Non-Hodgkin’s lymphoma (NHL) is predicted to be the sixth most common type of cancer in both men and women in the United States in 2010. NHL encompasses a wide variety of disease subtypes for which incidence patterns vary. The overall incidence has been stable since 1991 in men, but has been increasing by 1.1% per year since 1990 in women. In 2010 it will account for approximately 4% of all cancer cases. It is predicted that NHL will be the eighth leading cause of cancer death in American men and the sixth leading cause of cancer death in American women. In this report, we will analyze the patient and treatment characteristics of the cases of Non-Hodgkin’s lymphoma seen at Avera Queen of Peace Hospital.

The risk of developing NHL, like most cancers, increases significantly with age. Risk also increases in persons with various conditions associated with altered immune function as well as certain occupational or environmental exposures. According to the National Cancer Data Base (NCDB), Midwest Division, from 2000 to 2007 approximately 74% of Non-Hodgkin’s lymphoma patients were above the age of 59 at the time of diagnosis. In the Avera Queen of Peace Cancer Registry Database from 2001-2009, approximately 89% of cases were in the over 59 age range when diagnosed (see graph 1).

While it is generally found in the NCDB that males are at a slightly greater risk of developing non-Hodgkin’s lymphoma than females, the number of females entered into the Avera Queen of Peace Cancer Registry database from 2001-2009 exceeded the number of males entered by 12% (see graph 2).

The clinical presentation of NHL varies tremendously depending upon the type of lymphoma and the areas of involvement. Some NHLs behave indolently with lymphadenopathy waxing and waning over years. Others are highly aggressive, resulting in death within weeks if left untreated. In typical cases:

- **Aggressive lymphomas** commonly present acutely or subacutely with a rapidly growing mass, systemic B symptoms (fever, night sweats, weight loss) and/or elevated levels of lactate dehydrogenase and uric acid. Examples of lymphomas with this aggressive or highly aggressive presentation include diffuse large B cell lymphoma, Burkitt lymphoma, adult T cell lymphoma/leukemia, and precursor B and T lymphomoblastic leukemia/lymphoma. Diffuse large cell lymphoma is the most common single histological subtype of NHL at Avera Queen of Peace as well as in the NCDB Midwest Division.

- **Indolent lymphomas** are often insidious, presenting only with slow growing lymphadenopathy, hepatomegaly, splenomegaly, or cytopenias. Examples of lymphomas with this indolent presentation include follicular lymphoma, chronic lymphocytic leukemia/small lymphocytic lymphoma, and splenic marginal zone lymphoma. Follicular lymphoma is the second most common type of NHL in the Avera Queen of Peace cancer registry database at 21%. For most patients with stage I or II follicular lymphoma, treatment is with radiation therapy rather than chemotherapy or an initial period of observation. This is principally based upon the observation that some patients may be cured with radiation. Patients that present with advanced stage (III or IV) follicular lymphoma are usually not curable with conventional treatment. Thus, in contrast to patients with curable aggressive lymphoma, the major indication for treatment is alleviation of symptoms. Clear indications for treatment include:
  - Local symptoms due to progressive or bulky nodal disease.
  - Compromise of normal organ function due to progressive or bulky disease.
  - Presence of systemic B symptoms (fever, weight loss, night sweats)
  - Presence of symptomatic extranodal disease, such as effusions.
  - Cytopenias due to extensive bone marrow infiltration, autoimmune hemolytic anemia or thrombocytopenia, or hypersplenism.

The NCDB, from 2000 to 2007 showed that 18.54% of the NHL cases were diagnosed at stage I compared to 30.77% of the cases in the Avera Queen of Peace Cancer Registry. Stage I refers to NHL involving a single lymph node region or a single extralymphatic organ or site. The percentage of patients being diagnosed with stage II and III disease was slightly higher at Avera Queen of Peace, however.
the NCBD was at 36.11% for the stage being unknown at the time of diagnosis compared to 6.41% at Avera Queen of Peace. Stage II refers to two or more involved lymph node regions on the same side of the diaphragm or with localized involvement of an extralymphatic organ or site. Stage III refers to lymph node involvement on both sides of the diaphragm or with localized involvement of an extralymphatic organ or site or spleen, or both. The percentage of patients being diagnosed at stage IV disease was very comparable between the two databases with the NCDB at 22.44% and Avera Queen of Peace at 24.36% (see table 1). Stage IV refers to the presence of diffuse or disseminated involvement of one or more extralymphatic organs (liver, bone marrow, lung), with or without associated lymph node involvement. Overall, the proportion of cases having extra-nodal presentations appeared similar in our database to that seen in larger databases at 24.36% and 28.79% respectively (see table 2).

In general, treatment for the cases of non-Hodgkin’s lymphoma abstracted at Avera Queen of Peace Hospital from 2001-2009 was consistent with that recommended in national treatment guidelines. Non-Hodgkin lymphoma patients at Avera Queen of Peace are usually treated with chemotherapy alone (33.33%). Radiation, alone or in combination with chemotherapy is used less often – approximately 13% of patients were treated with radiation and chemotherapy and only 6% were treated with radiation only (see table 3).

### The Role of Chemotherapy in NHL

Diffuse large cell lymphoma is the most common type of aggressive lymphoma. Primary therapy consists of CHOP with Rituximab for six cycles. A shorter course of chemotherapy may be used for localized (early stage) disease when combined with involved field radiation depending on the disease location. A patient with advanced disease and a high risk of relapse may be a candidate for additional therapy such as high dose chemotherapy with autologous stem cell rescue.

Treatment options for advanced stage follicular lymphoma typically is to administer cyclophosphamide, vincristine, and prednisone plus rituximab (R-CVP) because of its favorable side effect profile. Other acceptable regimens include R-CHOP, fludarabine pluse rituximab (FR), and Fludarabine, mitoxantrone, and dexamethasone plus rituximab (R-FMD). For patients who receive chemotherapy alone for the initial treatment of follicular lymphoma, it is recommended to administer a subsequent course of maintenance rituximab.

### The Role of Radiotherapy in NHL

The role of radiotherapy depends on the histology of disease, stage of disease, and on the patient’s overall health. The use of radiotherapy has been modified and even eliminated for certain types of NHLs due to improvements in chemotherapy regimens. Certain organs affected by NHL, such as the eye, are often successfully treated with radiation therapy alone.

Improvements in the administration of radiotherapy for NHL have greatly benefited patients. Intensity modulated radiotherapy enables the physician to precisely target the tumor regardless of its size and shape while significantly reducing the radiation dose to nearby organs and tissues. Involved field radiotherapy which treats the involved nodal region with adequate margins or an extranodal site and its immediate lymph node drainage area is commonly used in the treatment of localized lymphomas. The treatment of reduced fields has further decreased the incidence and severity of radiation therapy side effects.

Clinical trials have shown that radiation therapy can be a valuable adjunct in the treatment of diffuse large B-cell lymphoma when the disease affects limited areas of the body. Radiotherapy can be delivered after three to eight cycles of chemotherapy to eradicate any residual disease. The doses typically used in consolidative radiotherapy are in the range of 30 to 40 Gy delivered over a two to four week period. The radiation doses may be increased for intermediate high grade lymphomas, especially the diffuse large cell type. Radiotherapy may be used in cases of large tumor burden or in patients who have had a suboptimal response to chemotherapy to reduce tumor bulk and to relieve symptoms due to compression or obstruction of other structures and organs.

Radiation therapy is commonly used in patients with stage I and II follicular lymphomas. The overall survival rate at five years for early stage follicular lymphoma treated with radiation therapy alone is 80% to 100%. Treatment of advanced stage follicular lymphomas is often deferred until the patient becomes symptomatic.
On April 21, 2009, Avera received $13.5 million from The Leona M. and Harry B. Helmsley Charitable Trust; over $2 million was designated to fund low and high dose rate Brachytherapy at the Avera Queen of Peace Cancer Center in Mitchell. The grant also covered the cost of remodeling the Cancer Center, specifically the dosimetry area, linear accelerator room and the examination rooms. The addition of Brachytherapy allows Avera Queen of Peace to provide the most advanced technology available for cancer detection and treatment to the people in our 19 county service area. Many people were involved in the grant process at Avera Queen of Peace, but the real heroes are our employees! Avera Queen of Peace received funding for Brachytherapy in recognition of the exceptional care we provide to our patients. Our reputation for excellence resulted in this generous gift which will allow us to continue our mission of delivering the best care possible, close to home.

Introducing Brachytherapy to the Mitchell Region

- Brachytherapy is new at the Cancer Center this year; it is a time-efficient, accurate, effective and economical way to treat many forms of cancer.
- Brachytherapy is derived from Greek words, “brachy” meaning for short distance and “therapy” meaning treatment. Low-dose rate Brachytherapy is the permanent implantation of radioactive seeds in or next to cancerous tissue. High-dose rate Brachytherapy is a temporary implant by which treatment is administered via a removable catheter connected to a radioactive source.
- The advantages of Brachytherapy include shorter treatment times and fewer side effects because the radiation is targeted to a more specific area. For example, a breast cancer patient could be treated with high-dose rate Brachytherapy over a period of five days compared to standard radiation therapy practices which gives the breast treatment over six to seven weeks. Prostate cancer could be treated with low-dose rate Brachytherapy in a single out-patient surgical procedure. External beam radiotherapy for the same cancer would entail daily radiation treatments for up to two and half months. Prostate cancer patients treated with Brachytherapy could expect to have fewer side effects including lower incidence of incontinence and impotence.
- Brachytherapy can be used alone or in combination with other treatments such as hormonal therapy, chemotherapy, surgery, or external beam radiotherapy. Brachytherapy may be used to treat prostate, breast, head and neck, skin, and cervical or other gynecologic cancers, and is most effective when the cancer is detected early.
Avera Queen of Peace Hospitality House

Are you or someone you love in need of a home-away-from-home while receiving medical care at Avera Queen of Peace?

The Avera Queen of Peace Hospitality House, located at 600 East Sixth Avenue in Mitchell, offers affordable, temporary housing with a comfortable, home-like atmosphere for patients and caregivers. Located near the Avera Queen of Peace Cancer Center and the Hospital, the House enables individuals to stay in Mitchell and receive the care they need, without the worry and burden of traveling. **The facility is especially intended to help patients who are receiving cancer treatment; however, it is also available for those scheduled for same-day surgery, and patients using other ongoing hospital services.** The families of residents at Avera Brady Health and Rehab and Avera Brady Assisted Living are also eligible to stay at the House, if rooms are available. A referral form from the Cancer Center, Hospital or Avera Brady is required. For more information about the Hospitality House or to schedule a tour, please call 605-995-2466.

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**Educational Art Classes**

The Avera Queen of Peace Cancer Center hosted a series of six instructional and educational Art Classes for individuals who have been affected by a cancer diagnosis, including cancer survivors, family members, health care workers, and friends. The classes are part of the “Oncology on Canvas” program which was conceived by Lilly Oncology as a way to honor the journey of those whose lives have been affected by cancer. Classes were intended to help people affected by cancer express themselves and relieve some of the stress associated with the impact of a cancer diagnosis. The program was provided under the instructional guidance of local artists Lelia Gilbert, David Cantrell, and Sandy Krage.

In addition to instruction and education, the Oncology on Canvas Art Classes gave participants an opportunity to share their concerns with others who might be having similar experiences and to discuss ways to cope with the challenges of a cancer diagnosis. A variety of mediums were available for participants including sketchbook drawing, acrylic paints, collage and photography, oil paints, and watercolors. Nine participants submitted pieces of their work to the Lilly Oncology Art Competition.

**“Get Fit While You Sit!”**

The Avera Queen of Peace Cancer Center and the Avera Queen of Peace Wellness Center sponsors “Get Fit While You Sit!”, a 30-minute class for the general public and for cancer patients and their families. Each session meets for eight weeks several times during the year in the lobby of the Cancer Center. The program has been successful because the group approach to exercise is good for the morale and encouragement of folks with cancer and their families. There’s no charge for the class and all are welcome. Cindy Riddle, fitness instructor, leads the classes with assistance from other Avera Queen of Peace Wellness Center instructors. According to the American Cancer Society, cancer treatment can cause fatigue which exercise can help combat. In addition, cancer treatment can reduce the ability of the immune system and exercise is advised to help boost the immune system. Cancer can also increase the risk of cardiovascular disease, osteoporosis, diabetes, and other conditions. Exercising can help reduce the risks of these conditions. Finally, exercise helps increase range of motion, and the ability to perform activities of daily living; and, in general, improves an individual’s quality of life.
What is the Cancer Registry?

The Cancer Registry is designed to collect information about the occurrence (incidence) of cancer, the types of cancers that occur and their locations within the body, the extent of cancer at the time of diagnosis (stage), and the treatments that patients receive. This data is reported to a central statewide registry (SDCR) as well as the National Cancer Database (NCDB). The data collected and reported is used to support research (including those aimed at evaluating the effectiveness of cancer prevention, control and treatment programs), track trends, initiate epidemiologic studies and provide data for allocation services.

From January 1, 2001, thru December 31, 2009, there were 2,079 cases entered into the Avera Queen of Peace Cancer Registry database, with an average annual caseload of 231 cases. In 2009, a total of 235 cases were entered into the database. More than 66% of the patients entered in the Avera Queen Peace Cancer Registry database reside outside of Davison County. For 2009, 21 counties in South Dakota were represented in the Cancer Registry database.

Most Common Cancers:

In 2009, the five most common cancers in the Avera Queen of Peace Cancer Registry in order of frequency were breast, lung, colorectal, prostate and bladder. Our cancer incidence rates for the most common cancers are comparable to the national rates predicted by the American Cancer Society for 2009. Avera Queen of Peace did show a slightly higher percentage of breast, lung and colorectal cases while showing a slightly lower percentage for prostate cases when compared to national estimates (see graph 1).
Gender/Age Distribution:

Distribution of cases by gender revealed 54% females and 46% males. The ages ranged from 22-100 with the mean age at diagnosis being 69. The most common age group at diagnosis for both men and women was 70-79 (see graph 2).

Stage/Site:

The majority of breast, colorectal, prostate and bladder cancers were diagnosed at early stages (Stage 0-II). The lung cancers were most commonly diagnosed at Stage III-IV (67%).

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*Cancer Site Distribution Summary – 2009

*Excludes carcinoma in situ of the Cervix
Our oncology program has been recognized by the Commission on Cancer of the American College of Surgeons as offering the very best in Cancer Care.

This certification recognizes the quality of our comprehensive, multidisciplinary patient care.

www.AveraQueenofPeace.org

For more information about cancer care services, including high dose and low dose brachytherapy, and all services available at Avera Queen of Peace, visit our website and select the “Our Services” link.