INCTR

MEETING OF SUB-COMMITTEE OF RETINOBLASTOMA STRATEGY GROUP

A subcommittee of the INCTR Retinoblastoma group met on 1-2nd April at the INCTR Offices in Brussels to finalize a treatment protocol for advanced retinoblastoma. The group was joined by an ophthalmologist, Dr. Barnoya, from Guatemala. There was general agreement at the termination of the meeting on the design of the protocol, which will be finalized this year. ■

BREAST CANCER STRATEGY GROUP MEETING

A meeting of the INCTR Breast Cancer Strategy Group took place at the INCTR offices in Brussels from 21st-23rd April. Dr. Bhadransain Vikram, head of the Therapeutic Radiation Department of the International Atomic Energy Agency to discuss collaboration between INCTR and IAEA in the conduct of protocols for early stage and locally advanced breast cancer. It was agreed that centers represented by INCTR's strategy group would participate in protocols for early stage breast cancer that will be used by centers in collaboration with IAEA, and the latter centers would collaborate in conducting the INCTR protocol for locally advanced breast cancer. Substantial agreement was reached with respect to the protocol design and it is hoped that this joint project will commence in 2006. ■

VISIT TO CAMEROON

Dr. Ian Magrath INCTR and Sabine



During a visit at the Solidarity Chemotherapy Association (SOCHIMIO) in Yaoundé, Sabine Perrier - Bonnet of AMCC (front center) and INCTR President Ian Magrath (third from left) met with SOCHIMIO President Paul Ndom (left of SPB) and other members and volunteers of the Cameroonian association.



AMCC representative Sabine Perrier-Bonnet (second from right) met with the health team and patients at Dr. Ndom's Oncological Department at the Hospital General in Yaoundé.

Perrier-Bonnet of AMCC visited Cameroon from 4th to 8th April to meet with the Cameroon National

Cancer Control Committee as well as the Minister of Public Health in order to discuss a collaboration in

which INCTR would work with the committee members in implementing selected cancer control activities in Cameroon. In the course of the visit, various hospitals and an NGO, Sochimio, were visited in order to gain an understanding of the major institutions in Yaoundé that will participate in the cancer control program. The conclusion was to move to develop a memorandum of understanding between INCTR and the Cameroonian Government relating to the collaboration planned. ■

INTERNATIONAL CONGRESS OF CHEMOTHERAPY

Various INCTR staff members participated in the International Congress of Chemotherapy in Manila, Philippines from 2nd to 7th June. Dr. Magrath spoke in the plenary session on Global Cancer Control, and the INCTR clinical trials office conducted a workshop extending over 3 days on the Value of Clinical Trials which was well attended and greatly appreciated. ■

ANNOUNCEMENT

INCTR's 7th Annual Meeting will take place in Sao Paõlo in the Spring of 2007. Dr Sidnei Epelman, Director of INCTR Brasil will be the local host. Additional information will be provided on INCTR's website in the near future.

NETWORK

CHILDREN CANCER HOSPITAL, KARACHI **A PROJECT OF CHILDREN CANCER FOUNDATION, PAKISTAN**

Pakistan is a developing country with a population of about 140 million people — of whom 45% are under 15 years of age. Malnutrition and communicable diseases are still the major killers of children. The country has a very limited health budget — only 0.7% of the gross national product is allocated to health.



Children Cancer Hospital, Karachi

The major focus of the government is on maternal and child health and infectious diseases. The level of health care is drastically different for the rich and poor. The 30-40% of people living below the poverty line have access only to government hospitals, where the facilities are far from satisfactory. Private sector hospitals have much better facilities, but are expensive and cater to patients from the upper socioeconomic class.

There is no national tumor registry. Most of the available information on childhood cancer comes from hospital-based data or data from IARC or other agencies which have small population-based registries in selected cities. Childhood cancers are more often diagnosed now due to better diagnostic facilities and the availability of treatment centers. With the decline in childhood mortality from infectious diseases, cancer is becoming a significant cause of death in children. The com-

mon childhood cancers in Pakistan are leukemia, lymphoma, soft tissue sarcoma, retinoblastoma, Wilms tumor and neuroblastoma. Only 3-4% of patients seen at our center have brain tumors.

The facilities for childhood cancer treatment in Pakistan are very few. There are eight to ten centers and only five fully trained pediatric oncologists in the entire country. Only a few hospitals in the government sector have a facility for the treatment of some children with cancer, but most do not provide free cancer treatment to children due to lack of funding. Therefore, almost all patients in government hospitals and 80% of those in private hospitals need financial support. Fortunately there are many charitable organizations supporting health care in Pakistan; philanthropists and non-governmental organizations support most government and private sector oncology services. One of these is Children Cancer Foundation, a registered charitable organization established in December 1999 by a group of medical professionals, social workers and parents of children suffering with cancer.

THE CCF MISSION

The majority of children referred with cancer to CCF need partial or full support for treatment. Initially, such support was provided by relatives and friends, but soon, the parents of children suffering with cancer and philanthropists joined hands with us to establish the Children Cancer Foundation. The Foundation's goals are to:

- Provide financial support for the diagnosis and treatment of children with cancer
- Create awareness about childhood cancer and its potentially excellent outcome
- Promote research and training within the specialty of pediatric oncology
- Establish a Children's Cancer Hospital in Karachi where

treatment could be offered to every child regardless of the ability to pay.

OUR EVOLUTION

We started our project with very limited resources but with a clear vision. We planned the journey in small phases and so far our progress has been very encouraging. We count among our major milestones:

- *February 2000*: The first office for Children Cancer Foundation was rented. An accountant and an office secretary were hired to run the cancer drug bank and maintain CCF accounts.
- *June 2000*: The office was moved to a private "polyclinic."
- *August 2001*: Children Cancer Hospital Phase 1 started functioning. The facilities included an outpatient clinic, daycare chemotherapy and pharmacy, and a procedure room for bone marrow examination and intra-thecl chemotherapy.
- *March 2002*: Inpatient admissions began with a seven-bed facility. By 2003 the growing number of referrals necessitated our own laboratory and x-ray facilities. With no room for expansion, we planned to move again. Although our funding was limited, we were able to rent a floor in a hospital.
- *May 2003*: Children Cancer Hospital Phase 2 became operational in our new premises. Our additional facilities included inpatient beds and more daycare beds, an isolation ward with four rooms, a medical record department, a laboratory and diagnostic X-ray facilities.

In the course of 2004, further additions were made, including an information technology department and hospital information system, a seminar room and a microbiology laboratory, an intensive care unit, an infection control team and a playground.

The average monthly outpatient and daycare admissions are 550 and 230,

PARTNER PROFILE

Leukemia	31%
Lymphoma	20%
Sarcoma	8%
Bone Tumor	8%
Brain Tumor	7%
Retinoblastoma	6%
Wilms Tumor	5%
Germ Cell Tumor	4%
Neuroblastoma	4%
Others	7%

Table 1: Common Childhood Cancers (figures derived from 764 patients seen at Children Cancer Center between March 1997 and March 2005).

respectively. We have on average eleven patients admitted in the ward. At present, we are treating more than 150 new patients a year. More than 50% are treated free of charge, 30% pay partially, while only 20% pay the full cost of treatment. We recuperate only 20% of our monthly expenses from patients, while we generate the rest from donations and zakat (a wealth tax paid by affluent Muslims). This support comes mainly from the community and other charitable organizations.

The number of cancer referrals has increased from 55 in 2000 to 218 in 2005. We have maintained our institutional tumor registry since our founding. The major childhood cancers treated at our center are leukemias (31%) and lymphomas (20%) (Table 1).

About 20% of children are given palliative chemotherapy or supportive care because of advanced or unfavorable disease (e.g., stage IV neuroblastoma and sarcomas). Approximately 10% of patients are lost to follow-up.

One of the main reasons for a poor outcome of cancer treatment in Pakistan is lack of awareness — not only among the general public, but also among medical professionals. Children Cancer Foundation and Children Cancer Hospital have, therefore, created awareness about child-

hood cancer and its possible excellent outcome through lectures, articles and interviews in newspapers and magazines. We have published educational leaflets for parents on various topics related to childhood cancer. The unit is actively involved in clinical research, and we have presented our data regularly in national and international meetings. There are regular awareness seminars and clinical meetings in liaison with other hospitals and associations such as the Pakistan Pediatric Association. The journey that started with a single room has now taken shape as a well-established Children's Cancer Unit with nearly all its facilities under one roof. Still, we have a long way to go to make this unit a center of excellence not only for treatment but also for cancer research, including the development of a program of relevant clinical trials in Pakistan.

RESOURCES AT CCH

Total Inpatient Beds	14
Total Daycare Beds	8
Pediatric Oncologist	1
Pediatrician	3
Resident doctors	5
Oncology Nurses and technicians	11
Nutritionist	1
Social worker	1
Pathologist	1

Laboratory - Routine services

Hematology
Microbiology
Biochemistry

Radiology - Routine services

Plain X-rays

Pharmacy

* For Blood Bank, flow cytometry and CT/MRI and other expensive tests, we contract with other hospitals.

* A radiotherapy facility is available at a nearby hospital.

PATIENTS IN 2004-05

Total OPD visits	6,554
Total Daycare visits	4,016
Average daily inpatient occupancy	11
Total new referrals	277
Total new cancer	218



Physicians obtaining a sample of bone marrow from a patient.

THE FUTURE VISION

Our goals are to:

- Establish a 50-bedded unit within a new children's hospital with all necessary facilities for childhood cancer treatment and research, including palliative care services
- Undertake national and international clinical trials
- Provide training for doctors and nurses in pediatric cancer
- Establish a childhood cancer registry
- Develop shared care with similar facilities, to improve access and follow-up.

INCTR AND CCF

The organization of the first International Pediatric Oncology Conference in Pakistan in July 2005, in collaboration with INCTR, has been a wonderful experience for us. Although the formation of the Pakistan Society of Pediatric Oncology is one of the remarkable events of this meeting, the stronger and better relationship with INCTR is the far more important achievement. This partnership will go a long way in helping us to collaborate with INCTR in future projects. Through INCTR we are making new friends and benefiting from the learning experience of medical professionals at other centers. ■

M. Shamvil Ashraf, Children Cancer Hospital, Karachi, Pakistan

NETWORK

PROFILES IN CANCER MEDICINE

CANCER MEDICINE IN VIETNAM

Thirty years ago, there were only two cancer centers in all of Vietnam, a long and narrow country of over 2000 kilometers of seashore: one in the north — in Hanoi — and the other in the south — in Ho Chi Minh City (formerly Saigon). In the years following the reunification of North and South Vietnam, cancer medicine, as a specialty, has been slow to emerge. Nevertheless, in the last years of the 20th century, other cancer treatment units in some urbanized cities were created — Can Tho included. Dr. Huynh Quyet Thang, chief of the oncology department at Can Tho General Hospital, has been at the forefront of that evolution.

Can Tho is the third largest city in Vietnam, in the heart of the Mekong Delta, in the southwest and about 170 km away from Ho Chi Minh City.

The city is home to a bustling floating market, a large university, and lush groves and gardens. In this beautiful environment, the prevalence of cancer is increasing, as is the need for modern medical facilities, better equipment and qualified medical professionals. In the Mekong Delta, with a population of less than 20 million, Dr. Thang estimates that 20,000 new cancer cases are diagnosed every year.

Dr. Thang began his study of medicine in 1966 and completed postgraduate training in surgical oncology in France in the early 1990s. "Traditionally a great number of parents encourage their children to go into medicine," Dr. Thang says. "I very much liked medicine; it was during my residency rotations that my affinity for cancer medicine was revealed. The job gives me



Dr. Huynh Quyet Thang

great satisfaction."

Dr. Thang works strictly with adult cancer patients. His hospital, which is government-supported but not affiliated with Can Tho University, is the focus of a government initiative to create a new cancer center in Can Tho.

"Vietnam is a developing country climbing the socioeconomic ladder, and the longevity of our citizens is rising," Dr. Thang remarks. "During the war not many cancer patients were seeking treatment but, with the reunification, health care is becoming more important."

Vietnam has recently established a national cancer registry, along with a national program of cancer education and control. Cancer prevalence varies from region to region. In the north, lung cancer (in males) and breast cancer (in females) are the most prevalent. In the south, liver cancer (in males) and cervical cancer (in females) are most prevalent. In most rural regions, very few Vietnamese are even aware of cancer.

On some days, it seems to him that every cancer patient in the country

is at his hospital. With 43 beds in his department and 70-80 patients at any given time, the hospital halls are lined with cancer patients. His weekly routine incorporates surgical procedures, teaching responsibilities, consultations with young oncologists, and attending classes in medical English. Can Tho General Hospital, which lacks a radiation therapy unit and adequate medical imaging equipment, runs no clinical trials and enjoys no private sponsorship.

Despite these shortcomings, Dr. Thang hopes to develop his hospital's capacity to enhance the treatment of cancer patients. He maintains good relations with colleagues abroad, particularly those at the French hospital where he was trained. And he says he often "imposes" on the facilities and staff at Ho Chi Minh Hospital for help and support.

Dr. Thang routinely sends young doctors abroad for advanced education in oncology, and said his hospital recently sent ten nurses to Ho Chi Minh City for training. "In two or three years we'll have a staff that is professionally trained, and, hopefully, a new center for radiotherapy."

The most important challenge, he says, is funding. He is turning to a French humanitarian NGO for financial assistance, and looks to INCTR for guidance in creating a new cancer center.

"Given proper resources," he says, "there are many things we could do for our people — participate in national registry program, evaluate cancer in our city to create a strategy for a cancer control program, and send more doctors to be trained in foreign centers." ■

Marcia Landskroener for INCTR