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GUEST MESSAGE

EARLY DETECTION OF CANCER IN DEVELOPING COUNTRIES

by R. Sankaranarayanan ¹

Cancer is a generic term that refers to an aggregation (mass) of cells in a human organ that originated from the proliferation of a single cell that has escaped from normal growth control mechanisms (see Table 1 for a glossary of commonly used terms necessary to a general understanding of cancer). Cancer cells, also referred to as malignant cells, can develop from any tissue or organ in the human body. They result from changes in the genetic material in the cell of origin that may have occurred spontaneously or were induced by an agent (referred to as a carcinogen) that causes, or at least, predisposes, to cancer. Carcinogens include tobacco (however used), alcohol, certain viruses such as hepatitis B virus (HBV), human papillomaviruses (HPV), bacteria (e.g., helicobacter pylori), radiation, sunlight and certain chemicals. The mass of cancer cells (or malignant tumor) continues to multiply, resulting in enlargement of the origi-



Enumeration of women to be screened as part of a cervical cancer prevention program in Guinea.

nal (primary) tumor and the invasion and destruction of adjacent normal tissues. Cancerous cells from the primary site may also spread to distant organs or tissues, where they produce colonies of cancer cells called metastases. For example, a cancer in the breast (primary site) can invade the skin and chest wall muscles (local

spread) and/or can spread to the lymph nodes in the arm pit, or to the lungs, bones and brain (metastases).

All cancers, with the exception of skin cancers, invariably lead to death if not detected and treated properly. For nearly all cancers, treatment options and survival are related to the *stage* of the cancer, stage being a

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shorthand notation for the anatomic extent of disease. When cancers are diagnosed in early stages, i.e., when the extent is limited, high cure rates can be achieved by relatively simple, inexpensive therapy that is less toxic and ensures a high quality of life after treatment. More aggressive treatment that may entail more extensive surgery and/or radiotherapy and/or more intensive and more toxic systemic therapy (e.g., chemotherapy and hormonal therapy), is required when cancer is detected in moderately advanced stages when prospects of cure are more limited. Treatment of any kind is rarely effective in curing patients with very advanced cancer, particularly when it has spread to distant organs; almost all cancer patients with metastatic disease die within two years from



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Aggressiveness: The speed with which a cancer grows and spreads to adjacent and distant organs.

Carcinogen: An agent that causes cancer.

Cure: Complete and permanent elimination of the cancer from the body.

Diagnosis: The process of identifying and/or confirming disease in persons with symptoms or with a positive screening test.

Early cancer: Cancer diagnosed in stage 0 or stage I.

Invasion: The capacity of a cancer to infiltrate and destroy surrounding tissue.

Metastasis: A colony of cancerous cells in a location distant from the primary site of disease. Cancer cells can metastasize via the lymphatic system or blood stream. The term is not used for leukemias and lymphomas, which are often widespread from the onset of disease.

Neoplasm: General term for a tumor or "new growth"; benign tumors are not cancerous, while malignant tumors are.

Precancerous lesions: A situation in which cancer cells remain confined to a part of the organ in which they first arose and have not yet developed the capacity to invade adjacent tissues or spread to other parts of the body (stage 0).

Primary site: The organ in which the cancer initially developed.

Recurrence: The return of cancer after effective treatment – in the case of solid tumors, either in the primary location or as one or more metastases in other organs.

Remission: Partial or complete disappearance of a cancer after radiation or systemic treatment.

Response: A diminution in the size and extent of tumor following treatment. Response, corresponding to remission, can also be partial or complete.

Screening: Checking for early-stage cancer in apparently healthy people who have no symptoms.

Stage of cancer: A defined notation representing the size and spread of cancer in the body. Stage 0 is precancerous lesion, stage I corresponds to early cancer, stages II and III, moderately advanced and stage IV, metastatic cancer.

Staging of cancer: Investigative procedures directed towards evaluating the stage of cancer.

Survival rate: The percentage of cancer patients who survive for a given time period after diagnosis (e.g., the five-year survival rate is the percentage of people who survive five years).

Table 1. Commonly used terms relating to cancer.

diagnosis (exceptions include testicular cancer, placental tumors, and some leukemias and lymphomas). The early detection of cancer followed by prompt treatment, therefore, represents an important means

of improving survival rates as well as decreasing the cost and toxicity of required treatment and lessening the risk of late treatment complications (including second malignancies). Early detection is particularly

important in developing countries where, at the present time, up to 80% of cancers are diagnosed in advanced stages and less than 50% of patients survive for more than five years. The most common cancers in developing countries are cancers of the lung, stomach, liver, breast, uterine cervix (neck of the womb), head and neck, oesophagus, large bowel, urinary bladder and lymphoma and leukemia, which together account for four-fifths of all cancers. Of these, early detection and appropriate treatment is currently feasible for the control of cancers of the breast, uterine cervix, head and neck, large bowel and urinary bladder.

CANCER CONTROL

Cancer control, as discussed in previous issues of *Network*, refers to all actions taken to prevent or reduce the occurrence of cancer, the morbidity or suffering from cancer, and cancer-related deaths. These actions include preventing exposure to carcinogens, often referred to as primary prevention, the early detection of cancer followed by prompt and efficient treatment, and the control of symptoms from cancer, including the pain and suffering caused by very advanced cancer (palliative care). Due to massive investments in cancer control activities in the last few decades, cancer deaths have declined in the more developed countries of Europe, North America and Australia, particularly in the last ten years. On the other hand, there has been an increase in cancer deaths in many developing countries, due to the increasing cancer burden in these countries coupled to a paucity of planned cancer control actions. Recently, the World Health Organization (WHO) strongly recom-

mended that each country develops and implements a comprehensive national cancer control program (NCCP), to reduce the suffering from cancer and improve quality of life, as an important element of its overall public health initiatives.

EARLY DETECTION OF CANCER

Most cancers could be detected earlier if the index of suspicion of cancer on the part of primary health care workers were higher, particularly when providing care for persons known to be at high risk for cancer (because of exposure to carcinogens or a strong family history). Symptoms and signs that may give an early warning of cancer, however,

should also trigger an informed and empowered individual to seek medical care. The early warning signs of cancer are listed in Table 2. Some of these are general changes that do not help pinpoint any particular cancer. Nevertheless, their presence can lead to physical examinations and laboratory tests necessary to exclude or confirm the diagnosis and they should not be ignored. Fortunately, most of these symptoms are usually caused by far less serious conditions. Other symptoms such as a lump in the breast or a red patch in the mouth or bleeding after sexual intercourse are much more specific and help doctors to detect a particular kind of cancer.

A sore or ulcer that does not heal:	Ulcers that not do not get better or are increasing in size, becoming more painful, or starting to bleed.
Change in bowel or bladder habits:	Changes in frequency; changes in the color, consistency (diarrhoea or constipation), size or shape of stools; blood in urine or stools.
Unusual bleeding or discharge:	Blood in urine or stools; a discharge (particularly if blood stained) from any part of the body, e.g., nipples, penis, vagina; bleeding after sexual intercourse, intermenstrual bleeding.
Thickening or lump in breast or elsewhere:	Any lump in the breast or scrotum detected by self examination or a lump detected elsewhere in the body.
Indigestion or difficulty in swallowing:	A feeling of pressure in the throat or chest which make swallowing uncomfortable; feeling full without food or after eating only a small amount of food.
Obvious change in a wart or mole:	Asymmetry: Does the mole look the same in all parts or are there differences? Are the borders sharp or ragged? What color or colors is the mole? Is the mole bigger than 6 mm and/or increasing in size?
Nagging cough or hoarseness:	A change in the voice; a cough that does not go away; sputum containing blood.
A white or red patch in the mouth:	Lasts for more than four weeks; cannot be rubbed off.

Table 2. Warning symptoms and signs of cancer.

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The early detection of a small number of cancers (e.g. uterine cervix, breast, large bowel and oral cavity) can be achieved by screening persons with no symptoms. Such programs may be *opportunistic* i.e., members of the public must seek appropriate tests (which requires, of course, knowledge of their existence) or are offered them only if and when they access the health system for another reason. Alternatively, programs may involve *recruitment* i.e., the establishment of a program in which there is a systematic and organized effort to invite and test specifically targeted persons (e.g., of appropriate age and sex) in a particular geographical region for the possible presence of the cancer being screened for. Screening programs for cervical, breast and large bowel cancer have been in place in the more developed countries since the 1970s, or in some cases even earlier. Women aged 30-60 years, for example, are screened by Pap test for cervical cancer every 3-5 years, which has resulted in an 80% reduction in deaths from cervical cancer. Screening tests are not usually definitive and a positive test only indicates a high probability of having the disease. A positive result should normally be confirmed or disproved with further diagnostic tests (although when treatment is very simple and non-toxic, as in premalignant cervical cancer, treating all screen-positive patients is a strategy adopted in some programs to avoid the problem of patients failing to report subsequently for treatment).

Although screening tests can help to save lives, they can be costly and sometimes have unnec-

essary psychological or physical repercussions. One reason for this is that screening tests, particularly if not carried out properly, can give false-positive or false-negative results. False-positive results suggest a cancer is present when it is not, leading to other tests that may be expensive, time-consuming and sometimes risky. False-negative results show no hint of a cancer that is present, leading to a false sense of security. For these reasons, there are only a small number of screening tests that are considered reliable enough for routine use. Even then, a significant proportion of premalignant lesions detected may not progress to cancer in the patient's lifetime, but the risk is such that all such lesions must be treated so that some patients receive unnecessary therapy. Such therapy can vary from a minor, essentially risk-free procedure (e.g., in cervical cancer), to significant surgery and/or radiation (e.g., in breast cancer). All of these issues, in addition to the risk of developing the cancer in question, must be weighed in the balance in the context of available and required additional resources in assessing the potential health benefits and cost of screening appropriate target populations.

The awareness of the general public about common cancers, their causative factors, the value of early detection, the possibility of screening and the location of health service facilities where screening or early diagnosis is available is critical to the success of early detection programs; unfortunately, a fraction of screen-positive patients, particularly in the poorer countries, refuse therapy because

of issues of cost, stigma or fear. It is also essential that health care providers are appropriately educated about early detection, and that a sufficient number of adequately trained and skilled health professionals, along with the necessary equipment, supplies and facilities for early detection, diagnosis, treatment and follow-up, are available. It cannot be emphasized enough that early detection is of no value unless followed by effective treatment. Confirmation that cancer is present requires diagnostic tests such as visualization by endoscopy, or imaging by various techniques such as special X-rays (e.g., mammography), ultrasonography, computerized tomographic (CT) scans or magnetic resonance imaging (MRI). Sometimes biochemical tests (e.g., on blood) are valuable diagnostic aids which may also be used for assessing the effect of treatment. Unfortunately, many of these procedures are not always available in developing countries, or are out of the range of the patient's ability to pay. Ultimately, the examination under the microscope by a trained pathologist of cells or tissue from the suspected lesion (obtained by needle or surgical operation) is required to confirm the diagnosis. Staging studies, using tests similar to those required for diagnosis, will then be required to predict prognosis and determine appropriate therapy.

STAGE OF DISEASE AND IMPORTANCE TO THERAPY

In addition to imaging studies, biopsies are often needed for staging and can sometimes be done at the time of the initial surgical treatment of a cancer. For example, dur-

ing the removal of a cancer (such as breast cancer or colon cancer), nearby lymph nodes (in the armpit in the case of breast cancer) are removed so that they can be examined by a pathologist to see whether they contain cancer – indicating spread from the primary site. The information from the staging procedures permits the assignment of a disease stage, and this, along with the pathological features of the primary tumor, is used to decide on the most appropriate treatment for the patient. Disease stage influences whether a particular treatment modality is indicated, as well as the extent of a surgical operation, the anatomical regions to be radiated and the details of systemic therapy. When staging is based only on initial biopsy results, physical examination and imaging, the stage is referred to as *clinical*. When the results of a surgical procedure and additional biopsies (e.g., of regional lymph nodes) are used to determine stage, the stage is referred to as *pathologic*.

Stage 0 cancer is the designation used for precancerous lesions (e.g. carcinoma in-situ of the breast, cervical intraepithelial neoplasia grade III or adenocarcinoma in-situ of the cervix), whereas a stage I cancer denotes a small localized tumor, generally measuring less than 2 centimeters in its maximum dimension with no spread elsewhere. Stage 0 and I cancers are considered to be early-stage cancers. Limited local spread to surrounding tissues, generally measuring 2 to 4 centimeters in maximum dimension and/or limited spread to regional lymph nodes indicate stage II cancer. Stage III cancers are those with more extensive local spread measuring over 4 cen-

timeters or more extensive regional lymph node spread. Stages II and III are considered moderately advanced cancers. Stage IV cancers are those which have already spread to distant organs by metastasis at the time of diagnosis and are considered very advanced cancers. The cure rates for stage 0 cancers are generally 100% and often exceed 90% for stage I disease. Cure rates for patients with stage II cancer range from 40% to 60% and for stage III cancers, between 10% to 30% with optimal therapy (which, unfortunately, is not always available in developing countries). Patients with stage IV cancers are seldom curable.

SCREENING FOR EARLY CANCER IN DEVELOPING COUNTRIES

Screening for specific cancers in appropriate populations (based

on age, sex and, in some cases, exposure to known carcinogens) is much more difficult in developing countries because of the limitations of resources and the lack of knowledge among the general public. National cancer control committees should decide which, if any, cancers to screen for, which techniques will be used, and whether screening will be opportunistic or via recruitment. The latter is more likely to be successful in poorer, less educated populations, and may include the use of mobile clinics, particularly useful in rural, “hard-to-reach” areas, coupled to notification of the community of the visit date(s). The highest priority cancers for screening in developing countries – because of the availability of feasible methodologies coupled to the relative numerical

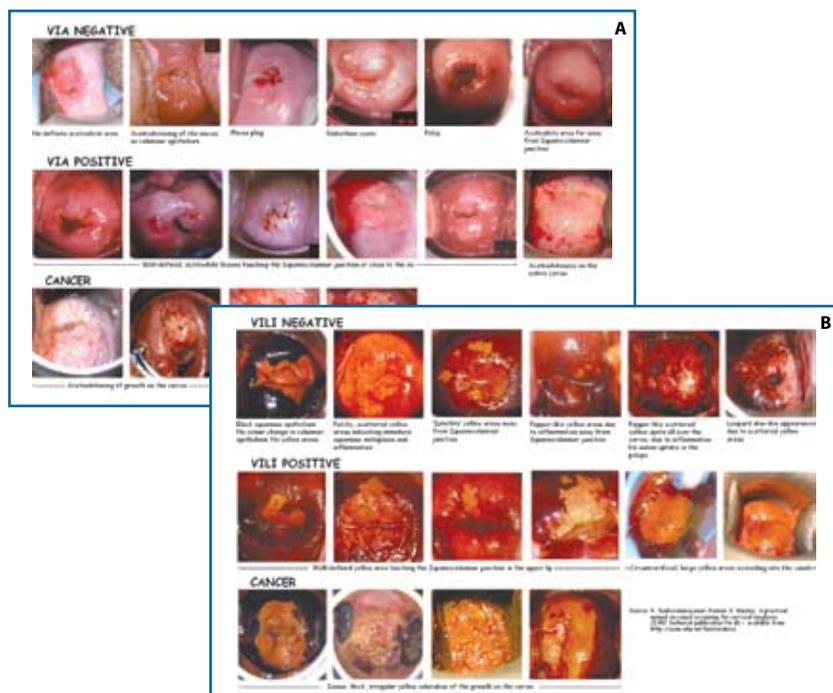


Figure 1. Charts showing the uterine cervix as seen on visual inspection after application of A: acetic acid and B: Lugol's iodine (available from <http://screening.iarc.fr/viavii.php>).

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Figure 2. Theory/practical lesson on loop electrosurgical excision procedure (LEEP), a treatment procedure for the removal of diseased cervical tissue, in Thailand.

importance of the cancer or the presence of a readily identifiable high-risk population - are cervical, breast, oral and bowel cancers.

CANCER OF THE UTERINE CERVIX

More than 80% of the cervical cancers in developing countries are diagnosed in stages II or higher, with overall cure rates less than 40%. Cervical precancerous lesions (stage 0 disease) can be easily diagnosed by screening tests several years before they manifest as invasive cervical cancers with symptoms. The Pap test, which relies on examining a smear of cervical cells under the microscope for the presence of cancer cells, the detection of the cancer-causing human papillomavirus (HPV) and visual inspection after the application of 3-5% dilute acetic acid (vinegar), a technique known as VIA (Figure 1A) or 3-5% iodine solution (Lugol's iodine), referred to as VILI (Figure 1B), are effective screening tests that can detect readily curable stage 0 and stage I cervical cancers. HPV testing is expensive at the moment, though cheaper and rapid HPV tests will be available in the near future. Visual screening

can be provided by doctors, nurses and health workers throughout the developing world as results are immediate and a laboratory infrastructure (and in the case of Pap smears, trained cytopathologists) is not required for confirmation, although women who test positive with these or any other screening test can be investigated by magnified inspection of the cervix using a colposcope and pathological examination of a cervical biopsy specimen to confirm disease. In good hands, visual inspection is as sensitive as Pap screening (although less expensive) in populations in developing countries, although the rate of false-positive tests tends to be somewhat higher. Women with stage 0 cervical cancer can be treated with simple, safe and effective day care treatments, such as freezing the cervix for a few minutes (cryotherapy) or by loop electrosurgical excision of the disease-containing cervical tissue (Figure 2). A recent large study in India showed that one round of screening with VIA among 49,000 women reduced cervical cancer deaths by 35% as compared to a group of women who did not have screening. Another study in South Africa showed that treating HPV or VIA screen-positive women with cryotherapy reduced the frequency of future stage 0 cervical cancer by 75% and 35%, respectively - i.e., effectively preventing cervical cancer - a benefit that would equally apply to women with false positives if treated without confirmation of the diagnosis. It is strongly advised that women in the 30-50 years age-group are tested at least once with any of the above tests or preferably once every five or ten years to

reduce their risk of death from cervical cancer. Unfortunately, there is limited availability of screening programs in developing countries, particularly for poor women who tend to be at the highest risk for the development of cervical cancer.

BREAST CANCER

More than 70% of breast cancers in developing countries are diagnosed in stages III or IV. Consequently, cure rates are less than 50% in most developing countries. The tests that are useful in the early clinical diagnosis of breast cancer include mammography, clinical breast examination (CBE) and breast self examination (BSE). CBE refers to the physical examination provided by a health care provider to check for lumps and other abnormalities in the breast (Figure 3). BSE refers to a woman checking her own breasts at intervals in order to become aware of what is normal, such that a newly appearing lump or anything else that seems unusual will be rapidly apparent. Although most abnormalities will not be malignant, BSE can lead to the early diagnosis of breast cancer as long as changes in the breast are reported to a health care provider immediately. BSE is an option that women can begin in their 20s. Women in their 30s should, ideally,

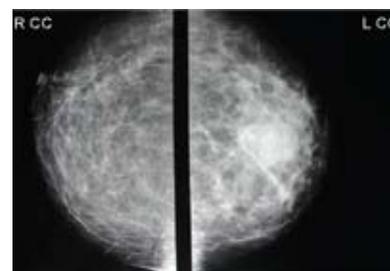


Figure 4. Mammography (x-ray images of right and left breasts).

have a CBE as part of routine health examination by a health professional every three years, and after age 40, every year, although this is rarely feasible in developing countries. Mammography produces an X-ray image of the breast (Figure 4) that is used to detect and evaluate breast abnormalities, both in women who have no breast complaints or symptoms and in women who have breast symptoms (such as a lump, pain or nipple discharge). Mammography produces a black and white image of the breast on a film (or as a digital image) which may help to detect early cancers that are too small to feel, as well as stage 0 breast cancers (known as *ductal carcinoma in-situ*). The ability of a mammogram to detect early breast cancer depends on the size of the tumor, the bulkiness and density of the breast and the expertise of the radiologist who reads the mammographic image. Mammography (Figure 4) is an expensive investigation and routine screening of all asymptomatic women using mammography is not an economically and logistically feasible option in many developing countries. On the other hand, a diagnostic mammography is valuable in further evaluating women in whom small lumps have been detected on CBE or BSE. As yet, however, no scientific studies have been performed that have provided evidence that CBE or BSE result in a reduced mortality from breast cancer in developing countries. Moreover, the availability, prompt implementation and quality of care are critical to reducing mortality rates in early stage breast cancer. Nonetheless, if a lump or other abnormality is found by either

mammography or breast examination, ultrasound examination may be used to guide needle aspiration of cells for further diagnosis. The term "triple diagnosis" is used when mammography, ultrasonography and fine needle aspiration cytology (FNAC) are used in combination in the diagnostic evaluation of women identified with lumps on CBE or BSE.

MOUTH CANCER

Oral cancer occurs in a location that is easily accessible to visual inspection by a health care provider, such that screening for visible oral pre-cancerous lesions, such as white patches (leukoplakia) (Figure 5A), oral submucous fibrosis (Figure 5B), red lesions (erythroplakia) (Figure 5C) and early oral cancer (Figure 5D) is inexpensive, accurate (with well-trained health providers) and eminently feasible even in the poorest countries. This test can be readily integrated into routine health care, since inspection of the oral cavity is often part of a routine physical examination. However, it is necessary to consciously look for the early signs of oral cancer when routinely performing a mouth examination if suspicious lesions are not to be missed. Screening examination can be made more efficient by inspecting persons at high-risk (users of tobacco or alcohol or both, aged 30 years and above), in whom more than 90% of all oral cancers occur. Careful visual inspection of the lips, cheek mucosa, the floor of the mouth, the tongue and the palate under bright light, and palpation of the neck will result in the detection of a large proportion of early oral cancers. A large study in India revealed

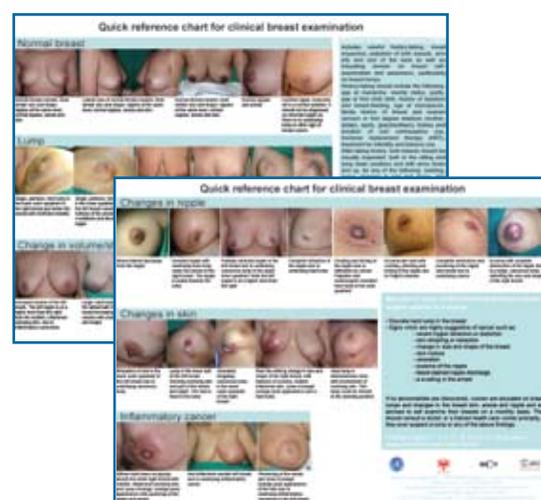


Figure 3. Charts showing findings on CBE examinations (available from <http://screening.iarc.fr/doc/breastchart.pdf>).

that visual screening of tobacco and/or alcohol users resulted in a 35% decline of deaths from oral cancer as compared to a group of unscreened people. Tobacco and alcohol consumers should be urged to give up these habits, particularly tobacco use, and submit to an oral visual screening every three years, since the risk of developing cancer remains high for some years after giving up.

LARGE BOWEL CANCER (COLORECTAL CANCER)

Large bowel cancer is emerging as an important problem in South East Asian countries and regions such as South Korea, Singapore, Thailand, Hong Kong and Taiwan, as well as in many Latin American countries, because of changing dietary habits. Most large bowel cancers begin as a polyp, which is a small, harmless growth in the large bowel wall, but which can evolve into a cancer. Tests used to screen for colorectal cancer include the following:

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Figure 5. A: Oral precancerous lesions such as white patches (leukoplakia). B: Oral submucous fibrosis (OSF). C: Erythroplakia (red lesions). D: Early oral cancer.

- *Fecal occult blood test*, in which the stool is checked for traces of blood;
- *Double contrast barium enema*, in which abnormal “filling defects” are detected by X-ray;
- *Flexible sigmoidoscopy*, which involves close visual inspection of the lower parts of the bowel by inserting a slender, flexible, hollow tube containing a light source and tiny video camera into the bowel and examining the images on a TV screen;
- *Colonoscopy*, which is similar to a flexible sigmoidoscopy, except that the entire large bowel is examined for signs of cancer or polyps.

A combination of these tests may be used in persons above 50 years of age for the early detection of large bowel cancers. In developing countries the inexpensive fecal occult blood test is likely to be the most feasible, although follow-up endoscopic examination

for screen-positive cases must be available for confirmation of the diagnosis and treatment.

ROUTINE CANCER-RELATED CHECK-UP

Periodic check-ups with health care providers offer the potential for health counseling, cancer screening and early clinical diagnosis. Screening tests can be performed, including examination of the head and neck, thyroid, breasts, testes, ovaries, lymph nodes and skin, or the patient can be referred for conventional cancer screening tests as appropriate by age and sex. At the same time, self-examination techniques and the early warning signs and symptoms of cancer can be taught. Health counseling may include guidance about stopping tobacco habits, advice on diet, physical activity, and shared decision-making about cancer screening. A periodic routine cancer-related clinic visit of this kind could lead to

the earlier detection of cancer and improve survival rates, even in the absence of treatment advances.

CONCLUSION

While prevention of cancer will always be the most attractive approach to cancer control, the next best option is early detection followed by prompt treatment. Governments and voluntary organizations have a major role to play in providing educational activities to inform and empower both the general public (which must be able to recognize early warning signs and be willing to seek early diagnostic services) and health care providers (who have a duty to provide counsel and to refer targeted persons for screening services). All of these elements are critical to success. However, effective cancer control by early detection and treatment also requires investment in infrastructure and human resources in developing countries. Unfortunately, in the poorest countries, the inadequate numbers and unequal distribution of trained doctors and nurses, as well as of cancer diagnostic and treatment facilities, make the provision of organized early detection services extremely difficult. Political will, planning and investments, accompanied by appropriate educational programs and advocacy for screening programs, are urgently needed if cancer control through early detection and treatment is to become a reality in developing countries. ■

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CHILDHOOD CANCER IN A DEVELOPING NATION: THE IMPACT OF A NATIONAL PROGRAM

Mexico is a country of 2 million square kilometers with a population, at the last census (2005), of 105 million inhabitants, 41% of whom are under 18 years of age. According to the last government report, 44.5 million Mexicans live below the poverty line, 14 million of whom are classified as extremely poor. The Mexican population includes 6,011,202 native Indians from various parts of Mexico, 720,000 of whom speak only their native dialect and cannot communicate in Spanish. Geopolitically, Mexico has 31 states and one federal district - Mexico City. Close to 50 million Mexicans are enrolled in socialized health care systems and close to 6 million have private medical insurance. In 2005, however, a total of 49 million people were reported by the federal government to have no health care plan.

More than half of the cases of cancer worldwide arise in developing nations¹. This imposes an enormous financial, social and health burden on countries whose available resources

are severely limited, a burden that will only increase since the number of cancer cases occurring each year (including childhood cancer) is increasing rapidly. Five percent of all cancer patients in Mexicans (compared to less than one percent in high-income countries) are under the age of 18 years. The incidence of childhood cancer (0-15 years) in Mexico is 122 cases per million per year, which is similar to that observed in developed nations; it is clear that the pattern of childhood cancer has become more like that of more developed nations – due, no doubt, to other improvements in child health. For example, several analyses conducted by federal public health authorities have indicated that overall childhood mortality has diminished in Mexico. This has resulted from various interventions undertaken at a national level, including a) The National Program of Immunization for children under 6 years old; b) The National Program for Oral Hydration for infantile diarrhea; c) The early diagnosis and treatment of pneumonias at federal institutions and; d) The early medical care of high-risk pregnancies and, therefore, of high-risk newborns. All

of these programs influence medical conditions that occur primarily in children under 3 years old. Nonetheless, the overall reduction in infant mortality has resulted in a larger pediatric population at all ages, and the burden of childhood cancer has correspondingly increased. Consequently, at the present time, the second leading cause of death in Mexican children between 4 to 15 years of age is cancer². Mortality from cancer is increasing, probably due to a limited number of tertiary care medical institutions and limited human resources. Presently there are only 111 Mexican board-certified pediatric hem/oncologists nationwide. Moreover, the distribution of specialists is uneven, and there are seven states that have neither medical institutions nor trained health professionals able to provide adequate treatment for childhood cancer.

NATIONAL COUNCIL FOR THE PREVENTION AND TREATMENT OF CHILDHOOD CANCER (NCPTCC)

The NCPTCC program, primarily dedicated to the provision of high-quality treatment free of charge to uninsured Mexican children with cancer, was officially established in January 2005³, although during the preceding year all of the major health institutions dedicated to the treatment of childhood cancer participated in the development of treatment regimens for the ten most common childhood malignancies in Mexico. Additional objectives of the NCPTCC are to finance nationwide clinical research projects, including translational research (i.e., from “bench to bedside”) and to promote and expand pediatric oncology training programs.

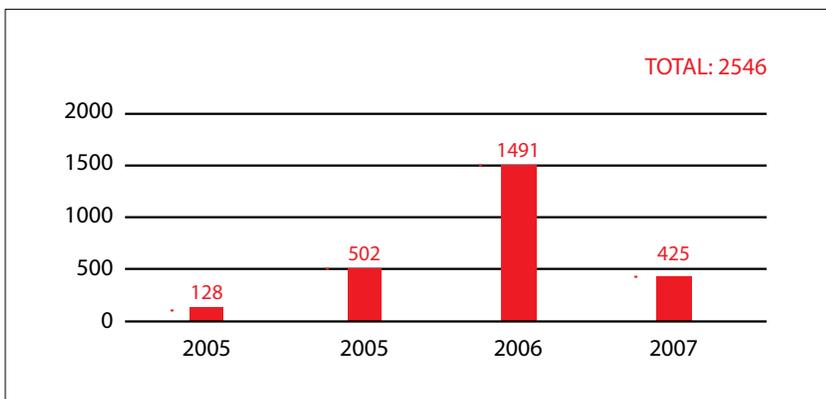


Figure 1. Pediatric patients registered in the National Program from January 2005 to June 2007.

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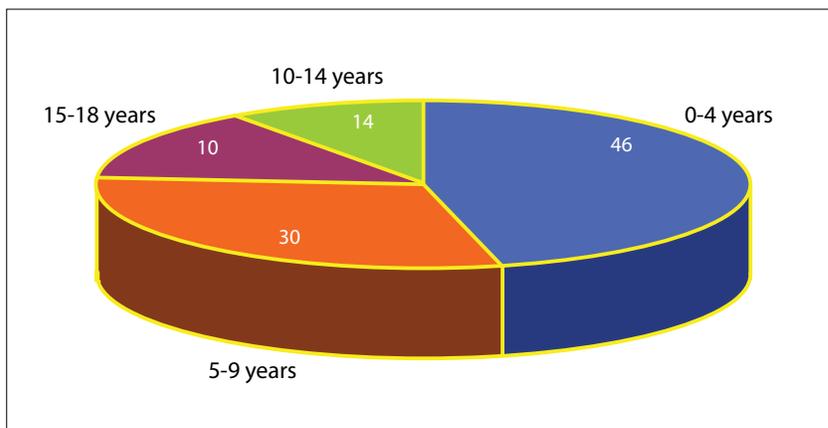


Figure 2. Age distribution in 2546 children with cancer registered in the National Program (2005-2007).

Federal funding initiated in 2005 has already led to the accreditation of 36 tertiary care medical institutions in Mexico and the development of a referral system for those states that do not have medical facilities able to manage childhood cancer. A total of 60 pediatric hematologists/oncologists are working in the program throughout the country and new pediatric residency programs in childhood cancer have also been established. The first disease to be

addressed, being the most common childhood cancer, was acute lymphoblastic leukemia. In January 2006, acute myeloid leukemia and solid tumors were included. All children included in the program are centrally registered online at the Mexico City Headquarters.

Three national meetings are held each year in order to improve the treatment regimens. By 2007, standard treatment regimens for all childhood cancers were established and, in 2008, clinical research protocols will be initiated in order to try to improve results. Currently there is a national coordinator and a committee for each type of cancer and its treatment. These working groups are kept informed of the treatment results, including toxicity, for the disease they are responsible for. Since the federal government is trying to use available funding with maximal efficiency, generic antineoplastic drugs whose quality conforms to international standards are used with results to date being comparable to those obtained with brand-name medications. The financial saving accomplished through the use of generic drugs (which includes all

available anti-cancer agents not still on patent), is in the range of 60%. Between January 2005 to June 2007, a total of 2546 patients have been accrued (Figure 1). Remarkably, only 3% of registered patients have been lost to follow-up. This compares to a rate of treatment abandonment of 24% prior to the initiation of the program. Almost half the patients (46%) are between 0-4 years of age (Figure 2) and more than half (51%) have leukemia or lymphoma (Figure 3).

In conclusion, this national program, if current progress can be continued, will eventually include all uninsured children with cancer throughout Mexico. It will also lead to improvements in patient care and promote clinical research through the creation of a cooperative group. A national group of this kind will be of great value in developing treatment strategies that lead to optimal patient care in the context of limited financial resources⁴. ■

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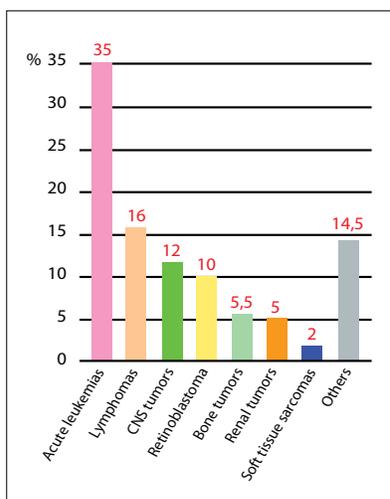


Figure 3. Cancer type prevalence in 2546 children from the National Program (2005-2007).

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ACCESSING EVIDENCE FROM RESEARCH STUDIES CONDUCTED IN LOW- AND MIDDLE-INCOME DEVELOPING COUNTRIES

Resolution WHA58.22 presupposes the existence of an accessible evidence-base of relevant research that can be used to guide and inform effective cancer control plans, a sufficient cadre of scientifically trained health professionals and the necessary infrastructure and resources to evaluate their outcomes¹. Existing evidence, however, is largely derived from studies conducted in the high-income countries. Eight countries (USA, England, Germany, Netherlands, Japan, Switzerland, France and Italy) account for over 80% of the journals indexed on Medline 2007². While scientific research in high-income countries has provided a solid foundation upon which to build cancer control

Member states should...

collaborate with the Organization in developing and reinforcing comprehensive cancer control programmes tailored to the socioeconomic context, and aimed at reducing cancer incidence and mortality and improving the quality of life of cancer patients and their families, specifically through the systematic, stepwise and equitable implementation of evidence-based strategies for prevention, early detection, diagnosis, treatment, rehabilitation and palliative care and to evaluate the impact of implementing such programmes.

World Health Assembly Resolution WHA58.22: Cancer Prevention and Control¹

measures, its context is very different from that of developing countries. Translational research, for example, is tailored almost exclusively to the needs of high-income countries. High-, middle- and low-income countries differ widely with respect to the types and patterns of cancer, levels of cancer incidence, patient genetics, health care services, socioeconomic status, literacy rates and behavior of populations as well as with respect to the resources they can command (human, physical and financial). Hence, cutting-edge research may offer little practi-

cal benefit to clinicians who practice in a context of limited institutional resources and a poor, less-educated population; although there are exceptions to this rule e.g. the development of vaccines.

In light of the remarkably different context in which cancer control must be practiced in developing countries, WHA resolution WHA58.22 also requested that the Director-General of WHO *should promote and support research that evaluates low-cost interventions that are affordable and sustainable in low-income countries*¹.

Search Category	J Egypt Nat Cancer Institute 2000-2007	NCI Cairo Yearbooks 2000-2006	Dissertations, Unpublished studies	Medline	Embase	Scopus	PsycLit	Published studies not indexed
Breast cancer (290)	44	64	24	80	88	172	94	33
Bladder cancer (319)	28	45	5	111	100	232	105	27
Lymphoma (134)	29	39	15	51	41	56	30	24
Paediatric malignancies (99)	25	34	10	27	11	13	43	20
Palliative care (100)	14	59	23	20	5	36	16	25
Total studies	140	241	77	289	245	509	288	129

Table 1. Studies in the indicated categories identified by searches of J Egypt Nat Cancer Inst (2000-2007), NCI Cairo yearbooks (2000-2006) and the Medline, Embase, Scopus and PsycLit databases.

NETWORK

Published studies	Indexed on all 4 databases	Indexed on 3 databases	Indexed on 2 databases	Indexed on 1 database only	Published studies not indexed on databases	Non-indexed studies published in J Egypt Nat Cancer Inst 2000-2007	Non-indexed published studies cited in NCI Cairo yearbook 2000-2006
Breast cancer (266)	25	41	45	121	33	19	25
Bladder cancer (314)	42	49	37	159	27	16	20
Lymphoma (119)	12	11	25	47	24	17	15
Paediatric malignancies (89)	1	4	14	50	20	14	12
Palliative Care (77)	1	5	11	36	25	11	23
Total studies (865)	81	110	132	413	129	77	95

Table 2. Access to studies according to the number of databases searched.

Reports of studies conducted in low- or middle-income countries, however, are not only few in number, but are significantly harder to access, since they are often not published in journals indexed by the major databases. Whereas research papers published by authors living in the USA or UK accounted for 32% of the cancer research indexed on PubMed in 2006, papers from the whole of Africa accounted for only 0.5% of the indexed cancer articles³. The task of gathering and assessing the value of non-indexed research evidence is, therefore, much more difficult.

A pilot study designed to assess the magnitude of these difficulties is being jointly undertaken by INCTR, the European School of Oncology (ESO) and the National Cancer Institute, Cairo. Preliminary results are presented here. The initial study entailed conducting a search of the *Journal of*

*the Egyptian National Cancer Institute (2000-2007)*⁴ and the *Yearbooks of the National Cancer Institute, Cairo (2000-2006)*⁴ for published reports of original research in breast cancer, bladder cancer, lymphoma, paediatric cancer and palliative care conducted in Egypt in the years 2000-2007 inclusive. The results were compared with electronic searches of four databases (Medline, Embase, Scopus and PsycLit) using search terms associated with the type of cancer or palliative care in the title, abstract or medical subject heading (MeSH) combined with 'Egypt' or 'Egyptian' in the title, abstract, address or affiliation details. Animal studies were excluded. Searches were conducted between January and April 2008 and the results downloaded into a bibliographic database (ProCite 5.1).

Of 1356 studies identified, 942 met the inclusion criteria. *J Egypt Nat Cancer Inst*

was indexed on Medline (2003-2007) and Scopus (2005-2006) but not on Embase or PsycLit. Searches of the *J Egypt Nat Cancer Inst 2000-2007* identified 140 studies, 70 (50%) of which were also cited in *NCI Cairo Yearbooks 2000-2006*. Searches of the *NCI Cairo Yearbooks 2000-2006* identified 241 citations, of which 77 (32%) were reports of dissertations or unpublished studies and 164 (68%) were reports of published studies. The 77 citations, dissertations or unpublished studies were excluded from the analysis, leaving 865 citations of published studies that met the inclusion criteria. The results of the searches are presented in Table 1.

Access to studies indexed on the four databases was variable. Of 865 published reports identified by the searches only 81 (9%) were indexed on all four databases (as determined by checking reports individually) and 129 (15%) were not indexed on any of the data-

bases. Of the 164 published studies cited in the Yearbooks of the National Cancer Institute, Cairo (2000-2006) and 140 included studies published in the *J Egypt Nat Cancer Inst*, 95 (58%) and 77 (55%) respectively, were not indexed on any of the four databases searched. The yield rate according to the number of databases searched are presented in Table 2.

From these results we can draw three conclusions: (1) coverage by indexing on the general medical databases is, at best, partial; (2) routine searching of one or even two databases is insufficient to adequately identify studies and (3) studies conducted in developing countries may be seriously under-represented on the major databases.

Less than 50% of the studies published in the *J Egypt Nat Cancer Inst* and *NCI Cairo Yearbooks* were included in the four major databases. This is partly because Medline has not yet indexed articles published in *J Egypt Nat Cancer Inst* prior to 2003 and partly because many of the articles cited in the *NCI Cairo Yearbooks* are published by journals not indexed by the databases.

Fifty years ago Aneurin Bevan observed: *many people have died and have suffered, not because knowledge was lacking, but because they did not have access to it. To all the suffering that attends illness there is the added bitterness that, if the poor could have had access to the knowledge available, they might have been saved or at least might have been helped*⁵. The continuing difficulties in both the creation of and access to evidence from research conducted and published in developing countries has five negative effects.

1. Reliance must continue to be largely upon the outcomes of studies conducted in the high-income developed countries, which may not always be relevant.
2. The barriers to dissemination of

information derived in an appropriate context may lead to delays in improving the care of patients.

3. Exclusion of data from developing countries in the major data bases infers that research conducted in developing countries is inferior to that conducted in the developed countries; although this may often be true, its value may be underestimated.

4. Because research conducted in developing countries is only partly visible, the evidence-base appears smaller than it actually is. National research profiles are minimized and motivation to invest in, and conduct, research is lessened.

5. The preparation and maintenance of context-relevant systematic reviews of effects and effectiveness of health care interventions and of the quality assessment of research methodology is hindered.

This pilot study suggests that the development of a comprehensive Internet-based **Database of Cancer Control in Developing Countries** could help to ensure that the outcomes of research studies relevant to populations in the low- and middle-income countries are made more easily accessible to decision-makers and could contribute to the development of evidence-based national cancer plans. Increased exposure to critical review should encourage higher standards in research methodology. INCTR, ESO and the National Cancer Institute, Cairo plan to continue to develop the Egyptian database in selected areas of cancer control, and subsequently to train appropriately qualified individuals in the conduct of systematic review. The database, which will be maintained by stakeholders within the region, should:

1. Raise the international profile of research conducted in Egypt.

2. Provide an accessible, comprehensive and relevant evidence-base that will lead to improvements in clinical practice.

3. Identify gaps in the evidence base, thereby stimulating and guiding the conduct of additional, nationally relevant research.

4. Contribute to improving the standard of published research by facilitating comprehensive systematic reviews of methodological quality.

5. Help prevent possible duplication of research effort.

The emphasis in Resolution WHA58.22 on evidence-based strategies is well placed, but there is a paucity of evidence created in the context of low- and middle-income countries. We hope that building the **Database for Cancer Control in Developing Countries** - piloted in Egypt, then expanded in a stepwise process - coupled with training in systematic review, will help lay the foundation for both improved public health interventions and patient care while simultaneously encouraging the development of a culture of scientific research in low- and middle-income countries. ■

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NETWORK

ADVANCED BREAST CANCER IN YAOUNDE, CAMEROON: A CASE REPORT

The patient, a 26-year-old single woman living with her parents while studying law at the University of Yaoundé, discovered a nodule in



Extent of disease prior to mastectomy.

the left breast in July 2005 through self-palpation. Initially, no action was taken. In February 2006, she developed mastodynia (pain in the breast) which led to a consultation at the Jamot Hospital. It was noted that her grandmother had developed breast cancer after the age of 50 years. Menarche was at age 15. She had taken oral contraceptives (Stediril) for a total of five months and had had one previous elective abortion. Nodulectomy was performed at Jamot Hospital and histology was read as a fibroadenoma. In May of the same year the patient was seen at the Obstetrics, Gynaecology and Pediatric Hospital of Yaoundé with a mass in the outer portion of the left breast, measuring approximately 8cm in size. A needle aspiration was performed, which showed the presence of carcinomatous cells. After a clinical, biological and

radiological assessment, the tumor was classified T4NXM0. At this time the patient was also found to be 14 weeks pregnant (single foetus). She was advised to undergo a therapeutic interruption of the pregnancy followed by neoadjuvant chemotherapy, but refused further therapy.

In July 2006, she was seen at the General Hospital of Yaoundé, where she was determined, by ultrasound examination, to be 21 weeks pregnant. She expressed a desire to preserve the pregnancy. Further assessment at this time included blood counts, liver and renal function tests, serum calcium, bone scintigraphy, mammography, breast and abdominal ultrasound, and a chest x-ray. On 26th July the staff of the cancer department advised her to undergo a therapeutic interruption of the pregnancy followed by neoadjuvant chemotherapy. However, the patient again declined to accept the advice since she did not wish to lose her child and made this clear in a letter of refusal on 17th August. She asked for a medical report and a referral abroad. On 16th September 2006, staff members accepted the patient's refusal to undergo therapeutic termination, and chemotherapy with doxorubicin and cyclophosphamide was initiated in the Medical Oncology Service of Yaoundé General Hospital. On 20th September 2006, after 28 weeks of pregnancy, the patient spontaneously delivered a live female infant weighing 1200 grams. The baby died the next day.

In October, an abdominal ultrasound examination showed suspicious hepatic nodules. Additional

cycles of the same chemotherapy were administered on 11th October and 13th November 2006. The patient was then referred to the Gynaecology Service for a mastectomy, but this was not performed because of the patient's apprehension and financial difficulties. Instead, she undertook a traditional medicine remedy comprising the application of clay to the diseased breast accompanied by night prayers.

On 29th December 2006 due to progression of the tumor the patient returned to Yaoundé General Hospital. Additional chemotherapy with docetaxel and doxorubicin was administered, the drugs being given free of charge by the National Cancer Control Committee (NCCC).

The patient failed to return for follow-up until June 2007, when mastectomy and radiotherapy were performed. Subsequently, however, she suffered a local recurrence in the form of a 7cm mass and was also found to have ascites. Palliative care was administered.

DISCUSSION

This case raises a number of issues, including the young age of the patient, the history of breast cancer in the grandmother, the role of hormone contraception in the causation of breast cancer and the management of cancer in a pregnant woman. Although the nodule that she discovered by self-palpation was removed, it is possible that it was not a fibroadenoma. When breast cancer was diagnosed, approximately 17 months later in the same breast, she initially refused therapy because she

CASE REPORT/FORUM

did not wish to have the pregnancy terminated, causing four months delay (May to September) in the initiation of treatment – unfortunately to no avail, since the child was born prematurely and died within a day. Her cancer progressed in spite of chemotherapy: hepatic metastases were suspected after only one course of treatment. She initially refused mastectomy and radiotherapy, at least in part because of significant financial difficulties, and opted for traditional medicine instead. In spite of the tragic circumstances, she was grateful for the assistance of the NCCC and the solidarity and collegial approach to medical decision making by the staff of the Cancer Department. Even in this intelligent young woman who practiced breast self-examination, her cancer was already advanced by the time she started therapy and financial issues were clearly a factor in her refusal of medical treatment in favor of traditional medicine. ■

*Paul Ndom,
Yaoundé General Hospital &
INCTR Cameroon,
Yaoundé, Cameroon*

**Readers are invited
to comment on the several
issues raised by this case
by letter or e mail
to INCTR. Selected letters
will be published
in the next edition.**

LALLA SALMA ASSOCIATION AGAINST CANCER



In less than three years since its founding, the Lalla Salma Association Against Cancer (ALSC) has mobilized efforts to raise public cancer awareness throughout Morocco, launched an ambitious building campaign, organized the first national cancer registry and linked arms with an array of international partners in the fight against cancer. Inspired by the vision and leadership of Her Royal Highness, Princess Lalla Salma, the non-governmental organization is already making significant inroads in improving the quality of cancer management and ensuring that all Moroccan patients have access to a high standard of cancer care. Early detection projects in breast and cervical cancer are underway, and the ALSC oversees a program of tobacco control partnership with

the Ministry of Health and business and education leaders.

The Lalla Salma Association Against Cancer aims to improve the quality of life of cancer patients by:

- supporting national policy for cancer control
- building and equipping oncology centers, family accommodations, hospitals and a pain and palliative care center
- focusing on information, prevention and early detection
- supporting patients and their families, and
- supporting medical staff, training and research.

Most NGOs in Morocco focus on one specific area of cancer control, mainly on women and children, notes Maria Bennani, international cooperation manager. "ALSC comes with a systemic and global strategy that follows WHO recommendations, regarding prevention, early detection, diagnosis, screening and palliative care. ALSC along with the Ministry of Health and other stakeholders are working to give an accurate analysis of cancer in Morocco



HRH Princess Lalla Salma greets a cancer patient.

NETWORK

and to develop the national cancer prevention and control plan.”

ALSC is developing a breast screening program for the Rabat-Sale region of Morocco. The purpose of phase I was to determine whether digital mammography and readings could be performed either onsite or at another location by electronic transmission of images via a secure website. In partnership with INCTR, in phase II, ALSC aims to screen as many women as feasible in the region. “It would be logical to develop an integrated approach to breast cancer control such that patients from specific screening centers are referred to specific hospitals for biopsy,” notes Bennani, “and biopsy-positive cases are referred to an appropriate center for treatment which, ideally, should be standardized. Both screening and treatment should be associated with outcome measures in order to determine whether the survival rate of breast cancer is improved in patients detected by screening.”

In addition to her role with ALSC, HRH Princess Lalla Salma serves as a Special Representative to the International Union Against Cancer UICC and is a Goodwill Ambassador with the World Health Organization for the promotion of prevention and cancer care. She is also an honored president of the Regional Alliance for Cancer Control and Prevention in the Eastern Mediterranean region, created in late November 2007 at Marrakech.

She considers the fight against cancer “a school of humility and a determination of collective solidarity. The fight against cancer must be given the urgency and the importance that it merits — and, now.” ■

Marcia Landskroener for INCTR

INCTR EXTRAORDINARY GENERAL ASSEMBLY

An Extraordinary General Assembly of Active Members was Held on 13th December to fulfil legal requirements for making minor changes to INCTR’s Statutes. ■

MEETING WITH CIRB

A meeting took place on January 10th with the Centre d’Informatique de la Région Bruxelloise (a component of the Health Ministry) to discuss a role for INCTR in the context of developing a program for breast cancer control in the Rabat-Salé region of Morocco. INCTR will assist in planning, particularly in relationship to the design of a data base. ■

ImpACT MEETING IN SRI LANKA

Drs Stuart Brown and Gayatri Palat, of INCTR’s PAX program (palliative care) participated in an ImpACT mission to Colombo organized by the Program of Action in Cancer Therapy (PACT) of the International Agency for Atomic Energy (IAEA) to provide recommendations to the government of Sri Lanka with respect to cancer control. ■

IAEA MEETING IN GENEVA

INCTR participated, at the invitation of IAEA PACT, in a meeting entitled: *Promoting Affordable Cancer Therapy for Everyone*, that took place on January 27th at the Palais des Nations. The purpose of the meeting was to inform members of Permanent Missions of the United Nations and other organizations based in Geneva about the importance of cancer control in developing countries and some of the obstacles that must be overcome. Dr. Magrath spoke on *Capacity*

Building: Strengthening Expertise and Preventing Brain Drain. ■

INCTR’S GOVERNING COUNCIL AND ANNUAL GENERAL MEETINGS

The Annual General Meeting and Governing Council meeting took place on 9th February. INCTR would like to thank Professor Harald zur Hausen, who, resigned from the Council after serving two terms of office, for his many efforts on behalf of INCTR. Dr. zur Hausen was elected as an active member. ■

FIRST MEETING OF OERC

INCTR has been asked to take a leading role in the establishment of a consortium to develop Open Educational Resources for Cancer, with a particular emphasis on developing countries. The first meeting of the core group, spearheaded by i-Bharthi Health, an NGO established by Raj Shah, Chairman and CEO of CTIS (and provider of INCTR’s web portal), took place in Leesburg, Virginia, USA on 17th February. The meeting was led by Anil Srivastava (President of i-Bharthi Health), Larry Lessin (project leader) and Raj Shah. ■

INCTR USA

On 18th February, Dr. Magrath visited the headquarters of INCTR USA in Philadelphia, and met with Dr. Richard Pestell, President INCTR USA and Helen Lane, who is devoting some of her time to fund raising for INCTR USA. ■

AMERICAN ASSOCIATION FOR CANCER RESEARCH (AACR)

On 19th and 20th February, Dr. Magrath attended AACR’s International Committee meeting,

and gave an overview of cancer control in developing countries. ■

MEETING IN MOROCCO ON BREAST CANCER CONTROL

From 17th to 19th February, Sabine Perrier-Bonnet, project officer for INCTR's French branch, Alliance Mondiale contre le Cancer, attended a meeting in Morocco on breast cancer control and signed, on behalf of INCTR, a Memorandum of Understanding with the Lalla Salma Association against Cancer (which organized the meeting) to work together in the development of the program in the Rabat-Salé region. ■

CONFERENCE IN KAMPALA IN HONOR OF DENIS BURKITT

INCTR participated in a Conference on Burkitt lymphoma held in Kampala from 25th to 28th February to celebrate the 50th anniversary of Denis Burkitt's description of the tumor that now bears his name. Ms. Adde presented the preliminary results of INCTR's project on the treatment of African Burkitt's lymphoma in three countries, and Dr. Magrath gave a summary of the evolution of the understanding of the biology and treatment of Burkitt lymphoma as presented at the meeting. ■

SYMPOSIUM ON PEDIATRIC PALLIATIVE CARE

Members of INCTR's PAX Program organized a symposium on Pediatric Palliative Care as part of the regional meeting of the International Society of Pediatric Oncology that took place in Muscat, Oman. The symposium, which was sponsored by NCI's Office of International Affairs, took place

on 25th February and included presentations on INCTR's programs in India and Nepal. ■

EUROPEAN SCHOOL OF ONCOLOGY (ESO) CONFERENCE IN MUMBAI

INCTR participated in a conference organized by ESO on *Leukemias; Molecular Insights into Treatment Paradigms* that took place on 7th - 9th March. INCTR was also represented on the scientific committee of the meeting which was considered part of the evolving relationship between INCTR and ESO. ■

SEMCO-ASCO CONFERENCE IN CAIRO

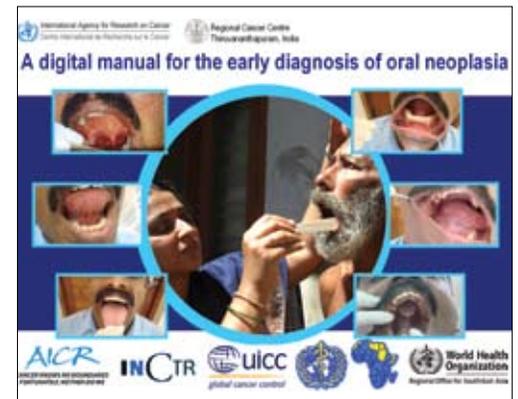
Mark Lodge and Professor Ama Rohatiner represented INCTR in a conference jointly organized by the South and East Mediterranean College of Oncology and the American Society of Clinical Oncology that took place in Cairo on 26th to 28th March. The theme of the conference was Cancer in the Older Population in the SEMCO region. ■

INCTR's 8th Meeting on Cancer in Countries with Limited Resources will take place in Antalya, Turkey, from March 22nd to 24th 2009.

**Further information is available from:
<http://www.inctr.org./meetings/index.shtml>**

DIGITAL MANUAL FOR THE EARLY DIAGNOSIS OF ORAL NEOPLASIA

Oral cancer is an important public health problem worldwide and is the number one cause of death from cancer among men in India.



Examination of the oral cavity should be an integral component of any thorough routine physical examination as it provides precious insight into a person's overall state of health. Unfortunately, it is often not the case.

The International Agency for Research on Cancer has produced a digital atlas, which contains over 400 color pictures for use by and training of medical practitioners, nurses, dentists and primary health care providers.

It is not intended to be either exhaustive or encyclopaedic. It focuses on facilitating early diagnosis of oral premalignant and early malignant lesions by familiarizing health care providers on commonly encountered oral lesions and their differential clinical diagnosis. Special attention is drawn to pitfalls in clinical diagnosis and interpretation.

The Manual is available on <http://screening.iarc.fr/atlasoral.php> ■

NETWORK

MNJ INSTITUTE OF ONCOLOGY'S PALLIATIVE CARE PROGRAM

The MNJ Institute of Oncology and Regional Cancer Center, Hyderabad, is the leading cancer facility in the Indian state of Andhra Pradesh (AP). It includes one of only a few palliative care facilities in all of India. Under strong and committed management over the past decade, MNJ has developed into a major can-



MNJ Institute of Oncology was founded in 1955 with donations from philanthropists, notably Mehdi Nawaz Jung Bahadur, after whom the hospital is named. The government of India designated the hospital as a regional cancer in 1996.

cer center serving a population of approximately 73 million in the state of AP and many people from four neighboring states.

MNJ Institute is the only center offering post-graduate training in radiation oncology in AP. With the addition of a second oncologist last year, MNJ Institute has developed an excellent pediatric oncology program that is working to improve survival rates in children with cancer. Now, through the efforts of Dr. M. R. Rajagopal (Dr. Raj) and his protégé Gayatri Palat, MNJ Institute is becoming a key player in the area of palliative care.

Trained as an anesthesiologist, Dr. Palat began her career with the World Health Organization in Calicut, where she met Dr. Rajagopal, a former pro-

fessor of anesthesiology who has pioneered palliative medicine in the country and who now heads Pallium India, a charitable trust established to work at the national level to bring pain relief and palliative care to the suffering millions in India. The senior physician had been instrumental in establishing palliative services in Kerala. MNJ Institute established its pain and palliative care department just five years ago.

Since 2000, Dr. Palat has focused exclusively on chronic pain management and palliative care. When Dr. Rajagopal and Pallium India began collaborating with the American Cancer Society and INCTR to initiate the Indian Palliative Care Network in June 2006, she was identified as program director and has since been appointed as the Director of PAX (INCTR's palliative care program) in India.

The goal of the joint initiative is to establish an ever increasing number of palliative care centers in India that can deliver care, train specialists, work with local government on issues such as drug availability, and provide community education and outreach. Over the past two years, MNJ Institute, Hyderabad in the south central part of India has become the regional training center for palliative care and training. The hospital offers four-week certification programs for palliative care specialists, and INCTR's PAX has visited the institute on several occasions to assist with training and sensitization programs. Dr. Palat and her team are working to develop a network of regional palliative care centers devoted to education, policy and advocacy. While there are palliative care services in southern India, there are very few facilities in the northern region and developing an

association with major centers in central and north India will be crucial to improving access to care throughout India. MNJ Institute is also conducting a poster program to raise public awareness about the importance of prevention and the early detection of cancer, as well as a tobacco program that targets the most important risk factor for cancer.

Dr. Palat notes that head and neck cancers have the highest incidence in this part of India, relating to the habit of chewing "pan." Unfortunately, by the time patients' receive medical help, two-thirds are in advanced stage and 80% need palliative care. The load is increasing every day. Yet palliative care is available to only 2% of those who need it.

The World Health Organization estimates that 2.5 million people in India are suffering from cancer, with another 2.7 million living with HIV and AIDS. The need is staggering. At MNJ Institute alone, a hospital with 280 beds, 10,000 new patients each year seek help.

"One of the great challenges is that cancer care is limited to the big cities," notes Dr. Palat. "Patients are reluctant to seek medical treatment so far from home - it's a formidable obstacle. Then there is the stigma of cancer, which interferes with treatment. And there are no provisions for patient support, which makes follow-up difficult."



Our team at MNJ.

PARTNER PROFILE

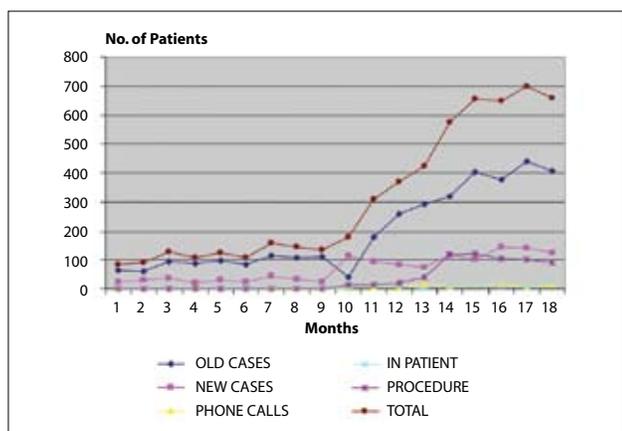


Figure 1. Patient Statistics for the period from January, 2006 to June, 2007.

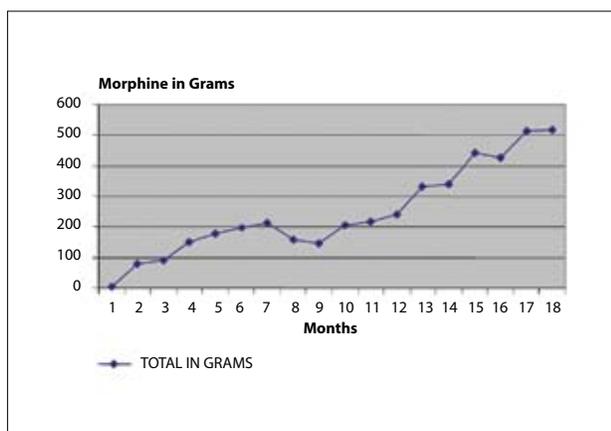


Figure 2. Morphine Consumption for the period from January, 2006 to June, 2007.

Another significant challenge is the availability of opioids. Dr. Palat and her team are working with the government to develop new policy affecting the availability and local manufacture of oral morphine.

“It is a misconception that opioids are to be used only at the end of life,” says Dr. Palat. “We’re in a country where opium is cultivated, but it’s not available for medical purposes because of the fear of misuse. In 1986, opioids simply disappeared from the pharmacies, so doctors are not trained to administer them. Yet across the country, opium is freely available on the street. One good thing we have discovered is that when you talk to the public, they come asking for it. And when the public pressure is there, the politicians will take note. So we put a lot of energy into public awareness.”

The state government of AP has recently introduced a state-sponsored medical insurance system for people below the poverty line that provides free medical treatment for major chronic diseases, including cancer. By the end of the year, the population of the entire state will be insured. Patients can go to any

hospital and get full medical treatment. At MNJ Institute, 90% of all hospital services are free. All outpatient treatment is free, and for those



Crowded waiting room at the palliative care clinic, MNJ.

who cannot afford it, all palliative medication is free.

“We have introduced palliative care as part of this insurance package,” notes Dr. Palat. “This is a major achievement that will help us improve the quality of cancer services.”

Dr. Palat also hopes to expand palliative care services for patients with HIV/AIDS. Andhra Pradesh is the second-leading state in India for incidence of HIV infection.

“The reality is that people diagnosed with HIV just disappear,” she says. They don’t come back until

they have symptoms.”

The palliative care team in MNJ tries to empower the families of the patients by educating family caregivers to deal with feeding, wound care, constipation and other complications that arise from the illness or its treatment. “In these instances, family caregivers are much better than the professionals because they do it with such love and dedication,” says Dr. Palat.

It is this grass-roots, home-care approach that will ultimately bring about a sea-change in expanding access to palliative care. “What we hope to do is develop a network of local palliative care centers that can become self-sustaining – centers providing family health care supported through local fundraising. If you are always looking for funds from outside sources to tackle big projects, you won’t achieve sustainability. We have to remember that palliative care is not like regular health care. This job goes beyond medicine to encompass advocacy, public awareness and family support.” ■

Marcia Landskroener for INCTR

NETWORK

PROFILE IN CANCER MEDICINE

A DELICATE BALANCE

Dr. Maha Arnaout is a classic over-achiever: intelligent, compassionate and driven to excel. Jordan's first female oncologist built a pediatric oncology department from nothing, devised a health education and public awareness communications strategy, and earned an MBA in marketing while putting in long hours at the hospital. She now has one of the most emotionally difficult, and rewarding, jobs imaginable. She directs the pediatric pain management, palliative care and the late effects programs at King Hussein Cancer Center in Amman.

Trained in pediatric medicine at University of Jordan, Arnaout completed post-doctoral training in pediatric hematology and oncology at St. Jude Children's Research Hospital in the United States. She returned to Jordan, where pediatric oncology facilities were limited and only 40-50% of pediatric patients survived. With her appointment to Al Amal Center (currently known as King Hussein Cancer Center), she became the first woman in Jordan to head an oncology department.

"I started with empty rooms—few nurses, limited medication availability, no facilities, just a building," she recalls. "I adopted international standards, using St. Jude protocols and adapting them to Jordan. With time, one patient became 30, and eventually we were seeing 250 patients a year. It's been a great challenge but I can proudly say it has worked. Pediatric



Dr. Maha Arnaout

patients now have an 80% survival rate. I'd like to think that I was part of making a difference."

In 2002, she also developed and directed the communications office to raise public awareness of both pediatric and adult cancers. That "tiny little voice" that often spurs her to new challenges this time was the cry of a child in pain.

In 2003 she launched a pediatric pain management program—the first in the region—which she now directs along with programs in palliative care, launched in 2005, and the late effects program.

"I really enjoy the act of building something and bringing it to the point when it's successful," she muses, "but I don't think I'll be moving on from palliative care and pain management. It's very rewarding to see the change in a child who one day is totally miserable and the next day is laughing and happy to see you. It's almost magic—

you can do this in a matter of hours. The more complex the pain issues, the more gratifying. It's a beautiful feeling to be able to do that for a child."

Even as she helps children recover, Dr. Arnaout is compelled to help those who are losing the battle. "As oncologists, once we get to the point that a child is not responding to treatment, we feel that we have failed and we tend to look at the patient differently. We forget this is a *child* who has a tumor that we have failed to treat. There are lots of people taking care of the child who will be cured, but not so many are taking care of the children who are dying."

It's an emotional strain, she admits. When a patient dies, it's a huge personal loss. "It's very difficult because I loved that child. These kids are amazing and so courageous. They understand what's going on and know what's going to happen, sometimes better than the parents."

For Dr. Arnaout, her work is a delicate balance. It's gratifying to make a difference to dying children and their families, but it comes at a high emotional toll. To ease the strain, she also takes care of children who have survived their ordeal with cancer. In the late effects program she launched three years ago, she works with children who have some residual effects of chemotherapy or disease, as well as those fully cured with no late effects. "To see a child smiling and happy and healthy, that's a wonderful feeling," she says. ■

Marcia Landskroener for INCTR