West Allis Memorial Hospital Cancer Program Annual Report, 1994

Aurora Health Care

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CANCER PROGRAM

1994

ANNUAL REPORT

West Allis Memorial Hospital

Aurora HealthCare
The Cancer Committee is a multidisciplinary committee whose function is the overseeing and monitoring of the overall oncology aspects at West Allis Memorial Hospital. In addition to supervising educational efforts for the medical staff, nursing and the general public, the committee supervises the submission of data to the American College of Surgeons who directs both short-term and long-term patient care evaluations.

Highlights of the past year include the every 3 year survey of our Cancer Program by the American College of Surgeons for the continued accreditation. I am pleased to report that our program has met all of the requirements and has received an unqualified 3 year renewal.

In other areas, the Cancer Committee undertook a review of the treatment of prostate cancer at West Allis. Patients initially diagnosed in 1978 were compared to patients diagnosed in 1988. A substantial improvement in 5 year survival was documented which related mainly to the earlier diagnosis of this common malignancy. The use of prostatic specific antigen (PSA) as a screening tool and transrectal ultrasound as a diagnostic tool have also greatly increased the chances of finding this tumor at an earlier stage.

In conjunction with this West Allis participated in an American College of Surgeons sponsored study reviewing the short-term and long-term effects of radical prostatectomy in gentlemen with prostate cancer. We await the long-term results from the national study.

The Cancer Committee also supervised our participation in both the short-term and long-term patient care evaluation studies of patients with cancers of the larynx and hypopharynx. This participation forms the basis for our report this year and later in this report, you will find articles describing the surgery, chemotherapy, and radiation therapy aspects of these types of cancers.

Throughout the past year, the Cancer Program at West Allis Memorial Hospital has maintained its tradition of excellence in the therapy and support of those people afflicted with this disease. This requires the continued dedication of all those who participate and I applaud their excellent work.

Kevin J. Murray, M.D., Chairman
INTRODUCTION

The American Cancer Society, Atlanta, estimates that one in three Americans now living (about 83 million) will develop cancer at some point in their lives. For every 1,000 population, 16 are under medical care for cancer symptoms, four will be new cancer cases in 1995 and 300 will develop cancer.

Cancer is the disease of the future. Although cancer can strike at any age, experts say that older Americans will continue to account for the bulk of cases. Meanwhile, the U.S. population is growing older, and living longer.

In 1971, one in three cancer patients lived five years or more after their diagnosis. Today, nearly half will do so, according to the American Cancer Society.

The Commission on Cancer of the American College of Surgeons (ACoS) sets the standards for cancer care in the nation. It has become one of the most important organizations in the fight against cancer. For this reason, West Allis Memorial Hospital sought accreditation of their Cancer Program by the ACoS. This program has been continuously certified since 1978.

Program approval benefits patients, professional staff members, the hospital, as well as the community. The Cancer Program concentrates not only on the diagnosis and treatment of cancer, but on prevention, screening, education, nutrition, rehabilitation, patient care evaluation, follow-up, support programs, and more.

Without an organized program, you don’t really know what is happening to your cancer patients. Major emphasis is placed on planning for seamless care of the cancer patient. The goal is to develop a functionally integrated continuum of care. This requires well developed outreach activities.

Lifetime follow-up of cancer patients is imperative. Patients cured of one cancer are not immune to developing a second. Many such patients have a higher than average chance of developing a second primary cancer.

Even when there is a recurrence, some patients have a second chance of cure. Many cancers now exist in which a significant remission lengthens useful life as compared to the natural course of the disease as measured in the past or as compared to those treated who do not respond.

The purpose of cancer therapy is not to prolong suffering. Even when there is no chance of cure or prolongation of life, cancer treatment often allows a much better quality of life, control of pain, and at times prevention of paraplegia. Many patients with cancer who used to have prolonged hospitalizations died a very painful death; they now can have significant periods of good quality of life at home under the care of their primary physician.

From a purely economic point of view, the cost savings from eliminating a few days hospitalization would pay for much outpatient care. A strong Cancer Program has the ability to balance quality with cost.

This report of the Cancer Committee of West Allis Memorial Hospital is an effort to summarize the evolving program of this institution to assure that patients with cancer receive the best possible care available.
# 1994 Cancer Committee Members

## Member
- Kevin Murray, M.D., Chairman
- Linda Barrows, M.D.
- Donald Blatnik, M.D.
- Mark Dorow, M.D.
- Donald Feinsilver, M.D.
- David Foley, M.D.
- Jeffrey Gorelick, M.D.
- Ronald Hart, M.D.
- Christopher Kubat, M.D.
- Terence Roth, M.D., ACoS Liaison Physician
- Stephen Sperling, M.D.
- Robert Taylor, M.D.
- Shelly Underhill, M.D.
- Henry Waldren, M.D.
- J. Frank Wilson, M.D.
- Irving Wright, M.D.
- Patrice Qualey
- Beverly Hochtritt, R.N.
- Barbara Daso, R.R.A.
- Vicki Shackley, R.N.
- Carmen Bolger-Linna, R.N., O.C.N.
- Priscilla Eckert, A.R.T., C.T.R.

## Service
- Radiation Oncology
- Physical Medicine
- Otolaryngology
- Family Practice
- Psychiatry
- Gynecology/Oncology
- Physical Medicine
- Hematology/Oncology
- Urology
- General Surgery
- Diagnostic Radiology
- Hematology/Oncology
- Pathology
- Obstetrics/Gynecology
- Radiation Oncology
- Anesthesiology
- Administrative Assistant
- Ass‘t. Nursing Administrator
- Director of Health Information Services
- Director of Quality Assessment
- Oncology Nursing
- Cancer Registrar
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Tumor Boards are held every week at noon on Fridays. The luncheon conference brings together a multidisciplinary group of physicians and allied health professionals to discuss individual cancer cases and current methods of diagnosis and treatment.

Case Presentations

The cases are presented by attending physicians. Pathologists show slides of the tumor specimens and radiologists show and review the radiographic studies that were performed. These case presentations are both current and prospective, and offer the attending physicians the opportunity to request recommendations for patient management. Prospective case review assures the newly diagnosed patient access to multidisciplinary pretreatment evaluation, accurate staging of disease, treatment management, and follow-up evaluation.

Conference Benefits

The case reviews generate new knowledge, provide a review of basic cancer management principles, identify areas for audit review, provide opportunities for discussion of research eligibility, improve effectiveness of allied health personnel in caring for cancer patients, identify possible community needs for education, screening, detection and prevention clinics. Tumor Board provides a mechanism for review of professional practices within the hospital for the purpose of reducing morbidity and mortality through outcome analysis.

Attendance

In 1994, 166 cases were presented at Tumor Board, an average of over three patients per week. There was an average of 35 persons in attendance each week. The cases presented were representative of all major cancer sites treated at West Allis Memorial.

Continuing Education Credit

The Tumor Boards and Continuing Medical Education programs presented each Tuesday are approved for continuing education credit by the Wisconsin Medical Association, and the American Academy of Family Practice for one credit hour in Category I of the Physicians' Recognition Award of the American Medical Association.

Cancer-Related Continuing Medical Education Programs

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<td>Chronic Lymphocytic Leukemia</td>
<td>Maury Berger, M.D.</td>
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<td>Prostatic Cancer: Utilization of Prostate Specific Antigen in its Detection and Monitoring</td>
<td>Christopher Kubat, M.D.</td>
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<td>Bone Marrow Transplantation in Patients with Breast Cancer</td>
<td>Robert Taylor, M.D.</td>
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<td>Prostate Cancer - PSA: What Does it All Mean?</td>
<td>John Pope, M.D.</td>
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<td>Recent Advances in Early Stage I Lung Cancer</td>
<td>Ronald Hart, M.D.</td>
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<td>11/1/94</td>
<td>Controversies Regarding Screening and Treatment in Prostate Cancer</td>
<td>Mark Rosen, M.D.</td>
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CANCER REGISTRY

Name Change

The Tumor Registry name has been changed to Cancer Registry. This name is more representative of its function and is more in line with state and national registry associations recent name changes. The Cancer Registry is a cancer data services department.

Computerized Records

The registry utilizes computers and a software program of Electronic Registry Systems for online abstracting, follow-up, and reporting. The information collected is grouped in four general categories:

Patient Identification: Over 25 items are collected including age, sex, race, marital status and demographic data.

Cancer Identification: Primary and secondary site, histology, stage at the time of diagnosis, extent of disease and diagnostic methods are collected.

Cancer Treatment: Treatments rendered at the time of diagnosis and any subsequent treatment rendered for recurrent disease are recorded by modality. Names of physicians who treated the patients are also collected.

Follow-up Information: All patients diagnosed and/or treated at West Allis Memorial are followed by the registry for the lifetime of the patient. The information collected includes whether the patients are alive or dead, with or without cancer, the quality of life during their survival time, and their disease-free survival time. Follow-up letters to physicians are computer-generated.

Reporting Capabilities

Cancer incidence, survival and treatment graphics and statistical reports are possible from any combination of the data items collected. This can be accomplished through both "canned" reports and/or adhoc reports to complete any individualized requests. National Cancer Data Base (NCDB), Wisconsin Cancer Registry System, and American College of Surgeons long and short-term study reporting are accomplished by computer diskette.

Cancer Committee Activities

The registry works closely with the Cancer Committee. Under the auspices of the Cancer Committee, the registry assures that all components for an approved Cancer Program are maintained. The registry assisted the Cancer Committee in collecting data for the American College of Surgeons (ACoS) and long and short-term larynx, hypopharynx studies. The results of the larynx and hypopharynx are reported in another part of this report. Data were also collected for participation in a research study with the Blood Center of Southeastern Wisconsin entitled: Trial to Reduce Alloimmunization to Platelets (TRAP) study.

Database

Since January 1, 1978, the registry has accessioned over 12,000 new cancer cases. In 1994, 882 new cancer cases were added to the registry. Lifetime follow-up rate was maintained at an average of 94%. Lifetime follow-up gives physicians a continuous perspective of the results of treatment strategies utilized.

Continuing Education

Registry staff, in addition to attending weekly Tumor Boards, also attended the 26th Annual Southeastern Wisconsin Cancer Conference in Milwaukee, a TNM staging workshop in Rhinelander, WI., and the 19th Annual Wisconsin Cancer Registrar’s Association Conference in Marshfield, WI. These meetings provide training and invaluable information on changes in the cancer registry data collection requirements, as well as current changes in cancer diagnosis and treatment.

Requests for Information

During 1994, twenty-one requests for registry information were received. The registry staff welcomes the opportunity to assist medical staff members to retrieve cancer data.
WEST ALLIS MEMORIAL HOSPITAL

CANCER PROGRAM

TREATMENT SERVICES

Inpatient Oncology Unit
Outpatient Oncology Unit
Inpatient and Outpatient Surgery
  Laser Surgery
  Laparoscopic Surgery
Chemotherapy Administration
  Immunotherapy
  Hormone Therapy
Blood Administration
Radiation Therapy
  Linear Accelerator
  Brachytherapy
Computerized Treatment Planning
Radiologic Diagnostic Technology
  X-ray
  CT scan
  Magnetic Resonance Imaging
  Ultrasound
  Radionuclide scans
  Dedicated Mammography
Diagnostic Laboratory Services
  Histology and Cytology
  Hematology
  Microbiology
  Immunohistochemistry
  Urinalysis
  Serology
  Industrial Toxicology
  Coagulation
Emergency Care Services

COMMUNITY SERVICES

Stop Smoking Programs
Breast Cancer Screening Clinic
Physician Referral Service
Health Information Services
Prevention and Screening Programs
Cancer Information Services
  Senior Services Program

PROFESSIONAL EDUCATION

Tumor Boards
  Continuing Medical Education Programs
  Oncology Nursing Inservices

RESEARCH

Institutional Review Board
  Clinical Trial Protocols
  Cancer Registry
  National Audit Participation

ANCILLARY SERVICES

Oncology Nursing Services
  Enterostomal Therapy
  Physical Medicine
  Physical Therapy
  Occupational Therapy
  Speech Therapy
  Pulmonary Laboratory
  Nutritional Services
  Pharmacy
  Home Care Services
  Biofeedback Therapy
  Support Services

PATIENT AND FAMILY SUPPORT SERVICES

WAMH Van Transportation
  Home Laboratory Services
  Home Care Program
  Meals Ala Wheels
  Positive People Support Group
  Caregivers Support Group
  Living Through Loss
  Pastoral Services
  Financial Counseling
  Hospice Care
  Medical Equipment and Supplies
  Patient Education
  Lifeline
  Mastectomy Teaching
  Enterostomal Teaching
  Telecare

ACCREDITATIONS

American College of Surgeons,
  Commission on Cancer
Joint Commission on Accreditation of
  Healthcare Organizations
College of American Pathologists
ACCESSION YEAR DISTRIBUTION
1978 - 1994

NUMBER OF CASES

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*Analytic cases are those which were diagnosed and/or treated at WAMH. Non-analytic cases are those which were diagnosed and had their 1st course of therapy elsewhere and were seen at WAMH for recurrence and/or subsequent treatment.
## PRIMARY SITE TABULATION FOR 1994 ACCESSIONS

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## PRIMARY SITE TABULATION FOR 1994 ACCESSIONS

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### KEY

- **CLASS A**
  - **ANALYTIC CASE** - PATIENTS DIAGNOSED AND/OR RECEIVED ALL OR PART OF THEIR FIRST COURSE OF THERAPY AT THIS HOSPITAL

- **CLASS N/A**
  - **NONANALYTIC CASE** - PATIENTS DIAGNOSED AND TREATED ELSEWHERE WHO WERE SEEN AT THIS HOSPITAL FOR RECURRENCE OR PERSISTENT DISEASE OR WERE FIRST DIAGNOSED AT AUTOPSY

- **STAGE INS**
  - **IN SITU STAGE** - NONINVASIVE CANCER

- **STAGE LOC**
  - **LOCAL STAGE** - CANCER CONFINED TO THE ORGAN OF ORIGIN

- **STAGE REG**
  - **REGIONAL STAGE** - DIRECT EXTENSION OF CANCER INVADING BEYOND THE ORGAN OF ORIGIN AND/OR REGIONAL LYMPH NODES

- **STAGE DIST**
  - **DISTANT STAGE** - DISCONTINUOUS EXTENSION OF CANCER TO SURROUNDING OR DISTANT ORGANS AND LEUKEMIAS

- **STAGE BEN**
  - **BENIGN TUMORS**

- **STAGE UNK**
  - **UNKNOWN STAGE** - STAGING WORKUP WAS NOT COMPLETED

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6
In 1994, 54 percent of the cancer patients were female and 46 percent were male. Respiratory system cancers were 50 percent more common in men than women. Men had twice the incidence of oral cavity cancers. Sex-related organs for both sexes continued to be the most common sites for cancer.
Women continue to be diagnosed at an earlier stage than men. The majority of the in situ cancers in women are of the breast and cervix. This is in direct relationship to effective screening methods, including the Pap smear and mammography.

The unstageable category includes those sites that do not have a staging scheme such as leukemias and unknown primaries. This category also includes those patients for whom a complete staging work-up was not possible, for whatever reason.

Surgery remains the most common treatment for cancer, followed by radiation therapy and chemotherapy. This also reflects the fact that the majority of the cancers are diagnosed at an earlier stage when surgical or radiation therapy can provide a cure.

In reviewing treatment combinations, surgery was combined with other treatment modalities for 200 patients. Radiation therapy was used in combination with other modalities of treatment for 162 patients. Chemotherapy was used in combination therapy for 123 patients.

1994 ANALYTIC CANCER ACCESSIONS
AJCC TNM STAGE BY SEX
CANCER OF THE
LARYNX AND HYPOPHARYNX
INCIDENCE AND THERAPY FOR CARCINOMA OF THE LARYNX AND HYPOPHARYNX

By Donald S. Blatnik, M.D.

Carcinoma of the larynx and hypopharynx makes up about 3% of the malignancies diagnosed annually. It had a 7:1 predilection for males over females. It is now a 4:1 predilection. The incidence in the female populations is rising, as is the smoking history in the female population. Eighty percent of these cancers occur between ages fifty and eighty. At least fifty percent of the cancers arise from the vocal cord area. Vocal cord cancers fortunately present very early with hoarseness and have a very high cure rate because of this presentation. The carcinomas that do not arise from the vocal cords frequently present with dysphagia, sore throat or otalgia and as a result, are diagnosed later and are more advanced. Some of the tumors present with a mass in the neck at an even later stage and have a much poorer prognosis.

There is a higher incidence of carcinoma in the black population than in the white population. Carcinoma of the larynx and hypopharynx has a very low incidence in nonsmokers. There is a higher incidence of cancer of the larynx in alcoholics. The exposure to both alcohol and tobacco markedly elevates the risk for these cancers. There also seems to be some increased risk in metal workers, asbestos workers and possibly textile processors.

Patients who have a cancer of the larynx have about a 3.5% incidence of having another simultaneous primary in the head and neck, a 4% incidence of having a simultaneous primary in the lung, a 2.4% incidence of having another simultaneous primary somewhere else in the body. Patients with cancer of the larynx have a previous history of cancer in the head and neck in 1.6% of cases, a previous history of lung cancer in 1.5% of cases and a history of cancer elsewhere in about 7% of cases. Patients with a diagnosis of cancer of the hypopharynx have a 6.7% incidence of having another simultaneous primary in the head and neck. They have a 4% incidence of having a simultaneous primary in the lung, a 3.9% incidence of having a simultaneous primary in the esophagus and a 3.7% incidence of having a simultaneous primary in another area of the body. Patients with cancer of the hypopharynx have a 5% incidence of a previous head and neck cancer, a 1.6% incidence of a previous lung cancer and a 8.5% incidence of having had a previous cancer to another site of the body. For these reasons, it is important to evaluate these patients for other primary tumors at the time of their diagnosis, as well as in follow-up.

**LARYNGEAL CANCER**

T1 carcinoma of the vocal cords has a high cure rate of 80 - 90% with radiotherapy. This is frequently diagnosed early because of its early presentation of hoarseness. The in situ carcinomas and small cancers of the vocal cords can be treated simply with CO2 laser therapy which is both expeditious and has an equally high cure rate. If the lesions extend to the anterior commissure or onto the arytenoid, radiotherapy is the method of choice. When there is deeper infiltration the voice is better with radiotherapy, but the treatment is much
more expeditious with the CO₂ laser treatment and thus, patient’s choice should be considered.

T2 carcinomas of the larynx are usually treated with radiotherapy because of the better voice quality. However vertical hemilaryngectomy can also be used. The larger T3 and T4 cancers of the vocal cords are frequently treated with surgery of various types, followed by radiation therapy. In some instances a near total laryngectomy can be done creating a shunt connecting the trachea and hypopharynx so that the patient can speak. If this procedure cannot be done, a tracheoesophageal shunt tube can be inserted connecting the trachea and esophagus. This can give very satisfactory voice in most total laryngectomy patients. There are still a few patients that require the use of esophageal speech or in rare instances, that use a vibrating external device to create speech.

Supraglottic carcinomas are the cancers that are above the vocal cords. The early lesions, T1 and T2, are generally treated by means of radiation. Frequently, however, these lesions present late and are more advanced. When they are more advanced both surgery and radiation are indicated. In some instances a supraglottic laryngectomy preserving the vocal cords can be done, however, some of these patients do have problems with aspiration. If the patient has significant chronic obstructive pulmonary disease this procedure is contra-

indicated. Supraglottic lesions frequently do have bilateral metastases when they are of significant size, therefore, both necks have to be treated. Neck dissections for cancer in the head and neck are usually modified. The classical radical neck dissection is not done very often.

**HYPOPHARYNGEAL CARCINOMA**

Cancer of the hypopharynx including the pyriform sinuses is generally found at a much later stage because of its presentation with dysphagia. Hoarseness is only found in the late stage of the disease when it has invaded the intrinsic larynx and vocal cords. These tumors have a higher incidence of neck metastases. They are frequently treated with laryngopharyngectomy, neck dissection and radiation therapy because of their more advanced stage. At times, a near total laryngectomy can be done when a portion of one vocal cord can be saved. These patients then can speak by means of their surgical shunt. If that is not able to be performed, tracheoesophageal shunt tubes can be placed to give patients satisfactory speech in most instances. The extremely large cancers of the larynx and hypopharynx can be treated with total laryngopharyngectomy and chest flaps or microvascular flaps. Sometimes gastric pull ups or microvascular bowel anastomoses are done. These procedures can be very prolonged and obviously the cure rates are diminished.
Anatomically, the larynx is contiguous with the pharynx above it and is connected with the trachea below it. It extends from the tip of the epiglottis at the level of approximately the C-3 vertebral body to the lower border of the cricoid cartilage at the level of C-6. The larynx is divided into 3 anatomical regions including the supraglottis, glottis, and subglottic areas. Cancers of the subglottic area are relatively rare and will not be mentioned further. The supraglottic area can be subdivided into the epiglottis, aryepiglottic folds, arytenoids, and false cords. The glottis consists of the true vocal cords, their connection anteriorly at the anterior commissure as well as the posterior commissure. The hypopharynx extends on either side of the larynx and includes the pyriform sinuses, pharyngeal wall and the posterior cricoid area.

The objective of treatment for carcinoma of the larynx and hypopharynx is to obtain the best cure rate with the optimal preservation of function (namely, voice quality). Radiation therapy and surgery alone or in combination have been the primary treatments for carcinoma of the larynx and hypopharynx. Radiation is traditionally delivered with external beam approaches. Surgical procedures including endoscopic procedures, laser excision, cordectomy, hemilaryngectomy or supraglottic laryngectomy have been used to maximize voice preservation. Total laryngectomy is necessary for the treatment of advanced carcinomas and results in complete loss of normal voice function. Recently, chemotherapy has been combined with radiation therapy and has been used to improve the treatment of advanced operable laryngeal cancer with the goal of increasing organ preservation.

Selection of treatment for the individual patient depends on the number of factors including the site and extent of disease, the mobility of the vocal cords, whether there is invasion of surrounding structures, growth characteristics of the tumor, histology, general medical condition of the patient, and patient preferences.

Generally, early lesions of the vocal cords can be treated successfully with either surgery or radiation. Advanced lesions generally require surgery with or without the use of postoperative irradiation. Exophytic lesions are usually more responsive to radiation therapy than infiltrative lesions. Radiation alone or combined with surgery may be the preferred treatment for poorly differentiated carcinoma.

At West Allis we are participating in a number of national studies looking at various treatment approaches in cancers of the larynx and hypopharynx. The majority of these are sponsored by the Radiation Therapy Oncology Group. The first study is a Phase III or randomized study to compare the long term success with 4 different types of radiation therapy delivery. The first utilizes a standard radiation therapy approach of one treatment per day, five days per week for a total of approximately 7 weeks. The second approach uses two treatments of a slightly lower dose per each treatment. This then results in slightly more radiation per day than the standard approach. The treatments are again five days a week for approximately 7
weeks. A third approach uses two treatments per day but each treatment is close to the size of the standard radiation therapy treatment. This results in a great increase in the amount of radiation per 24 hour period. However, this is associated with an increase in side effects as the patient continues through the radiation therapy treatments. Patients are therefore given a small break in the middle of their treatment to allow for some of their side effects to resolve. The last of the four approaches uses two treatments per day but the first treatment in the day is given to a large treatment field to encompass the tumor plus the areas of potential likelihood of spread. The afternoon treatment however is more focused on the area of tumor alone.

This study is proceeding exceedingly well with over 700 patients enrolled in this study nationally. West Allis Memorial has contributed several patients to the ongoing effort in this regard.

A second approach that is being done for some tumors of the larynx is an approach to try to preserve the larynx using a combination of chemotherapy and radiation therapy. The major endpoint is the evaluation of long term survival with associated preservation of normal laryngeal function (i.e., namely voice quality). Other endpoints include an evaluation of the response of the tumor to the chemotherapy agents that are given, determination of difference in the type of relapse that may occur, and whether the use of combined radiation therapy and chemotherapy is associated with a significant increase in both short term and long term side effects of therapy. This study is relatively recent and has accrued approximately 200 patients and will continue to be open for the next 4 - 5 years.

Lastly, a very interesting area has begun to be explored. This is whether or not there are drugs that will prevent actual tumors from starting (otherwise known as chemoprevention). It is well known that patients who develop an initial cancer of the mouth, throat, and voice box are at a significant risk for development of the second tumor. In the laboratory, the use of retinoic acid has been documented to decrease the development of these second cancers. Currently, approximately 700 patients including some from West Allis, have been entered on this study to see if the daily administration of retinoic acid will prevent the development of a second cancer 1 - 2 years in the future.
Approximately 43,000 cases of invasive head and neck cancer are diagnosed annually in the United States. Two-thirds of these patients have either stage III or stage IV disease at the time of involvement with either large primary tumors and/or regional lymph nodes. Surgery and radiation therapy are considered standard treatments at the present time; however, because of the unacceptably high recurrence rates (between 60 and 100%), other possibilities are obviously needed. In addition, second tumors occur at a constant rate of 3 to 4% a year and therefore represent another threat to such patients.

Over the past two to three decades, the role of chemotherapy in such patients has evolved considerably from its accepted indication as palliative therapy for recurrent disease to a more front line component in patients with initially advanced disease. The addition of Cisplatinum to the combination chemotherapy regimen in the 1970’s greatly improved the response rates, and subsequent attempts at concurrent chemo-radiotherapy, utilizing Cisplatinum based chemotherapy, were initiated in the 1980’s. The third evolution of chemotherapy has been its use in an adjuvant setting, either in sequence or simultaneously with radiotherapy. Finally, as organ preservation becomes more of an important issue, the use of either chemotherapy alone or chemotherapy given concurrently with radiation has been discovered.

Treatment of Advance Disease

As palliation for advanced disease, chemotherapy has received considerable use in the past several years. Several different combination chemotherapy regimens have been used including Cisplatinum, 5FU, Bleomycin, methotrexate. By-and-large, the use of platinum based chemotherapy combinations have been the most effective and widely utilized and yield superior results to single agent therapy such as methotrexate. Median survival time for treatment of patients with advanced or recurrent disease, treated in this fashion ranges between five to six months, with 5FU/Cisplatinum being the most favored of the combinations.

Recently carboplatin has been used instead of Cisplatinum in these combinations and has been found to be equipotent. Carboplatin, because it can be given as an outpatient and is less nephrotoxic, has a great appeal, particularly in a group that may be elderly and may have impaired renal function. Utilizing either the Calvert or Egorin formulas, these drugs can be given safely to patients with impaired renal function. A relatively new agent, paclitaxel (Taxol), has also been used in head and neck cancer and has shown favorable activity. In fact, some studies suggest that Taxol may be the most effective single agent used in this approach.

Neo-adjuvant Chemotherapy

The use of Cisplatinum based chemotherapy results in an average overall response and CR response rates of approximately 85 and 35% respectively. A number of randomized clinical trials, comparing induction chemotherapy fol-
allowed by surgery and radiation therapy, have been published and reviewed. No significant differences in survival have been demonstrated with the use of adjuvant chemotherapy; however, the major cause of failure in these patients has been the failure of the combined modality therapy to improve local regional control of disease. Several trials have shown a decrease in the incidence of distant metastatic disease but, because of the great tendency of these tumors to recur locally, overall survival has not been affected.

When used in patients who are considering organ preservation, the combination of Cisplatinum and 5FU followed by radiation therapy in those patients who responded to chemotherapy was compared with laryngectomy and postoperative radiation. The CR rate, after three cycles of chemotherapy, was 65%. Disease-free survival was identical in the chemotherapy treated arm and the radical surgery arm, suggesting that organ preservation can be achieved in patients with high risk tumors through the use of this combination without sacrifice of long-term disease-free survival. Therefore, induction chemotherapy followed by radiotherapy still has a defined role as an alternative treatment to total laryngectomy in advanced squamous cell carcinomas of the larynx, in patients desiring preservation of speech. More effective chemotherapy agents, as well as optimization of other methods for local regional control, are obviously still needed.

The use of adjuvant chemotherapy for patients who have been rendered free of disease via surgery has been only tested in one large randomized clinical trial. In this study, patients with resected stage III or stage IV squamous cell carcinoma of the oral pharynx, larynx or hypopharynx were randomized to receive immediate radiotherapy or three cycles of adjuvant chemotherapy followed by radiotherapy. While analysis showed no difference between the two arms in terms of overall survival, a significant reduction in the incidence of distant metastatic disease at any time was observed in patients receiving adjuvant chemotherapy. In addition a high risk group of patients was identified in whom both local regional control and survival differences approached statistical significance.

**Concurrent Chemo-radiotherapy**

Another role for chemotherapy in head and neck cancer has been as a means of sensitizing tumor cells to the effects of ionizing radiation. Disease-free and overall survival for single agent 5FU/bleomycin and mitomycin combined with radiotherapy have been shown. Cisplatin and carboplatin provide another opportunity to demonstrate the synergy, because neither agents aggravate mucositis as a primary toxicity. Platinum based chemotherapy has been tested, primarily in patients with locally advanced unresectable disease, and several studies show a significantly higher overall response rate in patients with combined modality treatment. Unfortunately again, there was no overall impact on survival. The RTOG utilized an alternating dose and scheduling of Cisplatinum with complete response rate in 124 or 71%. The four year survival rates were compared with the standard therapy without chemotherapy and showed an improved response rate. The use of chemo/radiotherapy obviously deserves additional attention, as do the use of other potential radio-sensitizing agents.

In conclusion, the use of chemotherapy in head and neck cancer has evolved, both in terms of the drugs that have been used to treat these diseases and the methods whereby the treatment is administered. It appears likely that chemotherapy may reduce the risk of distant metastatic disease but, because of the persistent high risk for local regional recurrence of these diseases, the overall effect on survival has been diminished. Clearly, better means of controlling these diseases locally will be necessary before substantial improvements in overall and disease-free survival can be realized.
REHABILITATION ISSUES IN LARYNGEAL CANCER

By Dr. Linda Barrows, Physiatrist

Linda J. Barrows, M.D.

INTRODUCTION

Over 8 million Americans alive today have a history of cancer. Of these, 5 million were diagnosed five or more years ago, most of whom are now considered cured. This year 1,252,000 new cancers will be diagnosed (excluding carcinoma in situ, basal and squamous cell skin cancers).

Approximately 9,000 males and 2,600 females cases will be diagnosed with cancer of the larynx this year, with a 4:1 male to female ratio and average age at onset of 63 years. Today more conservative management of early cancers is possible, such as being able to spare the voice in cancer of the larynx. Survival rate continues to improve for laryngeal cancer, especially if lesions on vocal cords are found early. Increasing numbers of long term survivors will now face quality of life issues.

Smoking and drinking are two leading risk factors for laryngeal cancer, especially if combined. Smokers are also at risk for carcinomas of the lung, mouth, tongue, lip, bladder, pancreas and esophagus. Other factors such as industrial exposure to toxins, such as may be found in the metal, lumber, railroad or farming industries, genetic predisposition, viruses and accidents might also play a role.

Squamous cell carcinoma of the larynx is the most frequent cancer of the upper air and food passages. Often hoarseness, or change in the sound of the voice is the first evidence of laryngeal disease, prompting early diagnosis and successful treatment. But cancers arising above and below the true vocal folds may give no early warning and are often larger when detected. One may have only a vague sore throat, pitch change or a reduction of loudness of voice, referred ear pain, difficulty with swallowing, a lump in the neck from metastasis, but no hoarseness until later on.

When detected at an early stage, cancer of the larynx is one of the most curable of all cancers. For smaller tumors, particularly those on the vocal cord, radiotherapy may be the treatment of choice and is less ablative than surgery. The extent of normal tissue resected in the larynx depends on the site of the malignancy given the lymphatic drainage to the region. Tumors are staged according to size, status of lymph nodes and for distant metastases. In carefully selected patients treatment may include conservation surgery with preservation of a functional larynx. Only a relatively small number of these procedures will require extensive vocal rehabilitation.

A total laryngectomy may be required for some advanced tumors or if radiation treatment fails to control the laryngeal cancer. In some cases, a radical neck dissection, preoperative or postoperative radiation therapy or chemotherapy may also be required.

The surgeon and speech therapist may provide the patient and spouse with valuable information before surgery, when it is easier to communicate effectively. The patient can be instructed about the alterations of physiological functions of speech and swallowing, types of
available replacement speech, as well as the appearance that cancer treatment may produce. Treatment may involve relearning basic skills, such as swallowing and working with a speech therapist to master new forms of communication. To also help inform and ease anxiety, preoperative or postoperative hospital visitations with a volunteer from the American Cancer Society who has had a laryngectomy can be arranged, if surgeon has requested or approved it.

Educational materials may be obtained from the A.C.S. and the International Association of Laryngectomees, which they sponsor. A few of the other services available include transportation assistance in getting to and from treatments, home care supplies and equipment, the "Lock Good...Feel Better" program to develop skills to cope with appearance changes, and the "I Can Cope" program with information to patients and families. West Allis Memorial Hospital also offers cancer support group meetings for patients as well as their families and friends.

Postoperatively, skilled nursing intervention can help one learn the daily management of devices such as tracheostomy tubes and voice prostheses. Information is provided regarding stoma care and coverings, bathing precautions, and the need for adequate hydration and humidification, appearance and personal hygiene. Recommendations regarding making adjustments in eating, along with suggestions from the dietitian and speech therapist, are provided. There will be education regarding potential problems and the type of follow-up care required.

CANCER OF THE LARYNX AND SWALLOWING

Effects on swallowing varies according to the type of treatment required for the cancer of the larynx. Postoperatively a videofluoroscopic examination can be conducted if necessary to assess for presence and type of dysphagia.

For some there may be only some mild dysphagia shortly after surgery. Many require nothing more than reassurance or some minor changes in diet. Dysphagia may exist due to a compromise of lingual or pharyngeal function due to anatomical changes. Swallowing therapy may include changes in head positioning while swallowing, determination of consistency of food best handled or exercises to improve tongue and jaw range of motion, or improve laryngeal closure.

Tumors located on one vocal fold, and treated with a vertical or hemilaryngectomy, leaving the epiglottis intact may cause little difficulty with swallowing. Initially a head flexed posture may help protect the airway. Supraglottic tumors may be treated with a partial (horizontal or supraglottic) laryngectomy. This spares the true vocal folds, which the patient must then learn to occlude for airway protection during swallowing. Vocal fold adduction exercises can be given, and a sometimes a Teflon injection into the vocal cords considered. If the procedure is extended posteriorly to include the arytenoid cartilage, one may never be able to swallow liquids. Additional swallowing training is also required if surgery is extended up towards the base of the tongue. If a superior laryngeal nerve is sacrificed, problems could result from a decreased cough and a reduced awareness of aspiration.

Large lesions, involving more than one region, usually require a total laryngectomy. This removes the larynx (voicebox) which is involved not only in the production of speech, but also in protecting the airway. The trachea is then connected to a tracheostoma for breathing and to protect it. With the resulting physical separation of the gastrointestinal from the respiratory tract, there will be no risk of aspiration. Some prosthetic voice procedures, however, could create a risk of some aspiration.

LARYNGECTOMY AND SPEECH REHABILITATION

Both verbal and nonverbal communication allow expression of a variety of emotions. Following total laryngectomy, one is no longer able to shout, laugh, sing, attract attention or help by yelling or shouting. Speech loss is usually the most traumatizing change associated with being laryngectomized. Many appear to become more concerned about their loss of voice than their cancer diagnosis, and this also comes at a time when they need to communicate their anxieties. Acquiring any form of useful verbal communication may therefore decrease
frustration and depression. Following laryngectomy one will be unable to speak in the usual manner as there are no vocal cords to vibrate. Even larynx conservation surgery may affect the quality of speech. A partial hemilaryngectomy may result in breathlessness, harsh speech and hoarseness. A subtotal supraglottic laryngectomy also results in some hoarseness, but there is good intelligibility with both procedures. Radiation therapy can also affect quality of voice due to possible resultant stiffness of the vibratory source.

Speech rehabilitation often involves presurgical counseling. The three main methods of verbal communication following a laryngectomy are an artificial larynx, esophageal speech, or a tracheoesophageal prosthesis. Initially one can start with writing on pad or slate, or use a picture communication board. Once cleared by the surgeon for beginning speech rehabilitation, an artificial larynx may be especially helpful immediately post operatively, until sufficient voice develops for everyday speech.

Vibration can be set up from an outside source, such as an “artificial larynx” or device used to produce sounds to transmit to the vocal tract. Because the intact larynx generates undifferentiated sound, any complex sound can be put in the upper airway and molded into speech. The vowels and consonants are then formed by adjustments of the pharynx, velum, tongue, mandible and lips.

There are two main types of artificial larynx. The “mouth-type” delivers sound directly to the mouth by a short tube while the “neck-type” is designed to have the vibrating disc held against neck and resonate in the throat. This can provide an immediate voice once cleared by the surgeon.

They may be electronic (battery powered), or pneumatic (breath powered) where one end is placed over the stoma. In exhalation, air then passes over a rubber diaphragm which vibrates and generates sound that is transmitted by a flexible tube into the mouth. The careful articulation required to speak well is also helpful to learn in preparation for esophageal speech. Further speech therapy is required as one must learn the best placement, amount of coupling, timing, articulation, rate and phrasing, pitch and loudness. These methods require one hand for operation, the need to have a device available, and the speech may sound monotonous and artificial. One should be able to try various types of artificial larynx before making a selection.

Another main method of communication after laryngectomy is to trap air into the esophagus to produce sound when released. One must learn to relax the esophageal sphincter when inhaling, allowing air to be pulled into the esophagus but not swallowed into the stomach. The stoma can be covered with a finger so that air is drawn into the esophagus from pharynx. The eructation mechanism is used, which is located in the hypopharynx. Air is then expelled and sounds are then articulated orally.

Esophageal speech can be difficult to learn, taking three months or more for fluency. It lacks volume and may be difficult to use over the phones. The voice is also adversely affected when eating. It is important to relax, as anxiety, fears and eagerness to talk make speaking more difficult. Some will achieve excellent results, the majority can use it to some degree, but others are unable to learn this. First one learns sounds, then advances to words with longer syllables, phrases and sentences.

Because this requires no artificial device, many find this more desirable. It allows both hands to be free and gives a more normal appearance. Some speakers may use this as their only method of speech, while others use alternately with the electrolarynx, depending on the circumstances.

The third main method of communication is the tracheoesophageal puncture or fistula (TEP/TEF). Here there is a surgically created fistula between the rear of the trachea and the front wall of the esophagus. Various types of a silicone prosthesis can be used to stent the fistula. Fluids may leak from the pharynx or esophagus back into the trachea, risking aspiration. One problem is that a finger must be used to close the tracheal stoma to produce sound, unless wearing a tracheostoma valve. A special diaphragm can be used to keep the
airway open for respiration but will close and divert the air if exhaling with extra force.

Because these allow the use of pulmonary air for speech, rather than just small quantities of trapped esophageal air, some of the speech characteristics are better than with esophageal speech. This type of speech is highly intelligible and fluent, with normal length sentences, and increased intensity and duration. This method is easy and rapid to learn, with success reported well over 80%. To be a candidate for this, one does need sufficient motivation, cognition, vision and motor control to insert and care for the prosthesis or occlude the stoma.

A few may remain aphonic after surgery and lack ability, training or desire for artificial larynx or esophageal speech use. The Lost Chord or New Voice Clubs by American Cancer Society and the International Association of Laryngectomies are available for instruction, practice and recreation. It can be beneficial to attend these local meetings with a spouse or other family member. Group treatment and home practice with spouse and family may be helpful to improve quality of speech. The family must also learn to understand his mode of communication and not to speak for the laryngectomy patient.

Communication becomes more difficult if either the spouse or laryngectomea has impaired hearing. Even a mild hearing loss (26-40 dB) causes difficulty with understanding esophageal speech, with its decreased intensity (20 dB vs. normal 45 dB) and smaller pitch variations. "Problem listeners" are therefore taught to comprehend by speech reading or acquiring hearing aids.

**LARYNGECTOMY AND OTHER PHYSICAL FUNCTIONS**

Besides the loss of the vital functions of speech and swallowing, there can be additional problems due to need for breathing through a stoma. There is no longer the use of the nose for warmth, moisture and filtering. Humidification helps, as dry air can cause crusting around the stoma, mucous plugs and increased coughing. A stoma cover can catch any discharge from coughing or sneezing, reduce inhalation of dust or particles, and can also be used to enhance appearance.

If a radical neck surgery was required, this would sacrifice the spinal accessory nerve in order to remove all the involved lymph nodes. A flaccid paralysis with atrophy of the trapezius and sternocleidomastoid muscles occurs. One may then experience subluxation of the shoulder joint or shoulder pain. This may require early support, then progressive range of motion and strengthening exercises for the remaining normally innervated muscles. Cervical range of motion exercises can prevent deviation of spine to the other side. There may be loss of sensation to skin of lower scalp, top of shoulder and around ear, with increased risk of sunburn or frostbite.

There may be a decrease in stamina, which along with inability to perform adequate valsalva maneuver, limits ability to perform strenuous physical work. This could be due to physical limitations in thoracic fixation for lifting, or one may tire more easily or become breathless more quickly. A physical or occupational therapist could provide one with a series of exercises to improve function.

Since one can not inhale through the nose, sense of smell is reduced or lost, resulting in a decreased taste. Learning buccopharyngeal, as well as respiratory muscle sniffing may improve sense of smell.

Many laryngectomy patients have other coexistent conditions such as COPD, heart disease, diabetes, hypertension, degenerative joint diseases, malnutrition or other problems. Some have additional problems related to previous heavy use of tobacco or alcohol and may also require treatment for this. Rehabilitation can also include pain control if necessary through methods such as biofeedback, hypnosis.

**PSYCHOSOCIAL ASPECTS OF LARYNGECTOMY REHABILITATION**

Upon learning of the diagnosis of cancer, there is fear of cancer spread and death. Responses to this are variable and there may be more concern about the loss of speech. Ensuing shock, depression and anxiety are common...
emotions. Cancer surgery is a major surgery, often leading to functional impairment. Successful adjustment depends on many factors, including the background of the individual, support of family and friends, and the quality of rehabilitation services offered.

Although significant stress is imposed on the family, most marriages tend to remain as stable as those without laryngectomy. Adjustment to the spouse’s voice and decrease in overall communication was often more difficult than expected. Some have had reported an alteration in sexual function, due in part to the stoma, as well as to effects of other treatments such as radiation and chemotherapy.

Following surgery, one may alter the choice of social activities and the poor speakers tend to be more socially withdrawn. There may be a loss of friends who are hard of hearing or enjoy strenuous sports. Some never get outside of the home and may even have no hobbies. One may feel embarrassed, frustrated and inferior due to physical changes, such as having a hole in the neck for breathing.

Many of the psychological effects are in fact results of social implications of a disability. The voice serves many functions, providing communication and expression of emotions and allowing gratification with mastery of situations. Post-operative feelings of isolation and body image problems can each contribute to depression. Any form of communication lessens depression. Those who develop functional speech have higher levels of employment, participate more in social activities and community organizations and have greater chance of returning to work.

Psychological factors important in rehabilitation include motivation, depression sensitivity, anxiety and seclusion or withdrawal. Depression differs from the normal grief reaction, where self-esteem is not affected and the focus is on the lost object. Frequently depression is related to loss of speech and diminishes with compensation for lost vocal function. Untreated depression and poor motivation is a common state in rehabilitation failures and inability to acquire speech.

**VOCATIONAL REHABILITATION AND ECONOMIC ISSUES**

Financial issues can be discussed with discharge planners and social workers. There is frequently a concern about ability to maintain economic and vocational independence. There may be job loss, or employment with less prestige, income or ego satisfaction.

There is an average of about five months loss of work, while some do not return to work. Taking early retirement in the mid-50’s is not infrequent. This is sometimes related to difficulties with breathing through the stoma and the need to avoid dust, fumes and sprays, or to speech disabilities in jobs such as teaching, law, and construction. Having intelligible speech was a major factor in employment, and the desire to return to work was a motivating factor to learn speech as well.

Cancer is a life threatening disease, but one which frequently leaves a person capable of working. There is concern for employment discrimination which is difficult to prove. Employers may fear prolonged sick periods, with increased costs for insurance, pensions and fringe benefit plans.

The Americans with Disabilities Act has the potential to prevent unfair employment discrimination. It requires hiring and promoting of qualified candidates with a disability, and making “reasonable accommodations” at work. A vocational counselor can assist with determining possible job modifications. If one is unable to meet the previous job requirements, they may be eligible to retrain through state Vocational Rehabilitation agencies.

Following laryngectomy, there may be other changes required in daily activities or avocations. There may be little pleasure in attending dinner parties due to difficulties with speaking while eating and drinking. There may be problems in interaction with those who have hearing losses or in noisy environments. One may sometimes be unable to cut grass or shovel snow due to dust and dry or cold air. There may be restrictions for strenuous sports.
due to reduced strength or endurance. With a tracheostoma one should avoid water sports without proper training and protective equipment, due to risk of water getting in stoma and lungs. Caution with fishing and boating is also required. There may be termination of hobbies creating dust or fumes, or an inability to pursue singing, wind instruments, or acting.

CONCLUSIONS

Prevention of further disability is ideal, therefore rehabilitation begins at the time of diagnosis, with continued efforts throughout for maximum restoration of function. Information and support for family, spouse and friends is related to positive rehabilitation outcomes such as improved speech and functioning, as well as decreased depression. Achieving optimal functional levels includes not only physical restoration, but optimizing social and vocational functioning, and emotional well-being.

There is a unique nature of the loss of voice, with its additional psychological, social and economic implications. Restoring optimal function in those treated for laryngeal tumors is important in rehabilitation. Signs of successful rehabilitation include effective communication regardless of the method, a return to a life-style equivalent in satisfaction to the preoperative condition, and adequate psychological adjustment to the disability. The majority do make a good overall adjustment and distant laryngectomies in general have better adjustment than those recently operated. There was no significant differences in adjustment among the three major speech groups (esophageal, TEP or artificial larynx).

Rehabilitation can occur in a variety of settings, such as inpatient, outpatient and home therapy, as well as in hospice and skilled nursing facilities if required. True rehabilitation is not limited to the person with cancer but may encompass education of the patient's family and employers as well.

There is currently an increasing incidence of tumors of the larynx, along with a more frequent good long-term prognosis. With advances in medical care, the majority are living a good number of years. Although the quantity of survival is increasing, one could pay a price in quality issues, due to disabilities resulting from cancer treatment side effects. A better quality of survival can be achieved through a coordinated rehabilitation program. For further information on this topic or related issues, please contact me or any of the members of the Rehabilitation Services Department at West Allis Memorial Hospital.
PATIENT CARE EVALUATION STUDIES OF THE LARYNX AND HYPOPHARYNX

Hospital Participation

In 1994 our hospital participated in the Commission on Cancer's studies of laryngeal and hypopharyngeal cancers. Our hospital was among 723 hospitals that contributed 11,407 cases for the short-term (1992) study, and 519 hospitals that contributed 8,554 cases for the long-term (1985) survival study.

Purpose of the Studies

The purposes of the studies are to document current methods of diagnosis, staging and treatment of the larynx and hypopharyngeal cancers. The survival study will assess the results of treatment.

Eligibility

Patients entered in the studies must meet the following criteria:

Cancer must be a histologically confirmed primary of the larynx or hypopharynx.

Patients must either be first diagnosed and treated at WAMH, or had their first course of therapy initiated at WAMH. Also included are those patients for whom no treatment was the treatment of choice.

Excluded are those patients diagnosed at WAMH who received their first course of therapy at another facility and those diagnosed at autopsy.

Only epithelial carcinomas of the larynx and hypopharynx were eligible to be included in the studies.

Each study includes 25 consecutive cases accessioned in both 1985 and 1992.

Comparative Results

When compared with the other hospitals, WAMH patients were older at the time of diagnosis in the majority of the cases. This is a disease of patients in the 60 to 79 age range.

The sex ratio is predominantly male. WAMH figures all reflect this. Males account for over 70 to 84 percent of the incidence of these cancers. These percentages are reflected in the national figures as well.

Risk Factors

Whether the patient had ever smoked or was a current smoker was recorded as yes. The graph on the next page demonstrates that the overwhelming majority of patients from WAMH had a history of smoking. This fact was also present in the data from the other hospitals.

Both the 1985 and 1990 WAMH study results have shown that 32 percent of the patients reported a weekly alcohol consumption of at least 21 drinks or more. What is not apparent in the WAMH study results is the fact that many patients had a history of ETOH abuse but at the time of diagnosis were not drinking. This information was not requested in the studies so these facts are not indicated in the data.

As shown in the national data results there was a high percentage of unknown weekly alcohol consumption, while the WAMH percentage of unknown was relatively small. This would seem to indicate that more complete documentation was present in the medical records at WAMH.
LARYNGEAL AND HYPOPHARYNX CANCER STUDIES

PATIENT AGE

AGE RANGE

LARYNGEAL AND HYPOPHARYNX CANCER STUDIES

SEX RATIO

WAMH - 1985
- MALE 84%
- FEMALE 16%

WAMH - 1990
- MALE 72%
- FEMALE 28%

ALL HOSPITALS - 1985
- MALE 80%
- FEMALE 20%

ALL HOSPITALS - 1990
- MALE 76%
- FEMALE 24%
### WEEKLY ALCOHOL CONSUMPTION*

<table>
<thead>
<tr>
<th>NUMBER OF DRINKS</th>
<th>WEST ALLIS MEMORIAL HOSPITAL</th>
<th>ALL OTHER HOSPITALS</th>
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<tr>
<td>WEEKLY AMT.</td>
<td>1985 STUDY</td>
<td>1990 STUDY</td>
</tr>
<tr>
<td>NONE</td>
<td>10 (40%)</td>
<td>15 (60%)</td>
</tr>
<tr>
<td>1 - 3</td>
<td>2 (8%)</td>
<td>- O -</td>
</tr>
<tr>
<td>4 - 6</td>
<td>- O -</td>
<td>- O -</td>
</tr>
<tr>
<td>7 - 13</td>
<td>1 (4%)</td>
<td>- O -</td>
</tr>
<tr>
<td>14 - 20</td>
<td>1 (4%)</td>
<td>- O -</td>
</tr>
<tr>
<td>21 - 27</td>
<td>2 (8%)</td>
<td>3 (12%)</td>
</tr>
<tr>
<td>28 - &gt;</td>
<td>6 (24%)</td>
<td>5 (20%)</td>
</tr>
<tr>
<td>UNKNOWN</td>
<td>3 (12%)</td>
<td>2 (8%)</td>
</tr>
<tr>
<td>OTHER</td>
<td>- O -</td>
<td>- O -</td>
</tr>
<tr>
<td>TOTALS</td>
<td>25 (100%)</td>
<td>25 (100%)</td>
</tr>
</tbody>
</table>

* These results do not take into account those patients with a history weekly alcohol consumption.

### PATIENT SMOKING HISTORY

- **WAMH - 1985**: Yes 96%, Unknown 4%
- **WAMH - 1990**: Yes 88%, No Never 12%
- **ALL HOSPITALS - 1985**: Yes 81%, Other 14%
- **ALL HOSPITALS - 1990**: Yes 88%, No Never 8%
**First Course of Therapy**

The graph above shows an increase, in 1990, of 25 percent in the use of radiation therapy for treatment of cancer of the larynx and a decrease of 25 percent in the use of surgical resection. Twenty-five percent of the patients received a combination of surgery and radiation therapy for laryngeal cancer in 1990.

The treatment for cancer of the hypopharynx remained relatively unchanged when comparing the 1985 and 1990 data. It is interesting to note that, in 1985, 20 percent of the patients with hypopharyngeal cancer received chemotherapy which coincided with 20 percent of the patients with stage IV cancer. In 1990, 60 percent of the patients had stage IV cancer of the hypopharynx and none were treated with chemotherapy.

**Symptoms Present at Diagnosis**

It is interesting to note that there are relatively few symptoms present at the time of diagnosis for laryngeal cancer when compared to hypopharyngeal cancer and yet laryngeal cancer is diagnosed at an earlier stage than hypopharyngeal cancer. The results are essentially the same when WAMH is compared to the national results. The main symptom present in laryngeal cancer is hoarseness while the main symptoms present at diagnosis in hypopharyngeal cancer are dysphagia, neck mass, and sore throat.

**Survival**

When comparing the survival graphs for both hypopharyngeal and laryngeal cancer WAMH survival results compared favorably with the national results.
HYPOPHARYNX CANCER STUDIES
SYMPTOMS PRESENT AT DIAGNOSIS

PERCENT

HYPOPHARYNGEAL CANCER STUDIES
CLINICAL AJCC TNM STAGE

WEST ALLIS MEMORIAL

28
HYPOPHARYNGEAL CANCER STUDIES
FIVE YEAR LONG-TERM SURVIVAL

<table>
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<tr>
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<th>&lt;1 YR</th>
<th>1-&lt;2 YR</th>
<th>2-&lt;3 YR</th>
<th>3-&lt;4 YR</th>
<th>4-&lt;5 YR</th>
<th>5&gt;YR</th>
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<tbody>
<tr>
<td>WAMH</td>
<td>80</td>
<td>57.1</td>
<td>57.1</td>
<td>57.1</td>
<td>57.1</td>
<td>19</td>
</tr>
<tr>
<td>ALL HOSPITALS</td>
<td>69.1</td>
<td>49</td>
<td>38.9</td>
<td>34.6</td>
<td>33.1</td>
<td>28.6</td>
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LARYNGEAL CANCER STUDIES
FIVE YEAR LONG-TERM SURVIVAL

<table>
<thead>
<tr>
<th></th>
<th>&lt;1 YR</th>
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<th>2-&lt;3 YR</th>
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<th>4-&lt;5 YR</th>
<th>5&gt;YR</th>
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</thead>
<tbody>
<tr>
<td>WAMH</td>
<td>94.6</td>
<td>76.9</td>
<td>76.9</td>
<td>76.9</td>
<td>76.9</td>
<td>76.9</td>
</tr>
<tr>
<td>ALL HOSPITALS</td>
<td>91.5</td>
<td>83.5</td>
<td>79.2</td>
<td>76.6</td>
<td>74.7</td>
<td>59.7</td>
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## Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Accessioned</td>
<td>Entered into the Cancer Registry database</td>
</tr>
<tr>
<td>ACoS</td>
<td>American College of Surgeons - In 1932 the American Cancer Society urged the American College of Surgeons to take the lead in setting guidelines for cancer care. Approval of hospital-based cancer programs has been the foundation for improving the quality of care of patients with cancer.</td>
</tr>
<tr>
<td>ACS</td>
<td>American Cancer Society</td>
</tr>
<tr>
<td>AJCC</td>
<td>American Joint Committee on Cancer - organized for cancer staging and end results reporting</td>
</tr>
<tr>
<td>First Course of Therapy</td>
<td>First course of therapy is treatment planned and/or administered within the first four months following cancer diagnosis in order to modify, control, remove or destroy proliferating cancer tissue.</td>
</tr>
<tr>
<td>PCE's</td>
<td>Patient care evaluation studies - Evaluation of cancer patient care through the process of problem identification, problem analysis, action planning and follow-up monitoring.</td>
</tr>
<tr>
<td>Stage of Disease</td>
<td>The extent of disease determined at the time of initial workup for the first course of treatment</td>
</tr>
<tr>
<td>Subsequent Therapy</td>
<td>Change in treatment due to apparent failure of the original, planned or administered treatment or because of progression of disease, such treatment is excluded from the first course of therapy.</td>
</tr>
<tr>
<td>TNM Staging</td>
<td>AJCC classification to determine the extent of disease at the time of diagnostic workup for the first course of treatment &lt;br&gt;<strong>T</strong> - Size of tumor  &lt;br&gt;<strong>N</strong> - Lymph node involvement  &lt;br&gt;<strong>M</strong> - Metastasis at distant sites</td>
</tr>
</tbody>
</table>
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