1991 CANCER COMMITTEE MEMBERS

James R. Barton, M.D., Otolaryngology
David J. Czarnecki, M.D., Radiology
Aileen E. Denny, M.D., Medical Oncology
William R. Deshur, M.D., Surgery
Ajit B. Divgi, M.D., Medical Oncology
John P. Hanson, Jr., M.D., Medical Oncology
Ronald D. Hart, M.D., Medical Oncology
Gary L. Kamer, M.D., Family Practice
Jonathan Kay, M.D., Anesthesiology
Elmer G. Lehman, M.D., Obstetrics & Gynecology
Howard J. Lewis, M.D., Radiation Oncology
Suresh K. Misra, M.D., Family Practice
Mary E. Ness, M.D., Physical Medicine & Rehabilitation
Julie O’Reilly, M.D., Obstetrics & Gynecology
Samuel J. Otto, M.D., Urology
Jorge G. Pellegrini, M.D., Pathology
Marcia J.S. Richards, M.D., Chairperson, Radiation Oncology
Terence V. Roth, M.D., Surgery
Paul J. Sienkiewicz, M.D., Orthopedics
Robert F. Taylor, M.D., Medical Oncology
Elaine M. Thomas, M.D., Pediatrics
Alfred Anderson, Data Registry
Kathy Bielinski, Cancer Registrar, Medical Records
Sandy Blixt, Cancer Registrar, Medical Records
Mike Farina, Pharmacist
Vicki George, Vice President
Lisa Green, Marketing
Frank Kalivoda, Vice President
Angela Klimaszewski, Cancer Research Coordinator
Grace McCutcheon, Social Services
Peg Ose, Manager, Vince Lombardi Cancer Clinic
Nancy Nowak, Director, Cancer Program
Kerry Twite, CNS, Cancer Program
Nancy Vogt, Supervisor, Medical Records
Phil Whitton, Manager, Radiation Oncology
TABLE OF CONTENTS

Introduction for Annual Report 1991 ............................................. 1
Epidemiology of Lung Cancer ......................................................... 2
Advances in Smoking Cessation .................................................... 3
Role of Family Physician ............................................................... 4
Traditional Treatment Approaches ................................................ 5
Thoracic Imaging for Lung Cancer .................................................. 6
Lung Function: Effect on Treatment Options ................................... 7
Surgical Treatment of Lung Cancer .................................................. 8
Chemotherapy Treatment and Research of Lung Cancer ................. 10
Radiation Treatment of Lung Cancer ............................................... 12
The School of Radiation Therapy Technology ................................. 14
Vince Lombardi Cancer Clinic Program Review ............................. 15
Familial Cancer: Getting the edge .................................................. 16
Prostate Screening Update ............................................................. 17
Ovarian Cancer Support Group ...................................................... 18
Children Coping with Cancer in the Family ................................... 19
Visiting Nurses Association Hospice .............................................. 20
Glossary ......................................................................................... 21
References ...................................................................................... 22

Annual Program Supplement

Cancer Registry Report

Presentations and Instructional Sessions

St. Luke’s Medical Center Cancer Conferences
The Cancer Committee continues to function as a multi-disciplinary committee overseeing and monitoring the Oncology Program of St. Luke's Medical Center. In that capacity, this year the committee has encouraged and supported continued head and neck cancer screenings, prostate cancer screenings, and skin cancer screenings. In addition, Rehabilitation Medicine has developed a cancer rehabilitation interest group with a resultant increase in their services to oncology patients. All 28 beds of the Oncology Unit were opened this past March.

Monitoring activities of the Cancer Committee included reporting of the short-term and long-term studies completed through the American College of Surgeons on ovarian, cervical and colorectal cancer. In-house studies on soft tissue sarcomas, prostate cancer, and multiple myeloma were performed and discussed.

Educational efforts for the medical staff included Security Savings and Loan Cancer Lectureship Series and public education forums on colon, breast, skin, ovarian, and cervical malignancies. Continued supportive association with the Vince Lombardi Golf Classic has facilitated research activities in the area of oncology, and provided resources for patient education, early detection, and prevention programs.

A new event, the Vince Lombardi Award of Excellence Dinner Ball, was held early in 1991 with the support of the Vince Lombardi Golf Classic. Once again, the Vince Lombardi Golf Classic was a success. Activities which were coordinated through the Vince Lombardi Cancer Clinic continued to grow. These activities included the Hotline, the Newsletter, and the Patient Education Series.

A new support group for patients with ovarian cancer was developed at St. Luke's Medical Center in 1991 in response to a need by the community. St. Luke's also continued its interaction and activity with the Cancer Society by co-sponsoring the American Cancer Society's Bike-a-thon.

The Department of Radiation Oncology experienced some growth and moved into a partial expansion mode in order to add a third linear accelerator for patient treatment.

Grants were made available through the Schroeder Chair to facilitate the start of new programs in oncology. With input from the Cancer Committee, Oncology Education programs were added to the educational TV programming made available to St. Luke's patients.

In August of 1991, Dr. Stephen Hazelrigg, from the Department of Cardiothoracic Surgery, directed a surgical lung cancer symposium.

For most of the year we functioned without a Director for the Cancer Program, but we were pleased to welcome Nancy A. Nowak to that position during the latter part of 1991.

Again, the Cancer Program at St. Luke's Medical Center exhibited growth in patient services with an increase in patient numbers, new programmatic development in the area of oncology, and continued cancer education of the medical staff and community.
According to Cancer Facts & Figures - 1991:

In 1987, for the first time in over forty years, more women died of lung cancer than breast cancer, which had, until that time, been the major cause of cancer death in women. The incidence rate had been increasing steadily in men and women for several decades but had begun to decline in men in the latter part of the 1980's. The incidence rate in women though has continued to increase. This trend appears to be reflected in the following Age/Sex distribution comparing patients diagnosed and treated for lung cancer here at St. Luke's Medical Center in 1986 and in 1991. In 1986, of the 160 lung cancer patients, 69.4% were male and 30.6% were female. In comparison, for the 177 lung cancer patients in 1991, only 55.1% were male and 44.9% were female. This presents a continued increase in female incidence of lung cancer as suggested by the American Cancer Society.

In 1992, in the United States, an estimated 168,000 individuals will be diagnosed with cancer of the lung and of these 146,000 will die of the disease. Of those diagnosed, 2,800 will reside in Wisconsin. The incidence rate of lung cancer had been steadily increasing in both men and women for several decades, but more recently is starting to decline in men. Unfortunately, women are still seeing the effects of their most recent increase in tobacco use. Regrettably, the majority of these deaths are preventible since most lung cancers are related to tobacco use, in particular cigarette smoking. In addition, certain industrial substances, such as arsenic, organic chemicals, and asbestos may increase the risk of lung cancer particularly in smokers. Radiation exposure medically, occupationally, or environmentally also increases the risk of lung cancer. Regrettably some individuals also develop this malignancy from second hand smoke.

Increasing evidence also supports an increased risk in certain individuals for developing lung cancer when exposed to carcinogenic agents. Genetic factors predisposing to an increased risk of lung cancer may be related to certain metabolic pathways involving carcinogenic environmental agents, and the presence of certain proto-oncogenes and/or autocrine growth factors.

Protective factors may also play a favorable role in decreasing the risk of lung cancer with adequate levels of beta-carotene, vitamin A and E and selenium. These findings have prompted early chemotherapy prevention trials in persons at high risk.

Since the overall cure rate for cancer of the lung is about 10%, any gains that are made in prevention will have a large impact in terms of total lives saved. Of the preventative resources, a reduction in tobacco usage will result in the greatest decrease in morbidity and/or mortality from this malignancy which is the number one cause of death from cancer in both men and women.

Marcia J.S. Richards, M.D.
Smoking cessation is extremely important in the prevention of cancer. It is estimated that changes in lifestyle could reduce the incidence of cancer by 37%. This is particularly important to those individuals who have a family history of cancer or exposure to carcinogens in their home or work environment.

The treatment plan for helping smokers to become smoke free has changed. It now takes into account that smokers have physical as well as behavioral addictions to tobacco. Nicotine is the toxin present in cigarette smoke that is responsible for the chemical addiction. Smokers self-administer nicotine with each cigarette to avoid the withdrawal symptoms of craving, irritability, frustration, anger, anxiety, difficulty concentrating, and/or restlessness.

Nicotine replacement has been used in smoking cessation programs for some time in the form of Nicorette gum. This gum was helpful but required proper instruction on its use and did not taste good. The newest form of nicotine delivery is the nicotine patch. There are many brands available. Smokers considering the patch need to consult their doctors to determine whether the patch is safe for them and which patch would be best tolerated. Pregnant women or nursing mothers are not candidates for the patch because of the potential harm to the fetus or infant. The potential side effects of the patch are: skin irritation, headache, dizziness, upset stomach, drooling, vomiting, diarrhea, cold sweats, blurred vision, difficulty with hearing, mental confusion, weakness, insomnia, and nightmares. These symptoms occur most often if the user has been smoking while wearing the patch or if the strength of the patch is too high for the user. In addition, there has been an increased incidence of heart attack reported in smokers who have been smoking while wearing the nicotine patch. Once a cigarette is lit, the patch must come off and the smoker must determine whether they are truly committed to quitting smoking before the patch is reapplied.

The most important aspect of quitting smoking is learning new coping skills for the situations that trigger the smoking behavior. The greatest success with the patch has been demonstrated in cases where the patch has been used in conjunction with a smoking cessation program.

In summary, quitting smoking takes commitment. There is no completely “painless” method although nicotine replacement can reduce cravings and withdrawal symptoms. Learning to live without tobacco is the key to continued success when the patch comes off. Hard work does pay off. Becoming a nonsmoker means taking control back from that three inch stick of tobacco.

Becky Pogacar, RN
Clinical Coordinator of Pulmonary Rehabilitation
The mortality rate from cancer, which is the second most common cause of death in adult Americans, has increased during the past several decades, all scientific advancements notwithstanding. Lung cancer, which has shown a dramatic and alarming increase, is largely responsible for the sad statistics, and it remains the epitome of a successful malignant disease, accounting for the highest number of annual cancer-related deaths. Ironically, cancer of the lung is among the most preventable of all cancers in that a causative agent - smoking - has been recognized as the most important avoidable cause of death in our society.

The family physician, usually the physician of first encounter is in a unique position. His office serves a dual role when it comes to cancer. It is not only a cancer diagnostic center providing early screening and detection, but just as important, a cancer prevention center providing advise and education to patients about cancer. This becomes vitally important when it comes to lung cancer as it has not proven amenable to screening procedures.

Preventive strategies and techniques, however, do work and it is the family physician who takes the initiative to deliver the important message on the hazards of smoking and tobacco, thus making the patient and public aware of the heavy toll exacted by smoking. The caring family physician will expend efforts at behavioral modification for his/her patients in all health care matters and will direct efforts at 1) counseling patients to quit smoking, 2) offering advise and assistance in stopping, and 3) providing encouragement, reinforcement and support. The family physician will always herald a high index of suspicion when the patient presents with the early warning signs that point to the possibility of malignant lung disease - persistent cough, blood streaked sputum, recurrent bronchitis, unresolving pneumonia and general systemic complaints such as weight loss, anorexia, fatigue, weakness and fever.

While the prognosis for lung cancer remains dismal, the family physician will direct concerted efforts at early detection and prevention. Prevention, after all, is less costly, medically far superior and can be a life saver.

Herbert F. Laufenburg, M.D.

According to CA - A Cancer Journal for Clinicians: For a group of patients diagnosed between 1981 and 1987, 18% of the lung cancer patients are diagnosed at a local stage, 31% are diagnosed at a regional stage, and 39% are diagnosed at a distant stage. The graphs below, for St. Luke’s Medical Center patients, reveal an increase in the percent of patients being diagnosed at a regional stage in 1991 versus 1986. Our rates for other stages of disease at diagnosis appear to be similar to those national rates published in the above mentioned journal.

Herbert F. Laufenburg, M.D.
Standard treatment options utilized for lung cancer treatment include surgery, radiation therapy, and chemotherapy. These modalities may be used alone or in combination. Physicians must weigh several factors before making a recommendation of therapy type for lung cancer. These include the histologic cell type of the tumor, the stage of the tumor and the overall medical condition of the patient.

Although there are several different types of lung cancer recognized by pathologists, in general, the treatment options one considers are based on whether the tumor type is small cell (oat cell) or non-small cell. Small cell cancers account for 20 percent of lung cancers, and the initial treatment for this aggressive lesion is always a combination of radiation and chemotherapy. Non-small cell tumors in patients who are an acceptable surgical risk are considered for surgical resection if the tumor is in an early enough stage. The stage of a cancer is determined by the size and location of the primary tumor and whether or not spread to lymph nodes (glands) or other organs (brain, bone or liver) has occurred. Staging techniques involve multiple diagnostic modalities including: history and physical examination, chest x-ray, blood tests, computed tomography (CAT scan) organ scan, bronchoscopy, needle biopsy and various minor and major surgical procedures. The earlier the stage at which lung cancer is detected, the better the chances for achieving a cure.

Unfortunately, almost one-half of patients presenting with lung cancer already have evidence of distant spread. After further staging, another 25 to 30 percent will be found to be unsuitable candidates for operation. Therefore, only 20-25 percent of patients are surgical candidates.

Before surgery is undertaken, the patient must be evaluated to determine the ability to withstand the stress of the operation. One must also have enough reserve lung function to tolerate the removal of a portion or all of a lung. Depending on the stage and cell type, the patients that are not appropriate candidates for surgical treatment are usually referred for radiation and/or chemotherapy.

Treatment for primary lung cancer is determined by the cell type and stage of the cancer. Options for treatment include surgery, radiation therapy, and chemotherapy or a combination of the three. The following treatment distributions show an increase in the use of radiation therapy in 1991 as a primary treatment modality and a decrease in the use of combined radiation therapy and chemotherapy in 1991 when compared to 1986.
Imaging plays a key role in the diagnosis, staging, and evaluation of treatment regimens for lung carcinoma. The vast majority of cases of lung cancer are diagnosed on standard chest x-ray, often “routine tests” obtained for other purposes. Once diagnosed, more exacting and specific modalities, including computerized tomography, magnetic resonance imaging, and nuclear medicine studies, are undertaken to evaluate for extent of disease, helping to direct to appropriate therapeutic regimen. Occasionally, these higher technology imaging modalities are applied in a specific searching diagnostic role, such as magnetic resonance scanning of the thorax for neoplasms in individuals presenting with ectopic Cushing's Syndrome. In general, these cross-sectional imaging techniques, however, are not warranted on a screening basis.

Transthoracic needle biopsy, either under fluoroscopic or CT guidance, has been performed at St. Luke's Medical Center over the past 12 years, allowing a tissue diagnosis with low morbidity and can, at times, obviate the need for open thoracotomy (Figures 1 and 2). Recently, pre-operative needle localization for thorascopic lung nodule excision in a manner analogous to breast biopsy has been undertaken at our institution.

The staging procedure for lung carcinoma has become more directed with appropriate scans being obtained based on the patient's tumor histology and symptomatology, rather than the “shotgun” approach of the past, saving both time and money. CT scanning for treatment planning is an integral part of radiation therapy for lung carcinoma in the chest. The cross-sectional imaging techniques allow more direct measurement of tumor size to evaluate response to therapy and evaluate the spread of disease.

Thoracic imaging using the various modalities has been and will remain an integral part of diagnosis evaluation and treatment for bronchogenic carcinoma.
The only cure for lung cancer is surgical resection which will depend upon cell type, the patient's overall general medical condition, and extent of disease. Surgery is not indicated when unresectable metastasis are present and except for a rare exception, when the cell type is a small cell carcinoma. Pre-operative pulmonary function testing can help determine whether patients with emphysema and chronic bronchitis could tolerate surgery. The most frequently used test is the spirogram, during which a patient is asked to exhale as rapidly as possible following a deep inspiration. Most normal people can exhale 4 liters of air in one second. Patients with chronic lung disease can still tolerate major surgery if they can exhale only 2 liters in one second. Additional testing is required to assess surgical risk if the exhaled volume in one second is less than 2 liters. In suitable candidates, the overall operative mortality for lung cancer is less than 4 percent and depends upon the extent of resection. Some carefully chosen lung cancers may become operable after radiation therapy. Reduced lung function is usually not a limiting factor if radiation or chemotherapy is needed to control pain, lung collapse or expectoration of blood. However, radiation can injure the lung. The earliest effect is inflammation, (radiation pneumonitis) which may progress to scarring (radiation fibrosis). The overall incidence of these changes is not great but affected patients usually develop shortness of breath and, to a lesser extent, an increase in cough and fever. The early administration of steroids is occasionally effective treatment but fibrosis is not reversible. Chemotherapeutic agents may be toxic to the lung as well but the incidence is fortunately low. Pulmonary complications may include collection of fluid (pulmonary edema), inflammation (pneumonitis), and scarring (fibrosis). Damage can be limited by monitoring with serial pulmonary function tests and chest x-rays.
Surgery remains the primary curative modality in lung cancer. The one stage pneumonectomy first performed by Dr. Graham in 1933 was at one time considered the best curative operation for lung cancer. Subsequently, similar results were obtained with lesser resections and the lobectomy became the gold standard for localized tumors. Most lung resections utilize a posterolateral thoracotomy incision. This incision is well known for the production of postoperative pain. Recent areas of study in thoracic surgery have included: methods to lessen this postoperative pain (and therefore decrease pulmonary complications), better ways to diagnose the indeterminate pulmonary nodule, and interest in lesser resections for primary lung cancer.

The term minimally invasive thoracic surgery refers to an attempt to embrace less invasive methods of accomplishing the same surgical procedures. Minimally invasive thoracic surgery encompasses modified thoracic incisions as well as the recent explosion in endoscopic surgical techniques.

Alterations in thoracic incisions have been attempted as one method of decreasing pain and morbidity. Several modified thoracotomy incisions exist, however, most involve the sparing of the large thoracic musculature instead of the transection of these muscles. Muscle sparing incisions have demonstrated benefits with respect to early postoperative pain as well as shoulder girdle strength. Other improvements have included the use of epidural catheters which have achieved similar success with respect to postoperative pain.

Thoracoscopy or video assisted thoracic surgery (VATS) has emerged as an exciting new modality. It has begun to play a role in diagnosing pulmonary nodules, in staging lung cancer, and in selected cases for definitive resections for metastatic lung lesions as well as primary lung cancers.

We are frequently presented with patients who have new lung lesions that require diagnosis. Many of these patients ultimately come to thoracotomy to achieve this diagnosis. Thoracoscopy has been a welcome alternative for many patients. Peripheral lung nodules can be resected with small incisions and no rib retraction. Even deeper lesions have been resected using the Nd:YAG laser thorascopically. Typical hospital stay has been less than 4 days with pain well controlled by oral analgesics. Our experience with the peripheral lung nodules resected thorascopically has been that over 40% prove to be benign and another 33% have been metastatic. These patients effectively avoid any need for a thoracotomy incision. For patients with primary lung cancer diagnosed from this wedge resection, a more extensive resection is recommended. Most of these patients have subsequently undergone thoracotomy and lobectomy.

There is a subset of lung cancer patients who do not have enough pulmonary reserve to tolerate a lobectomy. For these patients, a wedge resection is a compromise which still offers a chance for survival. Survival figures on Stage I peripheral lung cancers have not been significantly different than similar patients after lobectomy. The main disadvantage of these limited resections has been a higher incidence of local recurrence. Studies are now underway to evaluate thoracoscopic wedge resection with the addition of coned down radiation therapy in an effort to decrease the incidence of local recurrence.

Thoracoscopic lobectomy has been performed but remains experimental. Although it would appear that the pain is less, the hospital stay has not been significantly shortened. Other concerns include more operative risk due to vascular injury and a prolonged time required to perform the lobectomy. Prospective randomized trials remain in progress to try to answer these questions.
SURGERY

Survival in lung cancer is directly related to the stage of the disease. For later staged cancers, the use of multi-modal therapy is available which combines surgery with chemotherapy and radiation therapy. We have used thoracoscopy to help stage patients with lung cancer in order to more ideally design therapy for them. Presently, we know that tumors which spread to mediastinal lymph nodes carry a poor prognosis with surgical resection alone. For these patients, experimental studies involving preoperative chemotherapy and radiation therapy offer some hope of improvement. On occasion, findings at thoracoscopy reveal that surgery would be inappropriate and avoids an unnecessary thoracotomy.

In conclusion, minimally invasive thoracic surgery carries the goal of improving patient comfort and decreasing morbidity. These changes must be achieved without compromising the cancer operation. Thoracoscopy has aided in diagnosing nodules and so has helped to avoid thoracotomy for benign and many metastatic lesions. It offers some advantages for staging in selected patients. For poorer risk patients, it offers the opportunity for resection of the lung cancer and improves their chance for survival. For many patients, these minimally invasive techniques have been a great advantage and we feel fortunate at St. Luke's to remain a leader on a national level with respect to these surgical advances. We hope that by offering a better tolerated method of diagnosing lung cancer that we can identify these patients at an earlier stage and thus improve the five year survival figures.

According to a Professional Education Publication from the American Cancer Society, squamous cell carcinomas were at one time the most frequently noted cell type of bronchogenic carcinoma in the United States. In the last decade, data has showed an increase in the incidence of adenocarcinoma as the most frequently noted histology. This is displayed at St. Luke's Medical Center in 1986 and 1991 where adenocarcinoma was revealed as the most frequently found cell type for lung cancer patients at this facility. The increased incidence of adenocarcinoma has been attributed to several factors, including the increasing frequency of lung cancer among women, occupational and environmental carcinogens, and smoking. Efforts which have been made toward early detection and treatment have failed to reduce lung cancer mortality substantially, therefore, control of cigarette smoking remains the single most important measure for combatting this disease.

Stephen R. Hazelrigg, M.D.
At St. Luke's Medical Center, patients with lung cancer have an opportunity to participate in a spectrum of research programs. These programs are designed to provide the best treatment of their disease, while answering questions critical to the care of all future patients.

Stage I: Chemo-Prevention with 13-cis RA

Patients who have undergone a curative resection of stage I disease are at risk of developing new unrelated cancers within the lung and upper aero-digestive tract. These cancers, called second primary tumors, arise as a result of repeated carcinogenic insult from tobacco use. They arise from multiple independent premalignant and malignant foci, manifest as hyperplasia and metaplasia. The evolution to malignancy occurs in up to 12.5% of long term survivors.

Vitamin A derivatives called retinoids have the ability to suppress carcinogenesis and to reverse the precancerous lung lesions. In early clinical trials, retinoids have reduced the development of second primary tumors. The purpose of the present trial is to confirm these findings and to assess their impact on the survival of patients with resected early stage lung cancer.

By random selection, patients in this trial will receive tablets containing either 13-cis retinoic acid or placebo. The study will compare the incidence of second primary tumors in the treated and control groups.

Stage II: Surgery-RT +/- CT

Although long term survival rates of 50 to 70% can be expected in patients with stage I lung cancer, once local lymph nodes become involved (stage II), the survival drops to 20 to 50%. Many of these patients have undetected residual disease in the chest or micrometastatic disease elsewhere which results in treatment failure. Efforts to treat the residual disease with chemotherapy and radiation therapy have lead to a delayed recurrence and improvement in the median survival. Recently, a new chemotherapy program of cisplatin and VP-16 has produced a high response rate of 45% in advanced disease, and has lead to a significant increase in survival when used postoperatively in resected patients.

Based on this experience, the current trial will evaluate the survival of surgically resected patients with stage II or limited stage IIIA non-small cell lung cancer who are treated postoperatively with radiation therapy with or without adjuvant chemotherapy (cisplatin and VP-16). The trial will also evaluate the effect of radiation therapy alone or radiation therapy and chemotherapy on the time to treatment failure, pattern of local and distant recurrence and toxicity.

Stage IIIA, Potentially Resectable

Some patients who present with regionally advanced lung cancer have disease confined to ipsilateral mediastinal nodes and are potentially resectable. Radiation therapy, surgery, chemotherapy and combinations of these modalities have been tried, but the best treatment for these patients is unknown, and there is no consensus on what constitutes "standard" therapy. In an attempt to clarify this situation, this study will randomly assign patients to one of two treatments. Half of the patients will be treated with radiation therapy, then surgery, then further radiation therapy. The other patients will be treated with chemotherapy, then surgery, then further chemotherapy followed by radiation therapy. The trial will compare the impact of these treatments on the disease free survival and overall survival. It will also describe the patterns of recurrence, the impact of preoperative chemotherapy and radiation therapy on the resectability rates, and will document the toxicity encountered with this combined approach.
Stage IIIA, Unresectable.

Approximately 20% of patients with non-small cell lung cancer present with disease which is confined to the chest but is not resectable because of mediastinal involvement. These patients have been treated with radiation therapy. Long term survival is uncommon and the median survival is 6 to 12 months. Prior efforts to improve on these results by the addition of chemotherapy has had variable success. A recently developed chemotherapy program of cisplatin and VP-16 has lead to a high response rate in advanced disease and when combined with radiation therapy in regionally advanced, unresectable lung cancer, has lead to a 20% disease free survival at three years, compared to 10% in the radiation therapy alone group. Building on this promising result, the current trial will determine the value of adding the radiation sensitizer carboplatin to the previous best treatment program of cisplatin and VP-16 chemotherapy followed by radiation therapy. The trial will evaluate the rate of local disease control and impact on survival.

Stage IV: G-CSF or Ciprofloxacin

Chemotherapy is the major treatment for metastatic lung cancer. Most regimens cause substantial myelosuppression, often resulting in life threatening septicemia. Two strategies have been suggested to combat this problem. Granulocyte colony stimulating factors (G-CSF) can stimulate the proliferation of granulocytes. By combining them with chemotherapy, it is possible to circumvent the risks of myelosuppression. Another strategy is to use prophylactic antibiotics for selective decontamination. The goal of this trial is to compare the benefits of using G-CSF or the prophylactic antibiotic ciprofloxacin, or both G-CSF and ciprofloxacin in patients receiving high dose chemotherapy for lung cancer. The study will compare the incidence and length of febrile granulocytopenia, number of documented infections, number of days of hospitalizations, and the effect of response, survival and toxicity.

Ronald D. Hart, M.D.

Survival rates published in Cancer Facts & Figures - 1991, reveal a five year survival rate of 13% for lung cancer patients with all stages of disease. This rate is also reflected here at St. Luke's Medical Center (see graph below) where a five year survival has been done of patients diagnosed in 1986.
The role of radiation therapy continues to evolve in the treatment of lung cancer. In this section we will review the advances and obstacles to the treatment of this deadly disease. When I see a patient with lung cancer, the questions that cross my mind include: Is the patient's cancer curable? If so, what are the side effects and complications of therapy? If not, is there a high chance of the lung cancer causing suffering and disability before they die? Can we help the patient? To answer the questions above, the patient is staged by a history and physical, CT of the chest, abdomen and occasionally the head, pulmonary function tests, bone scans, plain x-ray films and MRI.

A treatment course is designed to be palliative or curative. The most desired goal is to cure the patient. This is most often done with either radiotherapy alone, or in combination with surgery, chemotherapy, lasers and photodynamic therapy. In patients with advanced disease, one must balance the potential benefit versus the side effects of treatment. The control of symptoms in many patients with terminal illness is as important as cure in patients with early stage disease. External beam treatment is most often used. A dose of 5000 to 6000 cGy can be delivered to the tumor and mediastinum.

Radiotherapy is the most commonly used modality in the treatment of lung cancer. This is due to the fact that most patients are either technically or surgically unresectable at diagnosis. The five year survival for most stage I to III patients treated by radiotherapy alone is in the range of 10-15 percent. This contrasts to the 30-50 percent in patients which are surgically treated. By the selection process, the more advanced and physiologically weaker patients are treated by radiation therapy.

With such poor results, we are studying several innovations to improve the local control of lung cancer. Although 50 to 70% of patients with lung cancer develop distant disease, 50% of patients who die of lung cancer, do so due to progressive disease in the chest. Since lung cancer is so common, and very deadly, improving the cure rate 2% is equivalent to curing all patients who develop Hodgkin's disease in one year.

One of these innovations is called beams-eye-view. This advance in computer technology allows us to see the tumor from the viewpoint of an x-ray beam. This achieves more accuracy in treating the known volume of tumor in the CT or MRI image.

In conjunction with technical innovation, we have also tried to exploit the biologic interaction of radiotherapy with chemotherapy. This is indicated in the physiologically younger patient (less than 60 years old) with lung cancer. Chemotherapy can be added before, concurrent with or after radiotherapy. The most effective approach appears to be concurrent radio-chemotherapy. This can cause complete response rates as high as 40%. In partial responders, surgical resection can follow. Another method of increasing efficacy is to give radiotherapy twice a day. This allows increased tumor cell kill and decreases the long term effects of treatment.

The approaches outlined above apply mostly to non-small cell lung cancer. In small-cell or oat-cell carcinomas of the lung, chemotherapy remains the mainstay of treatment. Radiotherapy is used to consolidate any residual disease in the chest. Since 40% of patients develop brain metastasis, elective cranial irradiation is given usually to patients who have a complete or near complete response to their chemotherapy.

In addition to external beam radiotherapy, brachytherapy (or radioactive implants) can be highly successful in patients with tumors in the trachea, carina or adjacent to the main-stem bronchus. The patients' tumor need to be within 3-4 cm. of the implant for the treatment to be effective. The most common scenario are in the patients with locally recurrent tumors after radiotherapy or surgery. A single 1 to 2 day application can be highly effective in controlling the disease locally (Figure 1).
We have a long way to go before the treatment of lung cancer can be “successful.” Many of the state of the art treatment techniques are studied under research protocols. As members of CALGB (Cancer and Leukemia group B) and RTOG (Radiation Therapy Oncology Group), we bring the latest in research tools to the fight in lung cancer. We urge you to help us participate in this difficult task. We urge you to help your patients stop smoking. We encourage you to enter your patients into clinical oncology trials.

William Pao, M.D.
The School of Radiation Therapy Technology graduated its inaugural class in August, 1992.

For the individual students, Graduation Day marked the completion of 12 months of intensive study.

For St. Luke's Medical Center, graduating 4 students marked the fulfillment of a dream of the radiation oncology department to help address the critical shortage of radiation therapists that threatens cancer treatment centers everywhere. At its inception, we knew this year-long certification program would train therapists with the highly developed skills necessary to administer radiation treatments. The comprehensive program involved studies in math, physics, radiobiology, pathology, oncology, ethics, anatomy and physiology, radiation protection, and nursing. The students were engaged in extensive clinical experiences aimed at developing not only the technical skills required by this demanding, specialized field, but also the compassionate, caring approach to treatment we owe our patients.

All indications are that our efforts have been a resounding success. Our first 4 graduates are currently employed at St. Luke's Medical Center and at other treatment centers in Wisconsin. Furthermore, the skills demonstrated by the graduates who remain with us auger well for the future of the program and the next class of 4 students now in training.

Our success would not have been possible, however, without the wealth of expertise we are fortunate to have here at St. Luke's Medical Center in Radiation Oncology and among other staff, and of course, the invaluable hands-on training available with the state-of-the-art equipment at our disposal. All these factors are essential to the stimulating and rewarding learning environment we have successfully created.

In the coming year, the School of Radiation Therapy Technology will continue to uphold this standard of quality education while developing yet another tradition of health care excellence at St. Luke's Medical Center in which we all can take great pride.

Pam Kresl, RRT
Educational Coordinator
School of Radiation Therapy Technology
The Vince Lombardi Cancer Clinic provides state of the art chemotherapy, immunotherapy and supportive care to patients with cancer. With the support of the Vince Lombardi Memorial Classic funds, the staff offers cancer prevention education, early detection screenings, counseling and support services.

The Vince Lombardi Cancer Hotline receives calls from across the United States regarding information about the latest approaches and treatment of specific cancers. These calls come from health professionals, patients, family members and interested consumers.

Cancer Research is a major commitment of the Vince Lombardi Cancer Clinic.

In 1991 four research studies were undertaken:
- Assessment of Hope in the Adult Cancer Patient
- Smoking Cessation Training for House Officers
- A Dose Escalation Trial of 5FU, Leucovorin and Sandostatin for Advanced Metastatic Colorectal Cancer
- A Test of the Smoke-Free Madres Smoking Cessation Intervention

The Vince Lombardi Cancer Clinic staff supports the Autologous Bone Marrow Transplantation and Immunotherapy Programs by coordinating and performing all of the pheresis procedures. The pheresis program continues to grow in 1992 as we expand our services to include coordination of plasmapheresis for patients requiring treatment for such diseases as myasthenia gravis or guillian barre. The clinic staff continues to work towards making cancer a preventable and controllable disease in 1992. We will continue to have a prominent role in the medical community as a leader in cancer care.
FAMILIES GAINING THE EDGE OVER CANCER

On November 20, 1991, the St. Luke's Medical Center Cancer Program and Vince Lombardi Cancer Clinic presented a public lecture about familial cancers. Our guest speaker was Matthew Lubin, M.D., Director of Medical Genetics at the Strang Cancer Prevention Center, New York, New York. Dr. Lubin's presentation focused on genetically linked cancers, their prevention and early detection. Along with Dr. Lubin, Joy O'Connell, the former Mrs. Brian Piccolo (Chicago Bears football star) shared her family's experience with cancer. Participants in the event received a free Cancer Risk Questionnaire, which was evaluated by the professional staff at the Vince Lombardi Cancer Clinic.

The lecture was the kick-off for a year long focus on cancer prevention, detection and screening. During the year, public lectures and screening programs were offered for prostate, breast, skin, colorectal, ovarian and cervical cancers. Over 2,000 individuals participated in the lectures and screenings, which helped the community gain an awareness of cancer prevention and early detection.

Nancy A. Nowak
Cancer Program Director
St. Luke's Medical Center had participated in the Annual Prostate Awareness Week in 1990 and community interest in the prostate screenings at that time was high. Dr. Stuart Fine, a urologist on staff, was particularly interested in bringing to the men in the Milwaukee community on ongoing screening program for prostate cancer.

In June of 1991, a media campaign was launched to publicize a trial prostate screening program. The response was overwhelming and what was envisioned as a periodic screening offering became a monthly endeavor. Funding for the ongoing Prostate screening program is provided by the Vince Lombardi Memorial Classic.

Individuals who participate in the Screening Program have a Prostate Specific Antigen (PSA) drawn and a Digital Rectal Examination (DRE) performed by a urologist. Men with abnormal DRE's or elevated PSA's are referred to their physicians for follow-up. There were 397 men screened in the initial screenings in June, July and August of 1991. Of the men screened, 115 men were found to have an abnormal DRE and 56 were found to have an elevated PSA. An additional 144 were screened during the 1991 Prostate Cancer Awareness Week in September. In October and November, an additional 108 men were screened, totaling 659 men screened for prostate cancer in 1991. Of those screened in 1991, 131 abnormal DRE's were found and 75 PSA's were elevated. Prostate cancer was detected during follow-up in 6 men.

Since its inception, the prostate screening program has met with favorable response from those who have been screened and those urologists who have shared their time and expertise.

Kerry A. Twite, RN, MSN, OCN
Clinical Nurse Specialist - Oncology
Vince Lombardi Cancer Clinic
In April 1991, Gene Wilder recounted his wife, comedienne, Gilda Radner’s struggle with ovarian cancer at a public presentation at the Pfister Hotel. Several women in the audience spoke of the need for a support group for women with ovarian cancer. That June the first organizational meeting for the Ovarian Cancer Support group was held. Over 40 individuals, both patients and their family members attended. Those present heard the stories women shared of their diagnosis and treatment for ovarian cancer. Family members voiced their concerns about the familial link in ovarian cancer. It was evident from that first night, that women fighting ovarian cancer had some powerful feelings and experiences to share.

The Ovarian Cancer Support Group meets monthly on the first Tuesday evening from 6:30 P.M. to 8:00 P.M. The group averages about 6-8 individuals.

Some common threads are heard in each woman’s telling of her experience with this deadly disease. Symptoms are often vague and insidious and are easily set aside by the woman herself. If she seeks medical help, the physician too may be easily fooled by tests that don’t show anything wrong and vague complaints such as overwhelming fatigue.

Commonly women have shared that diagnosis often takes months, with trips to many and different doctors. Some have been sent to a psychiatrist, only to find out later that they have cancer. These women voice much frustration and anger, that despite attempts to get diagnosed or going to their physician at the first symptom, they were still diagnosed at a late stage.

Finally having reached a diagnosis that “something is wrong”, family members express guilt at minimizing the woman’s symptoms. Spouses feel anger at a disease that can potentially take away their most precious relationship, especially if the diagnostic period was lengthy. Sharing with others who tell the same story is therapeutic — cleansing, energizing, dissipating anger, bonding together in “a mission”.

These women are militant about women being informed about the signs and symptoms of ovarian cancer, the risks, familial tendency, and the most current diagnostic tests. They spread the word to their female family members, their physicians, neighbors and friends. Their intent is to spare others the anguish they have had to endure as a result of lengthy diagnosis.

Though, at times, some individuals found “not seeking out information” as OK, the majority suggested that coping was enhanced by searching the literature, getting a second opinion, and exploring all treatment options. This was particularly true if standard treatment had become ineffective. Several of the women have participated in clinical trials from ABMR to Taxol.

These brave women speak of looking good but feeling devastated and violated by the volume of tests and treatments. “I never thought I’d cope with it, but I do”, “I still never know if I’ll cope with another treatment regime”, “Maybe this will be the one I’ll say no to, I can’t do it, but I do.” It’s often a fine line between being treated as only a person but having others not minimize the toll the disease and treatment take.

Remission is a time of joy, though fear of recurrence often surfaces as an ever present worry. “Time goes slow on chemotherapy: I mark time and worry that this is my last Christmas, but then it comes, and I worry about spring.”

The support group has offered to those women in need a place to share their common concerns and to draw on the strengths of the group to help each individual cope with the experience of ovarian cancer.

Kerry A. Twite, RN, MSN, OCN
Clinical Nurse Specialist - Oncology
Vince Lombardi Cancer Clinic
Cancer touches the lives of one in four American families. When children are touched by cancer, every aspect of their lives is affected - including their performance in school. In an effort to meet the needs of these children, St. Luke's Medical Center, Children's Hospital of Wisconsin and the American Cancer Society sponsored a program, called “What Do You Tell The Children”, for elementary school teachers. This half-day program provided important insights to assist teachers as they try to help children cope when someone in their family or a classmate is living with cancer.

The program included information about cancer prevention, detection and treatment, psychosocial issues of children experiencing cancer, and strategies to help students understand when a classmate has cancer. The American Cancer Society provided an overview of free teaching aids that are available to elementary school teachers.

This program was attended by approximately 50 teachers and principals and received favorable review in the Milwaukee Journal. Comments included, "As a child of a cancer patient and a mother of three year old twins, I found the information presented very useful and helpful as well as comforting and hopeful" and "A great help! Wish all teachers could have been there to share this educational experience with us."

St. Luke's Medical Center and the Vince Lombardi Cancer Clinic continue to promote The Kids' Connection, a support group to help children cope when a parent has cancer and grief support group for young children and teenagers who are grieving the death of a parent or grandparent. If you would like further information, please contact the Vince Lombardi Cancer Clinic Hotline at 649-7200.

Terry Ann Tingwald, RN, BSN, NC
The VNA (Visiting Nurses Association) Community Hospice will mark its third year of service to the community in November of 1992. A program of the Visiting Nurses Association, the hospice was established in 1989 in conjunction with St. Luke’s Medical Center. The program has provided hospice care to approximately 750 patients and families in the greater Milwaukee area.

Hospice care is available to the terminally ill person who no longer wishes to receive active treatment for their disease. The goals of the care the patient receives are to keep the person comfortably at home and to maximize the quality of the remainder of the person’s life. A multidisciplinary team which includes physicians, nurses, social workers, chaplains, therapists, aides, volunteers, family, as well as the patient work together to provide psychological and spiritual support and most importantly, symptom control in the home setting. The VNA Community Hospice has been able to provide 95% of that care at home, although respite and inpatient care are available if needed.

An important element of the hospice program is bereavement follow-up and support for the survivors. This continuity of service can be very helpful in reconciling grief. Bereavement follow-up is on-going for one year following the death of a patient.

Interest in the hospice concept with its emphasis on death with dignity and caring is growing. Hospice care is now a recognized alternative to traditional hospital care for terminally ill patients.

Katherine Kalmer, RN, BSN
Assistant Manager of VNA Community Hospice
Analyzer Cases: Cases which are first diagnosed and/or given their first course of treatment at St. Luke’s Medical Center

Autocrine Factors: A growth factor produced by the cell

Benign: A term for a tumor that does not normally threaten a person’s life (that is, a tumor that is not cancerous and does not attack)

Brachytherapy: The use of implants of radioactive materials such as radium, cesium, iridium, or gold at the site of cancer

Bronchoscopy: The examination of the bronchi with a bronchoscope

Cancer: A tumor that attacks and poses a serious threat to a person’s life

Carcinogenic Agents: Cancer producing substances

Chemotherapy: Treatment with powerful drugs that attack cancer cells

Combined Therapy: Refers to any combination of surgery, radiation, chemotherapy, hormone therapy or other therapy administered jointly as a single course of treatment

Diagnostic Only: Cancer related treatment was not given; this may occur for many reasons; for example, the patient refused treatment, or the patient’s general condition is unsatisfactory for treatment

Distant Stage: A neoplasm that has spread to other organs or lymph nodes from the primary tumor.

Endoscope: A device consisting of a tube and optical system for observing the inside of a hollow organ or cavity

Epidemiology: The study of epidemics and epidemic diseases

External Radiation Therapy: Radiation therapy that uses rays from a machine

First Course of Treatment: The tumor directed treatments started within the first four months after diagnosis

Histology: The study of cells and microscopic tissues

In situ: A tumor classified microscopically as in situ, non-invasive, pre-invasive, non-infiltrating, intraductal, intraepithelial or intraepidermal

Lobectomy: The surgical removal of a lobe from any organ or gland

Local Stage: Tumor restricted to the organ of origin, but may be invasive or infiltrating within the organ of origin

Lymph: A nearly clear fluid collected from tissues around the body and returned to the blood via the lymphatic system

Lymph Nodes: Small bean-shaped structures scattered along the vessels of the lymphatic system. The nodes filter bacteria and cancer cells that may travel through the system

Malignant: A term for a tumor that can threaten a person’s life; that is, a tumor that is cancerous. Malignant has the same meaning as cancerous

Metastasis: The spread of cancer from its original site to distant areas. The cancer cells are carried to distant sites by blood and lymph

Non-Analytical Cases: Cases which are seen at St. Luke’s Medical Center after the first course of treatment
Oncologist: A physician who specialized in treating cancer

Pheresis: A procedure to remove blood from an individual in order to separate certain elements, such as platelets or red blood cells and reintroducing the remaining components into the patient

Pulmonary Function Tests: Tests used to determine the ability of the lungs to exchange oxygen and carbon dioxide. These tests are usually done by measuring the maximum amount of air that can be exhaled after inhaling and the time required for that expiration

Radiation Therapy: Treatment with high-energy radiation from x-rays or other sources of radiation

Regional Stage: A tumor that has extended beyond the limits of the organ of origin into 1) surrounding organs or tissues by direct extension, 2) regional lymph nodes by metastasis, or 3) a combination of 1 and 2 and appears to have spread no further

Recurrence: The return of cancer after a disease-free interval

Stage: A term used to describe the size and extent of spread of the cancer

Staging: Tests conducted to determine the stage of cancer

Surgery: The partial or total removal of the tumor excluding a biopsy

Thoracoscopy: A diagnostic examination of the pleural cavity with an endoscope

Thoracotomy: A surgical incision of the chest wall

REFERENCES


CANCER REGISTRY REPORT

In 1991, 1,440 new patients were accessioned into the St. Luke's Medical Center Cancer Registry: 1,268 analytic, 172 non-analytic. The Cancer Registry now includes over 18,000 patients with a 98% follow-up rate. We have welcomed and appreciated the opportunity to retrieve over 20 requests and inquiries for data to be used in special studies, audits, and research by medical staff, administration and marketing. In the past year we have participated in a Long/Short Term Patient Care Evaluation Study for Cervical Cancer as well as hospital based Quality Assurance studies of Soft Tissue Sarcomas and Cervical Cancer. The graphs and charts comprising the 1991 Cancer Program Annual Report will present a brief overview of cancer diagnosis and treatment at St. Luke's Medical Center. If there are any questions or inquiries for further information, they may be directed to the Cancer Registry staff at 649-6720.

Sandy Blixt, R.R.A.
Cancer Registrar
This primary site distribution presents breast cancer as the most frequently diagnosed cancer site in 1991 at St. Luke's Medical Center. The second most frequent site of cancer, skin cancer, includes all basal cell and squamous cell carcinomas as well as melanomas. Lung cancer continues to be one of the top five cancer sites diagnosed and treated here at St. Luke's. More details regarding lung cancer are available throughout this annual report or by contacting the Cancer Registry.

This age distribution presents the age group of 55 to 84 as the largest percentage of accessioned population at St. Luke's Medical Center. These patients from ages 55 to 84 make up 79% of the total number of new cases for 1991.

Total Number of Patients
Accessioned: 1,440
Female: 730
Male: 710
### 1991 General Summary Stage for All Sites

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number of Cases</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>In situ</td>
<td>71</td>
<td>5%</td>
</tr>
<tr>
<td>Local</td>
<td>646</td>
<td>45%</td>
</tr>
<tr>
<td>Regional</td>
<td>378</td>
<td>26%</td>
</tr>
<tr>
<td>Distant</td>
<td>292</td>
<td>20%</td>
</tr>
<tr>
<td>Unknown</td>
<td>53</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1440</strong></td>
<td></td>
</tr>
</tbody>
</table>

### 1991 General Summary Stage for Top 5 Sites - Breast (226 patients)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number of Cases</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>In situ</td>
<td>25</td>
<td>11%</td>
</tr>
<tr>
<td>Local</td>
<td>116</td>
<td>51%</td>
</tr>
<tr>
<td>Regional</td>
<td>70</td>
<td>31%</td>
</tr>
<tr>
<td>Distant</td>
<td>9</td>
<td>4%</td>
</tr>
<tr>
<td>Unknown</td>
<td>6</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>226</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Skin (187 patients)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number of Cases</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>In situ</td>
<td>17</td>
<td>9%</td>
</tr>
<tr>
<td>Local</td>
<td>155</td>
<td>83%</td>
</tr>
<tr>
<td>Regional</td>
<td>4</td>
<td>2%</td>
</tr>
<tr>
<td>Distant</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>Unknown</td>
<td>6</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>187</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Lung (177 patients)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number of Cases</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>In situ</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Local</td>
<td>42</td>
<td>24%</td>
</tr>
<tr>
<td>Regional</td>
<td>64</td>
<td>36%</td>
</tr>
<tr>
<td>Distant</td>
<td>67</td>
<td>38%</td>
</tr>
<tr>
<td>Unknown</td>
<td>4</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>177</strong></td>
<td></td>
</tr>
</tbody>
</table>
### PROSTATE (159 patients)

<table>
<thead>
<tr>
<th>In situ</th>
<th>Local</th>
<th>Regional</th>
<th>Distant</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>96</td>
<td>34</td>
<td>25</td>
<td>4</td>
<td>159</td>
</tr>
</tbody>
</table>

- **In situ**: 0 cases, 0%
- **Local**: 96 cases, 60%
- **Regional**: 34 cases, 21%
- **Distant**: 25 cases, 16%
- **Unknown**: 4 cases, 3%

### COLON (94 patients)

<table>
<thead>
<tr>
<th>In situ</th>
<th>Local</th>
<th>Regional</th>
<th>Distant</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>28</td>
<td>44</td>
<td>18</td>
<td>2</td>
<td>94</td>
</tr>
</tbody>
</table>

- **In situ**: 2 cases, 2%
- **Local**: 28 cases, 30%
- **Regional**: 44 cases, 47%
- **Distant**: 18 cases, 19%
- **Unknown**: 2 cases, 2%

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**1991 CANCER ANNUAL REPORT SUPPLEMENT**
PRESENTATIONS AND INSTRUCTIONAL SESSIONS

Nursing

Autologous Peripheral Stem Cells: Collection and Reinfusion, Pamela Schroeder, RN, St. Luke's Medical Center

IL-2/TIL Therapy: A Clinical Overview, Carla Rohloff, BSN, OCN, St. Luke's Medical Center

IL-2 Therapy: The Challenge of Patient Education, Melissa Michalak, BSN, Carla Rohloff, BSN, OCN, St. Luke's Medical Center

The Kids Connection: A Support Group to Help Children Cope When a Parent Has Cancer, Virginia Bourne, MSN, RN, CNS, Milwaukee, WI

“Beyond the Bedside: Making the Transition into Nontraditional Roles”, Kathy Oldham, RN, BSN

“Photodynamic Therapy Issues for Managers: Budget and Reimbursement”, Angela D. Klimaszewski, MSN, RN, OCN

“Medicus: One Year of Experience With the Indicators on the Six-Category Tool”, Angela D. Klimaszewski, MSN, RN, OCN

Clinical Controversies and Future Frontiers in Bone Marrow Transplantation, Kathy Oldham, RN, BSN

“New Graduates are an Asset to the Inpatient Oncology Unit: Perceptions of a Preceptor”, Barbara Ritter, RN, BSN, OCN

“Charting by Exception: a Cost-Effective and Efficient Approach to Documentation in the Ambulatory Oncology Setting”, Marija Barthel, RN, BSN

“Psychosocial Adjustment After Bone Marrow Transplant for Patients, Families, and the Community: Resuming Pretransplant Roles”, Kathy Oldham, RN, BSN
Tumor Board Conference

Conferences were held on the second and fourth Mondays of every month at noon. They were patient oriented, multi-disciplinary cancer conferences with an average attendance of 30. For more information or any questions, please call 649-6720.

Head and Neck Tumor Conference

Conferences were held on the first and third Mondays of every month at noon. They were held to discuss selected difficult head and neck tumors from a multi-disciplinary approach. For more information or any questions, please call 649-3900.


February 28, 1991  WHAT IF CURE IS NO LONGER POSSIBLE?  Josefina Magno, M.D.  President, International Hospice Institute  Director, Hospice Education, Research & Development  Henry Ford Hospital  Detroit, MI

September 26, 1991  INTRAOPERATIVE RADIATION THERAPY-PRACTICAL APPLICATIONS IN 1991  R. Dirk Noyes, M.D.  Clinical Associate Professor  Department of Surgery  University of Utah  Salt Lake City, UT

November 21, 1991  INHERITED SUSCEPTIBILITY TO CANCER  Matthew B. Lubin, M.D.  Director of Medical Genetics  Strang Cancer Prevention Center  New York, NY

Schroeder Fellowship Program in Clinical Oncology Programs 1991

March 12, 1991  LILLIAN NAIL, Ph.D., R.N.  Assoc. Dean of Research  University of Utah - School of Nursing  Salt Lake City, UT

May 28, 1991  EDWARD G. SCHNEIDER, Ph.D.  Professor of Physiology  University of Tennessee  Memphis, TN

May 30, 1991  HAJIME FUCHIHATA, M.D.  Professor & Chairman of Dentistry  Osaka University  Osaka, Japan

July 18, 1991  LETHA MILLS, M.D.  Assistant Professor  Dartmouth Hitchcock Medical Center  Hanover, NH

August 2, 1991  R. JEROME LANDRENEAU, M.D.  Assistant Professor of Surgery  University of Pittsburgh  Section of Thoracic Surgery  Pittsburgh, PA