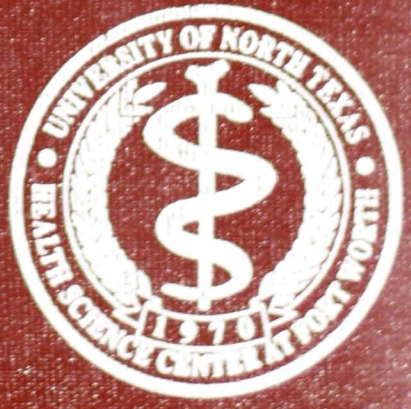
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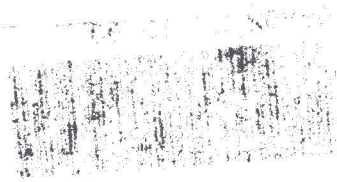

Oliva, Sonnia B., Radiation Treatments In Women Suffering From Advanced Breast Or Cervical Cancer Pain: Is It Underutilized For Palliation? Doctor of Public Health (Social and Behavioral Sciences), May 2005, 43 pp., 3 tables, 4 figures, references, 39 titles.

The research is to study if radiation treatments are under-utilized in metastatic breast and cervical cancer for palliative therapy and to explore the usage of various radiation-therapy modalities that are currently being used for women with these diagnoses. Studies indicate that radiation treatments specifically external beam radiation and radiopharmaceutical therapy for painful metastatic bone disease are the most effective at relieving bone pain.

Studies find that breast cancer is known to be a cancer associated with bone metastasis, and literature review supports the conclusion that cervical cancer may also present with bone metastasis. The literature review includes the pervasiveness of pain suffering, issues surrounding why it is so difficult to treat pain, how cancer causes pain, and past study results of radiation effectiveness for bone metastases.

The study population is secondary data attained from the Surveillance Epidemiology and End Results (SEER) Program and included women 65 years of age and older with Stage IV breast or cervix uteri cancers. The total sample analyzed included 6,505 breast cancer cases and 758 cervix uteri cancer cases.

Logistic regression of data found that women with Stage IV breast cancer compared to women with a diagnosis of Stage IIIB breast cancer are 30% less likely to

have radiation with a p-value of less than .001. A diagnosis of cervix uteri cancer of Stage IV was also found to be significant with a women being 57% less likely to have radiation compared to a diagnosis of Stage IIIB cervix uteri cancer.

The results of this study support the underutilization of radiation in Stage IV breast and cervical cancers for palliative purposes. The World Health Organization's model of resource allocation in cancer care recommended palliative, symptom-modifying therapy simultaneously with disease-modifying therapy. In summary, this study provides the first known population-based data on radiation utilization of invasive breast and cervix uteri cancers controlling for age, martial status and race/ethnicity in the United States.

RADIATION TREATMENTS IN WOMEN SUFFERING FROM

ADVANCED BREAST OR CERVICAL CANCER PAIN:

IS IT UNDERUTILIZED FOR PALLIATION?

Sonnia B. Oliva, B.S.N., M.B.A

APPROVED:

Major Professor

Committee Member

Committee Member

Department Chair

Dean, School of Public Health

# RADIATION TREATMENTS IN WOMEN SUFFERING FROM ADVANCED BREAST OR CERVICAL CANCER PAIN: IS IT UNDERUTILIZED FOR PALLIATION?

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Presented to the School of Public Health

University of North Texas
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By

Sonnia B. Oliva, B.S.N., M.B.A

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# CHAPTER I

## INTRODUCTION TO STUDY

Many patients in the United States needlessly suffer from pain because they do not receive effective treatment. Extensive research in pain management is needed to address more effective treatments, access to information and quality palliative care affected individuals. Professionals that deal with patients who experience chronic pain need to have (1) a strong knowledge in assessing pain and the various treatments for pain, and (2) understand what may be the social barriers for ineffective pain management.

The research is to study if radiation treatments are used in metastatic breast and cervical cancer for palliative therapy. The study will analyze secondary data from the Surveillance, Epidemiology and End Results (SEER) data base. Palliative therapy as indicated in the SEER data may also be part of the first course of therapy if it is used to destroy or modify cancer tissue to relieve suffering or improve quality of life. (Johnson, 2004) The SEER database compiles "information on more than 3 million in situ and invasive cancer cases … and approximately 170,000 new cases are added each year within the SEER coverage areas" (National Cancer Institute [NCI], n.d.).

The SEER Program is comprised of 14 population-based cancer registries and three supplemental registries that collect data on patient demographics, primary tumor size, morphology, stage at diagnosis, first course of treatment and follow-up for vital

status (NCI, n.d.). This program "is the only comprehensive source of population-based information in the United States that include stage of cancer at the time of diagnosis and survival rates within each stage" (NCI, n.d.).

This large data base can assist in providing a greater predictive power for end-of-life care outcomes, especially as it relates to pain management. The population covered by SEER is comparable to the general US population with regard to measures of poverty and education; however, it tends to be somewhat more urban and has a higher proportion of foreign-born persons than the general US population (NCI, n.d.).

Analysis of the SEER data of breast and cervical cancer among women, especially with research showing that there are still women being diagnosed at advance stages can provide important information concerning whether or not all interventions are being used to help in controlling the severe level of pain that often is associated with cancer. The analysis can show if the treatment of radiation is being recommended and what type is being used for women with a diagnosis of metastatic breast or cervical cancers and if radiation treatment is being recommended, but the patient is refusing. Either outcome may provide health and medical professionals with relevant information on models of clinical teaching that must be developed to improve pain management.

## Background

Greater predictive power for end-of-life care outcomes is needed if professionals are to develop evidence-based outcome measures in the palliative care of the seriously ill or dying patient, specifically in pain management. Pain management is among one area that is poorly managed for all individuals suffering with chronic pain. "Women in general

are one group that is more likely to be under treated," says Amy Niles, President of the National Women's Health Resource Center (Pain Management, 2003). According to Anderson et al. (2002) "42% of patients with recurrent or metastatic carcinoma and pain are treated inadequately for their pain" (p. 2295).

A report, *Approaching Death: Improving Care at the End of Life,* released by the Institute of Medicine (IOM) in 1997 reported "gaps in the provision of care for those at end of life and the need for attention from clinicians and scientists, including biomedical, social sciences and health service researchers" (Paice, Muir & Shott, 2004, p. 19). Two reasons cited by the report concerning inadequate end-of-life care included the lack of data regarding quality of care provided to the dying and a lack of accountability for providing excellent care (Paice, Muir & Shott, 2004).

Evidenced-based practices for palliative care require considerable work. As noted in a Hospice and Palliative Nurses Association position's paper (2004) "evidence-based palliative care is more often the exception rather than the rule" (Cliff, Harte, Kirschling & Owens, p. 191). The report released in 1997 by the IOM, recommended specific attention to management of pain and appropriate referrals to palliative and hospice care as a provision of quality care for end-of-life care (Paice, Muir, & Shott, 2004).

Recently the National Cancer Policy Board (NCPB) in collaboration with the IOM released *Improving Palliative Care for Cancer.* In this report the NCPB and IOM asserted the need for both curative treatments and palliative care in varying degrees relating to the course of the illness (Paice, Muir, & Shott, 2004).

Future research in cancer prevention and arresting the progression of cancer is vital, but consideration must also be given to eliminating the suffering at end-of-life from cancer. In an Annual Report to the Nation on the Status of Cancer, 1975-2001, the authors point out that "disparities in access to and quality of care have been documented throughout the cancer spectrum" (Jemal et al., 2004, p.22), and recommended the "development and use of evidenced-based guidelines for all aspects of cancer care" (Jemal et al., 2004, p. 23).

## Statement of the Problem

The topic to which this study is directed towards is to examine what radiation therapies for palliation is being used for women 65 years of age and older with metastatic breast and cervical cancer. Numerous studies contend that cancer pain and pain management of other etiologies is under treated. Anderson et al. (2000) cites, "data from a recent national study defined the prevalence and severity of pain in cancer outpatients and documented significant undertreatment of pain" (p. 1929).

One aspect of cancer staging is determining to what degree a tumor has spread. "Tumor spread throughout the body can take several forms: (1) direct invasion of contiguous organs or local spread; (2) metastases to distant organs by lymphatics and veins; and (3) metastases by implantation" (McCance & Huether, 1998, p.350). In advanced cancer "bone metastases are often the first presentation of distant disease ... especially prostate, breast and lung cancer" (Kucuk et al., 2000, p. 239).

Pain associated with bone metastases is often difficult to manage. Janjan (1997) notes that "metastatic disease represents >40% of oncologic practice, and >70% of

patients with metastatic disease have uncontrolled cancer-related pain" (p. 1628). Studies indicate that radiation treatments specifically external beam radiation and radiopharmaceutical therapy for painful metastatic bone disease are the most effective at relieving pain. However a survey conducted among medical oncologist, found that oncologist gave an overall low appropriateness rating for radiopharmaceutical therapy as a palliative intervention option for metastatic bone pain (Smith, Navani & Fishman, 2004).

Although research supports both radiation modalities as effective pain management interventions there is no study that documents descriptive statistics of how often it is being used for advance cancers and what factors are associated with its use. Studies find that breast cancer is known to be a cancer associated with bone metastasis, and literature review supports the conclusion that cervical cancer may also present with bone metastasis. Therefore, the research criterion limits the use and types of radiation to only these diagnoses.

## Purpose of the Study

The purpose of this study is to provide statistical data of the utilization of radiation modalities and factors that are associated with its use. Knowledge from this study can provide the following:

1) Study the likelihood of receiving radiation with a diagnosis of metastatic breast and cervical cancer for women 65 years of age and older.
2) Explore the usage of various radiation therapy modalities for women with a diagnosis of breast and cervical cancers.

3) Explore descriptive statistics regarding radiation usage and refusal.

## Rationale for the Study

Palliative practice settings such as a hospital palliative units or hospice will at times encounter patients who require unusually high opioid doses. Rentinck, Schrijver, Kneppers, Zijlmans and van Groeningen, (2004) state that "the most common sites of metastatic disease in cervical cancer are the lungs, extra pelvic lymph nodes, liver and bone" (p. 88). The most common cancers that one sees bone metastases, however, are metastatic prostate or breast cancer.

The literature search did not discover studies documenting radiation utilization for palliative purposes. Radiopharmaceutical therapy, which is a radiation compound that is delivered through an intravenous route and external beam radiotherapy are treatments that have been studied in managing bone pain associated with metastatic cancers and its effectiveness.

The main goal of pain treatment is to eliminate pain altogether or to reduce pain to a level whereby one's function is optimized. The first course of treatment may entail radiotherapy not for a curative intent, but to relieve suffering and improve one's quality of life (Johnson, 2004). Understanding if this modality is being used is relevant to recognizing if all is being done when an individual suffers from severe pain.

## Hypothesis

The hypothesis is that radiation therapies are underutilized as a palliative intervention even though numerous studies show that this is an appropriate intervention for pain management especially with bone metastasis.

## Significance of Study

The study is significant in that it may provide useful information for whether all modalities such as radiation is being used to manage pain during advanced stages of cervical and breast cancer. Being diagnosed at such a late stage is an obvious failure at the primary level of public health regarding prevention and early detection. The social and behavioral significance for public health allows for the analysis of associations between the variables of advance cancers, age, and ethnicity versus whether radiation is used or not used. The findings in this study may provide building blocks in establishing an understanding of behavioral and social needs of cancer patients.

## Definition of Terms

Cancer tissue: Proliferating malignant cells; an area of active production of malignant cells. Cancer tissue includes primary tumor and metastatic sites where cancer tissue grows. Cells in fluid such as pleural fluid or ascitic fluid are not "cancer tissue" because the cells do not grow and proliferate in the fluid (Johnson, 2004).

Palliative treatment: The World Health Organization describes palliative care as treatment that improves the quality of life by preventing or relieving suffering. Palliative therapy is also part of the first course of therapy when the treatment destroys or modifies cancer tissue. Palliative therapy may also be part of the first course of therapy if it destroys proliferating cancer tissue (Johnson, 2004).

> Example: The patient was diagnosed with stage IV cancer of the prostate with painful boney metastases. The patient starts radiation treatment intended to shrink the tumor in the bone and relieve the intense pain. The radiation treatments are

palliative because they relieve the bone pain; the radiation is also first course of therapy because it destroys proliferating cancer tissue (Johnson, 2004).

Distant metastases: "Tumor cells that have broken away from the primary tumor and have traveled to other parts of the body and have begun to grow at the new location" (Young, Roffers, Ries, Fritz, & Hurlbut, 2000, p. 8).

Distant stage: Also called remote, diffuse, disseminated, metastatic, or secondary disease (Young, Roffers, Ries, Fritz, & Hurlbut, 2000, p. 8).

Pain: "An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Pain is always subjective" (American Pain Society, 2003, p.1).

Staging: The process of finding out how far the cancer has spread; by gathering information from exams and diagnostic tests to determent the size of the tumor, how deeply the tumor has invaded tissues within and around the region and the presence of spread to lymph nodes or distant organs (metastasis) (Zangwill, 2005). Staging ranges from 0 to 4 with levels at each stage of A, B, C.

Tumour-Node-Metastasis (TNM): This system is used to classify cancer into stage or to describe how far a cancer has spread at the time of diagnosis. (Shenkier et al., 2004).

## Assumptions and Limitations

Possible limitations with this study are that administrative databases have inherent problems with data collection and coding. However, according to the National Cancer Institute (n.d.), the SEER Program is considered the standard for quality among cancer registries and every year studies are conducted in SEER areas to evaluate the quality and

completeness of the data being reported. Also since the ability to control for a patient's ability to pay is unable to be controlled a causal link of any associations is not possible.

# CHAPTER II

# LITERATURE REVIEW

This literature review provides the reader with background information concerning the magnitude of pain suffering throughout the United States to include cancer associated pain. Information given includes the pervasiveness of pain suffering, issues surrounding why it is so difficult to treat pain, and how cancer causes pain. Also in order to have an appreciation for cancer related pain and palliation of this pain it is necessary to have a general knowledge of both breast and cervical cancer incidence and mortality in the United States. Finally, the literature will provide a conceptual framework of the effectiveness of radiation as a palliative modality for bone matastases pain.

## Pain's Pervasiveness

Pain is a universal disorder that warns us that something is not quite right and is inescapable human condition. Pain at its worse, debilitates and robs a person of productivity, happiness, and quality of life. Hill (2003) reported there are 50 million Americans suffering from chronic pain and another 25 million from acute pain

Of this 75 million suffering from pain, 34 million suffer from intractable pain, a pain state so severe that the cause of the pain cannot be removed or otherwise treated. (The National Foundation for the Treatment of Pain, 1999). Cancer pain is often excruciating once it grows and spreads throughout the body. Of cancer patients, "one-

third of adult patients in active therapy and two-thirds of patients with advanced disease have significant pain" (What to do about pain, n.d., p. 36).

Americans needlessly suffer from pain because they do not receive effective treatment. This ineffective treatment is a result of barriers created by societal stigmas, taboos, under-treatment, and mismanagement that blocks patients from receiving the relief they need. Cultural elaboration of pain also plays a big part in ineffective pain management due to diverse categories, idioms, and modes of experiences that different ethnicities and races use to describe pain complaints (Good, Brodwin, Good, & Kleinman, 1992).

Pain at its worse, possibly being chronic pain can be differentiated from acute pain in that acute pain signals a specific nociceptive event and is self-limited. Chronic pain may begin as acute pain, but it continues beyond the normal time expected. It last months or years and causes emotional and psychological effects that can and often does cause impaired sleep, loss of appetite, anxiety, frustration, anger, isolation, and depression.

Significant emotional consequences may lead to a depression and it is a common problem with advanced cancer (What to do about pain, n.d.). The experience of unresolved depression may be so deep that the experience causes the person to ruminate about suicide that ultimately leads to committing suicide. "Pain sufferers often experience pain as an intrusive foreign agent: an unwelcome force producing great physical distress as well as moral and spiritual dilemmas" (Good et al., 1992, p.12).

## Pain Assessment and Treatment

In order to have a respect for the many faces of pain, one must have knowledge of pain's intangibility and why it is a complicated process. There is no objective measure of pain, a pain gauge so to speak, that can be used to diagnose its severity. Pain measurement escapes objectivity and thus renders pain a quintessentially anomic condition: no coherent system of values and beliefs or successful cultural construction emerges from the pain experience (Good et al., 1992).

This phenomenon thus cause patients great frustrations in that there is no objective means to establish valid pain descriptions for health providers and society at large, to include significant others and among pain sufferers themselves (Good et al., 1992). There is no way to tell how much pain a person has, nor are there any test that can measure the intensity of pain, no imaging device that can show pain, and no instrument that can locate pain precisely.

There are however, a number of electrodiagnostic procedures that can be used to find the cause of pain. Procedures such as electromyography (EMG), nerve conduction studies, and evoked potential (EP) studies can tell precisely which muscles or nerves are affected by weakness or pain (National Institute of Neurological Disorders and Stroke & National Institute of Health [NINDS & NIH], 2001). Radiology test and Magnetic Resonance Imaging can show fractures and soft tissue compressions that cause pain. It is worth noting that although these procedures are an effective means to determining what is causing pain there are often instances where the cause can not be identified even with such procedures.

In the end, physicians find that the best aid to pain diagnosis and thus what treatment to prescribe lies in the patient's own description of the type, intensity, duration and location of pain, and here is where the problems begin in pain treatment. "Doctors must depend on inferences about severity based on what they can see about the illness and on what else they observe about the patient" (IOM, 2002, p.3). By doing this the physicians operate on prior beliefs that are different according to age, gender, socioeconomic status and race or ethnicity that influence medical decisions (IOM, 2002).

The main goal of pain treatment is to eliminate pain altogether or to reduce pain to a level whereby one's function is optimized, resulting in enabling individuals to work, attend school, participate in social activities and conduct day-to-day activities to include personal care regimens. There are many options for the treatment of pain, ranging from non-invasive therapies such as, medications, relaxation and meditation to the extreme of radiation, chemotherapy and surgery.

Many healthcare settings, to including palliative practice settings such as hospital palliative units or hospices will at times encounter patients who require unusually high opioid doses and find that even large doses are not effective in reducing pain. Patients diagnosed with cancer suffer from pain that is often associated with metastatic or recurrent disease. Anderson et al. (2000) note that "inadequate assessment of patients' pain was identified as the top barrier to good pain management" (p. 1930).

## About Breast and Cervical Cancer

Female breast cancer is the "most commonly diagnosed cancer among women for every racial population" (McLaughlin et al., 2004, p. viii). Cervical cancer, however; has

its "highest percentage (9% of all cancers among Vietnamese women)... than any other racial population" (McLaughlin et al., 2004, p. ix) and is one of the five most commonly diagnosed cancers among Hispanic and Black women (McLaughlin et al., 2004). Figure 1 and 2 (respectively) of Appendix A provides a graph of incidence by race of breast and cervical cancer for 1992-2001 as reported by 12 SEER areas of race/ethnicity.

Mortality data from 1997-2001 indicates that a total of "2,737,842 persons in the U.S. died of cancer in [this] five year period [and that] slightly less than half (48%) occurred among females" (McLaughlin et al., 2004, p. xii). Of these deaths "the percentage of deaths from breast cancer was higher among black women than that among women of any other race, one of the most common causes of cancer deaths among Hispanic women, and the second leading cause of death among white women" (McLaughlin et al., 2004). Figure 3 and 4 (respectively) of Appendix A provides a summarization of mortality by race of breast and cervical cancer for 1990-2001 as reported by 12 SEER areas.

A report to the Nation on cancer and survival recognizes that there has been "considerable progress in reducing the cancer burden in the U.S. [and] that death rates have continued to decrease since the early 1990s for men and women for many of the top 15 cancers" (Jemal et al., 2004, p. 17) to include breast cancer. However, overall there is significant differences in survival between racial and ethnic populations and as such, providers and the public require a knowledge of barriers to cancer pain control for all groups and become more culturally sensitive to the special needs of those they serve.

## Metastatic Cancer Pain

Bone metastases present itself with pain and loss of mechanical stability. The condition requires palliative therapy, especially since it is incurable. Therapies may include hormonal application chemotherapy and radiotherapy (Kücük et al., 2000). The reason for pain from bone metastatsis is not totally understood.

Smith, Navani, and Fisher (2004) pointed out that "pain secondary to osseous metastasis is most commonly due to tumor infiltration and stretching of periosteal membranes, which are richly innervated with nociceptors" (p. 303). Other possible causes of pain include mechanical instability from tumor-weakened bones that release certain chemicals to contiguous neurological structures, such as the spinal cord and other nerve roots (Smith, Navani, & Fisher, 2004).

There are other mechanisms that are believed to cause pain some more complicated than others dealing with the release of stimulatory factors. Understanding its etiology is important; however, for the purpose of this study a general understanding is sufficient. Recognizing bone mestastasis prevalence; however, is vital to the utilization of radiation.

> Breast carcinoma and prostate carcinoma are the most common cause of pain from malignant bone disease. This fact underscores the prevalence of these two types of carcinoma and their affinity for metastasizing to bone. In fact, 70% of patients with advanced breast...have skeletal metastases, and skeletal metastases are present in > 90% of patients who die from breast or prostate carcinoma (Clohisy & Mantyh, 2003, p.866).

## Radiation Effectiveness

Studies show that radiation for bone metastases provides substantial pain relief 70-80% of the time (What to do about pain, p. 37). In the U.S. the Radiation Therapy Oncology Group (RTOG) evaluated a variety of radiation dose schedules for localized external beam radiation. Janjan (1997) reported a total of 1016 patients were studied at different dose fractionation schedules and stratified the treatments based on solitary or multiple bony metastases. Study findings concluded that "partial relief of pain was achieved in 83% and complete relief occurred in 53% of the patients studied" (Janjan, 1997, p. 1630).

It should be noted that "50% of patients with multiple bone metastases developed recurrent pain in the treated area and the median duration of pain control was 12 weeks for all radiation schedules used" (Janjan, 1997, p. l630). Also a reanalysis of the data was completed to redefine and exclude the patients with continued use of analgesics. Findings after the reanalysis showed 55% of patients with solitary bone metastases achieve relief of pain dependent on radiation dose of fractionation (Janjan, 1997).

Between beam radiation and chemotherapy that focus on eradicating tumors, "external beam radiation is most effective at relieving pain with 90% of patients receiving some pain relief and 50% of patients experiencing a period of complete pain relief" (Clohisy & Mantyh, 2003, p. 867). Unfortunately, as noted in the Janjan article "[greater than] 50% of patients who receive some pain relief will have their pain return to pretreatment levels" (Clohisy & Mantyh, 2003, p. 867).

Kücük et al. (2000) suggest that the standard treatment options for bone metastases associated pain are external beam radiotherapy and use of analgesics drugs. However, due to the large number of tumor lesions that accompany bone metastases radionuclide therapy (radiopharmaceutical therapy) with specifically localized internal beta emitters may be preferable (Kücük et al., 2000).

A study using radionuclide therapy of thirty-one patients with various cancers including 10 breast carcinoma cases resulted in an overall response rate of 67.5% with a mean palliation period of 8.1 +/- 1.3 weeks. (Kücük et al., 2000) The third and seventh week showed the maximal palliation effect and no serious side effects were seen except mild hematologic toxicity (Kücük et al., 2000).

One study found radiotherapy usage for cervix uteri cancer in which sixty-two radiation therapy facilities participated. The study was conducted on 471 patients with cervical cancer of which "8% of patients [had] Stage IIIB and 50% of patients with Stage IVA disease were treated with palliative intent only (Eifel, 1999, p. 354). This study only reported results of patients treated with a curative intent so the effectiveness of radiotherapy for pain control was not provided.

The ten female patients studied in the Kücük et al article (2000) reported having advanced cancers with two being inoperable and the others had modified radical mastectomy and lymph node resection. Eight of the ten females received radiotherapy in combination with chemotherapy and hormonotherapy. "Four patients showed sighs of complete response [and] the other four had a decrease in the pain level, but still needed low dose analgesics" (Kücük et al., 2000, p. 242).

The increase clinical use of alternative means for delivering radiation to bone metastases is radiopharmaceutical agents that are delivered to osseous metastases through intravenous administration (Smith, Navani, & Fishman, 2004). Pharmaceutical agents are essentially the same agents used for imaging in bone scans for nuclear medicine. These agents known as radionuclides attach to bone-seeking agents which enables the radiation to be emitted at the sites of bone metastases (Smith, Navani, & Fishman, 2004).

Using pharmaceutical agents may allow for imaging of the metastatic lesions if the radionuclide is both a beta and gamma emitter giving health personnel an objective look at the degree of bone metastasis (Smith, Navani, & Fishman, 2004). Pharmaceutical agents are especially "compelling in cases of widespread or diffuse bony metastasis, but may also be effective early in disease progression in the treatment of limited painful metastatic sites (Smith, Navani, & Fishman, 2004).

Other advantages of radiopharmaceutical over conventional external beam radiation are as follows: "1) they can be administered intravenously; 2) they can treat multiple diffuse sites with mild bone marrow depression; and 3) they cause fewer adverse side-effects such as nausea, vomiting, diarrhea, and tissue damage" (Smith, Navani, & Fishman, 2004, p. 304). Strotium-89 chloride (89Sr) is currently one beta emitter radiopharmaceutical available in the United States for clinical administration (Smith, Navani, & Fishman, 2004).

Result of 89Sr showed "pain relief usually begins within two weeks of treatment with maximum benefit by six weeks, and lasts between four and 15 months" (Smith, Navani, & Fishman, 2004, p. 307) with mild decreases in platelets and white blood cells.

According to a study by Robinson et al. in 1993, of 240 patients with prostate cancer and 47 patients with breast cancer who received 89Sr "experienced a dramatic improvement in pain relief and quality of life [and] after treatment, 15 percent were pain free" (cited in Smith, Navani, & Fishman, 2004 p. 307).

Finally, Smith, Navani, and Fishman (2004) contended that "radiopharmaceutical agents offer a reasonably safe and effective therapeutic analgesic option for patients with cancer and painful osseous metastases. Nonetheless, the use of radiopharmaceutical agents for the treatment of painful osseous metastases remains underutilized" (p. 311). The literature search did not uncover any studies with specific statistics of radiotherapy utilization for palliation, although many studies did document its effectiveness.

Also an important issue to note is that not all patients with metastatic bone cancer are candidates for this palliative therapy. The indications to treat bone mestastases with radiation obviously include pain, but also prevention of morbidity from disease progression, such as pathologic fracture and spinal cord compression (Janjun, 1997).

Clinical practice guidelines developed by the National Comprehensive Cancer Network (NCCN) is considerably complex and has established algorithms for pain management. The 2004 NCCN practice guidelines state that trial radiation, hormones or chemotherapy is indicate with painful lesions that are likely to respond to antineoplastic therapies.

Specifically, for bone pain without an oncologic emergency (i.e. epidural cord compression or impending fracture) consideration should be given to the use of local radiation therapy or nerve block for local bone pain, for example rib pain (National

comprehensive Cancer Network [NCCN], 2004). Other considerations for specific pain problems, such as diffuse bone pain include a trial of bisphosphonates, hormonal or chemotherapy for responsive tumors and administration of radioisotopes in selected patients (NCCN, 2004).

# CHAPTER III

# METHODOLOGY

The purpose of this study is to provide statistical data on the utilization of radiation modalities and factors that are associated with its use. Knowledge from this study can provide the following:

1) Study the likelihood of receiving radiation with a diagnosis of invasive breast and cervical cancer for women 65 years of age and older.
2) Explore the usage of various radiation therapy modalities for women with a diagnosis of breast and cervical cancers and any associated factors, such as martial status, age and race ethnicity.
3) Explore descriptive statistics regarding radiation usage and refusal.

## Study Population and Data Source

Data was analyzed from 1992-2001 using the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute. The 1992-2001 time point was used because two registries were added to the SEER Program which contains racially and ethnicity diverse populations from registries that serve San Jose-Monterey and Los Angeles. These two registries increased the coverage of minority populations, especially Hispanics (NCI, n.d.).

The November 2003 Public-Use Data files were used that not only included the above two mentioned registries, but also San Francisco-Oakland, Connecticut, Detroit Metropolitan, Hawaii, Iowa, New Mexico, Seattle-Puget Sound, Utah, Atlanta-Metropolitan and Alaska. Patient medical records are the principal sources of data used by the SEER registries.

All registries are members of the North American Association of Central Cancer Registries, (NAACCR). This organization is a "professional organization that develops and promotes uniform data for cancer registration ... and certifies population registries" (The North American Association of Central Cancer Registries, n.d.).

The SEER November 2003 data files have been broken out into nine cancer site group files, as follows: breast; colon and rectum; other digestive; female genital; lymphoma of all sites and leukemia; male genital; respiratory; urinary; and other (Surveillance, Epidemiology, and End Results [SEER] Program, 2004). Breast and the female genital sites were used for this study; however, only cervical cancer uteri were analyzed of the female genital site.

The researcher assessed the relationship between breasts and cervix uteri cancers at Stage IV (with Stage IIIB as the reference group), and the use of radiation for palliation of all women 65 years of age and older while controlling for age at diagnosis, martial status and race. Women 65 years of age and older who were diagnosed as having a first primary invasive breast and cervix uteri cancers of a Stage IIIB and Stage IVs between January 1, 1992 and December 31, 2001 were identified through the 12 SEER registries listed above.

The dependent variable is whether radiation therapy as a first course of treatment was used or not used (dichotomous variable of not used and the patient refused). Independent variables to be used are:

- A diagnosis of breast or cervical cancer (primary site);
- Stage IV;
- Age group at diagnoses women 65 years of age and older;
- Martial status; and
- Race that is coded into the following groups:
    - White Non-Hispanic
    - White Hispanic
    - Black
    - Other (American Indian, Chinese, Japanese, Filipino, Hawaiian, Other and Unknown)

The initial number of women with a diagnosis of breast or cervix uteri cancer at any stage equaled to 341,365. Of the 341,365 breasts and cervix uteri cases all women were excluded who were 64 years old and younger and any women who did not have a Stage IIIB or IV. Also any women who were not coded on the SEER Summary Stage as regional by direct extension and lymph or distant site(s)/nodes involved were excluded. A total sample of 6,505 breast cancer cases and 758 cervix uteri cancer cases remained.

## Cancer Staging

The SEER registries provide information concerning age at diagnosis, year of diagnosis and a wealth of information concerning tumor characteristics, such as the

following: American Joint Committee on Cancer stage and Summary Staging. The National Cancer Institute (2000) defines "summary staging [as] the most basic way of categorizing how far a cancer has spread from its point of origin" (p. 2).

Summary staging is a required data field for facilities and central registries that participate in the National Program of Cancer Registries (NPCR) of the Centers for Disease Control and Prevention and the information is retrieved by the patient's medical record. By using the patients medical record the information gathered is a combination of the most precise clinical and pathological documentation of the extent of disease (National Cancer Institute [NCI], 2000). The medical information is prioritized in order of pathologic, operative and clinical (Shambaugh, Weiss, & Axtell, 1977).

There are five main categories in summary stage that are also subcategorized by the method of spread using a single digit system (American Joint Committee on Cancer [AJCC], 2004). Summary staging categories include in situ, local, regional to lymph nodes, regional by direct extension, both regional lymph nodes and regional extension, regional not otherwise specified, and distant whereby this study deleted all categories except both regional by direct extension and lymph node involvement and distant site(s)/node(s) involved (AJCC, 2004).

Stages IIIB and IV were selected because of the potential for pain. According to NCCN (2004) "pain is one of the most common symptoms associated with cancer... [and] three quarters of patients with advance disease" experience pain. I was interested in assessing whether radiation treatments given to women with stage IV were being utilized

and if there was any association, between stage controlling for age, martial status and race/ethnicity.

# CHAPTER IV

## ANALYSIS

Statistical analysis was completed using SPSS 11 for Windows. The analysis of all variables mentioned included descriptive (univariate) statistics, and cross-tabulations were generated. Bivariate analyses included chi-square test of independence between radiation and all independent variables. Cross tabulation of radiation by martial status was controlled for age category. A logistic regression model was developed with Stage IIIB, age category of 65 to 69 years of age, and single women used as reference groups.

Odds ratios were calculated for each dichotomous and continuous independent variable to test the statistical significance. The dependent variable radiation was recoded to a dichotomous selection of no radiation and yes radiation. Those listed as none and refused for radiation were grouped into the category of no radiation and those that received one or a combination of radiations were grouped into yes for radiation. Any case listed as unknown or recommended, unknown if administered were eliminated from analysis.

### Results

Table 1 for breast cancer and Table 2 for cervix uteri show a comparison of whether radiation was given. For breast cancer, the observed values for no radiation given at stage IV were greater than the expected values for the following age controlled

categories: ages 65-69; ages 70-74; and ages 75-79. These three age categories were statistically significant for radiation by stage of cancer with $X^2$ having a p-value equal to or less than .001 for age categories of 65-69 years and 70-74 years. Age category of 75-79 years had a statistical significance of a p-value less than .05.

Table 1. Chi Square Table for Breast Cancer

| Age Category (N=6505) | | Stage | | |
|---|---|---|---|---|
| AGES 65-69 ** | Radiation (RAD) | IIIB | IV | Total |
| | No RAD Observed count | 193 | 704 | 897 |
| | Expected count | 226.2 | 670.8 | 897 |
| | Yes RAD Observed count | 191 | 435 | 626 |
| | Expected count | 157.8 | 468.2 | 626 |
| | % of Total | 25.2% | 74.8% | 100% |
| AGES 70-74 ** | | | | |
| | No RAD Observed count | 190 | 754 | 944 |
| | Expected count | 230.2 | 713.8 | 944 |
| | Yes RAD Observed count | 186 | 412 | 138 |
| | Expected count | 145.8 | 452.2 | 138 |
| | % of Total | 24.4% | 75.6% | 100% |
| AGES 75-79* | | | | |
| | No RAD Observed count | 207 | 721 | 928 |
| | Expected count | 227.3 | 700.7 | 928 |
| | Yes RAD Observed count | 143 | 358 | 501 |
| | Expected count | 122.7 | 378.3 | 501 |
| | % of Total | 24.5% | 75.5% | 100% |
| AGES 80-84 | | | | |
| | No RAD Observed count | 193 | 543 | 736 |
| | Expected count | 198.6 | 537.4 | 736 |
| | Yes RAD Observed count | 89 | 220 | 309 |
| | Expected count | 83.4 | 225.6 | 309 |
| | % of Total | 27.0% | 73.0% | 100% |
| AGES 85+ | | | | |
| | No RAD Observed count | 231 | 530 | 761 |
| | Expected count | 232.4 | 528.6 | 761 |
| | Yes RAD Observed count | 64 | 141 | 501 |
| | Expected count | 62.6 | 142.4 | 501 |
| | % of Total | 30.5% | 69.5% | 100% |

Note. * $p < .05$, **$p < .01$

Cervix uteri cancer (Table 2) showed a statistical significance for radiation by stage controlling for age; however, breast cancer had more significant age category

groups than cervix uteri cancer. The cervix uteri had a statistical significance for $X^2$ with p-value equal to .05 for age category of 70-74 years and a borderline significance of .080 for the 65-69 years of age category.

Table 2. Chi Square Table for Cervix Uteri Cancer

| Age Category | Radiation (RAD) | | Stage IIIB | Stage IV | Total |
|---|---|---|---|---|---|
| AGES 65-69 | No RAD | Observed count | 9 | 54 | 63 |
| | | Expected count | 14.1 | 48.9 | 63 |
| | Yes RAD | Observed count | 44 | 130 | 174 |
| | | Expected count | 38.9 | 135.1 | 174 |
| | % of Total | | 22.4% | 77.6% | 100% |
| AGES 70-74 * | | | | | |
| | No RAD | Observed count | 4 | 48 | 52 |
| | | Expected count | 8.5 | 43.5 | 52 |
| | Yes RAD | Observed count | 27 | 111 | 138 |
| | | Expected count | 22.5 | 115.5 | 138 |
| | % of Total | | 16.3% | 83.7% | 100% |
| AGES 75-79 | | | | | |
| | No RAD | Observed count | 5 | 46 | 51 |
| | | Expected count | 8.1 | 42.9 | 51 |
| | Yes RAD | Observed count | 19 | 82 | 101 |
| | | Expected count | 15.9 | 81.2 | 101 |
| | % of Total | | 158% | 84.2% | 100% |
| AGES 80-84 | | | | | |
| | No RAD | Observed count | 1 | 40 | 41 |
| | | Expected count | 3.4 | 37.6 | 41 |
| | Yes RAD | Observed count | 8 | 58 | 66 |
| | | Expected count | 5.6 | 60.4 | 66 |
| | % of Total | | 8.4% | 91.6% | 100% |
| AGES 85+ | | | | | |
| | No RAD | Observed count | 1 | 36 | 37 |
| | | Expected count | 1.5 | 35.5 | 37 |
| | Yes RAD | Observed count | 2 | 33 | 35 |
| | | Expected count | 1.5 | 33.5 | 35 |
| | % of Total | | 4.2% | 95.8% | 100% |

Note. * $p < .05$, ** $p < .01$

An interesting finding was the association of marital status and the use of radiation for breast cancer. Crosstabs for radiation by martial status controlling for age found $X^2$ to be significant with p-value equal to .005 for married women. Logistic

regression analysis; however, using single status as a reference showed no significant association in receiving radiation treatment with independent variables of stage of breast cancer, race/ethnicity, marital status, and age group.

As a result of the 2x2 tables a logit model for further testing was conducted for any association between the dependent variable and independent variables. Table 3 shows significant odds ratio findings for both breast and cervix uteri with Stage IIIB, single status, and age category of 65-69 years age as reference groups.

Women with a Stage IV breast cancer compared to women with a diagnosis of Stage IIIB breast cancer are 30% less likely to have radiation with a p-value of less than .001. A diagnosis of cervix uteri cancer of Stage IV was also found to be significant with a women being 57% less likely to have radiation compared to a diagnosis of Stage IIIB cervix uteri cancer.

Other variables that showed significance were age categories for both breast and cervix uteri. Those between ages 75 and 85 plus years of age for breast cancer were 20% to 60% less likely to receive radiation. However, only the age category of 85 plus years of age for cervix uteri was significant, being 60% less likely to receive radiation.

Of the independent variables used, race and ethnicity showed no significance in either the $X^2$ test of independence or logistic regression, for either breast or cervix uteri cancers. However, Black racial identity had a borderline significance, with p-value equal to .078 with Stage IV breast cancer being associated with a decrease of 15% in odds of having radiation. The cervix uteri logistic regression results showed other, races to be 70% more likely to receive radiation at Stage IV than the reference group of Non-

Hispanic Whites with a p-value equal to .082. However, this odds ratio had a wide confidence interval of (.935, 3.098).

Table 3. Logistic Regression for Breast and Cervix Uteri Cancers

| | Variables | B | Sig. | OR | 95% C. I. for OR |
|---|---|---|---|---|---|
| **Breast Cancer** (N=6505) | | | | | |
| | AJCC Stage *(Ref. – IIIB)* | | | | |
| | Stage | -.362 | .000* | .696 | (.620, .782) |
| | Race *(Ref. – White Hispanic)* | | | | |
| | Black | -.157 | .078 | .855 | (.718, 1.018) |
| | White Hispanic | -.071 | .526 | .932 | (.749, 1.159) |
| | Other | .028 | .820 | 1.02 | (.809, 1.307) |
| | Martial Status *(Ref. - Single)* | | | | |
| | Married | .144 | .114 | 1.154 | (.966, 1.380) |
| | Separated | .500 | .218 | 1.649 | (.744, 3.653) |
| | Divorced | .110 | .360 | 1.116 | (.882, 1.412) |
| | Widowed | -.046 | .607 | .956 | (.803, 1.136) |
| | Age Category *(Ref. – Ages 65-69)* | | | | |
| | Ages 70-74 | -.082 | .274 | .922 | (.797, 1.067) |
| | Ages 75-79 | -.227 | .003* | .797 | (.685, .928) |
| | Ages 80-84 | -.467 | .000* | .627 | (.527, .745) |
| | Ages 85+ | -.903 | .000* | .405 | (.334, .492) |
| | Constant | -.137 | .182 | .872 | |
| **Cervix Uteri Cancer** (N=758) | | | | | |
| | AJCC Stage *(Ref. – IIIB)* | | | | |
| | Stage | -.844 | .001* | .430 | (.256, .721) |
| | Race *(Ref. – White Hispanic)* | | | | |
| | Black | .138 | .559 | 1.148 | (.723, 1.821) |
| | White Hispanic | .249 | .328 | 1.283 | (.779, 2.113) |
| | Other | .532 | .082 | 1.702 | (.935, 3.098) |
| | Martial Status *(Ref. - Single)* | | | | |
| | Married | .095 | .744 | 1.100 | (.622, 1.942) |
| | Separated | -.050 | .955 | .951 | (.166, 5.442) |
| | Divorced | .264 | .484 | 1.302 | (.622, 2.723) |
| | Widowed | .128 | .640 | 1.137 | (.663, 1.949) |
| | Age Category *(Ref. – Ages 65-69)* | | | | |
| | Ages 70-74 | .017 | .940 | 1.017 | (.653, 1.585) |
| | Ages 75-79 | -.277 | .239 | .758 | (.478, 1.203) |
| | Ages 80-84 | -.417 | .107 | .659 | (.397, 1.094) |
| | Ages 85+ | -.906 | .002* | .404 | (.226, .723) |
| | Constant | 1.477 | .000 | 4.379 | |

Note. * $p < .01$

A descriptive analysis was also performed for radiation as a non-dichotomous variable for frequencies. Radiation groups were as follows: none; beam radiation; radioactive implants; radioisotopes; combination of beam radiation with radioactive implants or radioisotopes; radiation not specified; refused; recommended unknown if administered; and unknown. The univariate analysis for radiotherapy modalities revealed that radioactive implants and radioisotopes are underutilized. Chi squares did not support any further exploration of 2x2 tables for radiation by race or martial status.

# CHAPTER V

# DISCUSSION

Data from the SEER Program were analyzed to study the utilization of radiation. The results of this study support the conclusion of underutilization of radiation in Stage IV breast and cervical cancers for palliative purposes. Janjan (1997) contends that "bone involvement due to cancer occurs in >60% of patients [and] up to 85% of patients with breast, lung or prostate carcinomas will have bone metastases" (p.1639). Stage IV breast and cervical cancers were used to assess the need for pain management interventions.

The literature review supports the conclusion that radiotherapy provides effective palliation of pain and depending on the radiation modality, may provide "palliation of pain lasting greater than 6 months in 60-80% of patients with breast carcinomas" (Janjan, 1997, p. 1636). Patients with advanced stage cancers may have only months to live, but may be interested in continuing anticancer therapy to try to live longer or to try to reduce their cancer-related symptoms (NCCN, p. MS-3). However, results of this study indicate that radiation is not being utilized as expected, from analysis of contingency tables.

The World Health Organization's model of resource allocation in cancer care recommended palliative, symptom-modifying therapy simultaneously with disease-modifying therapy (NCCN, p. MS-1). Also the Palliative Care Guidelines of the

National Comprehensive Cancer Network (NCCN) recommends the consideration of palliative care and its interdisciplinary team concept "for patients with advanced, progressive disease for which there is no effective, curative therapy; those with a life expectancy of 1 year or less; ...." (p. MS-2).

This research finding indicates that the health professional community and the public need to be educated in the potential benefits of radiation for pain management of invasive cancers. Pain management is an integral part of palliative care to reduce suffering and "should not be reserved for those who are close to dying, [but] is appropriate for patients with significant illness from the time of diagnosis" (Emanuel et al., 2004, p. 774).

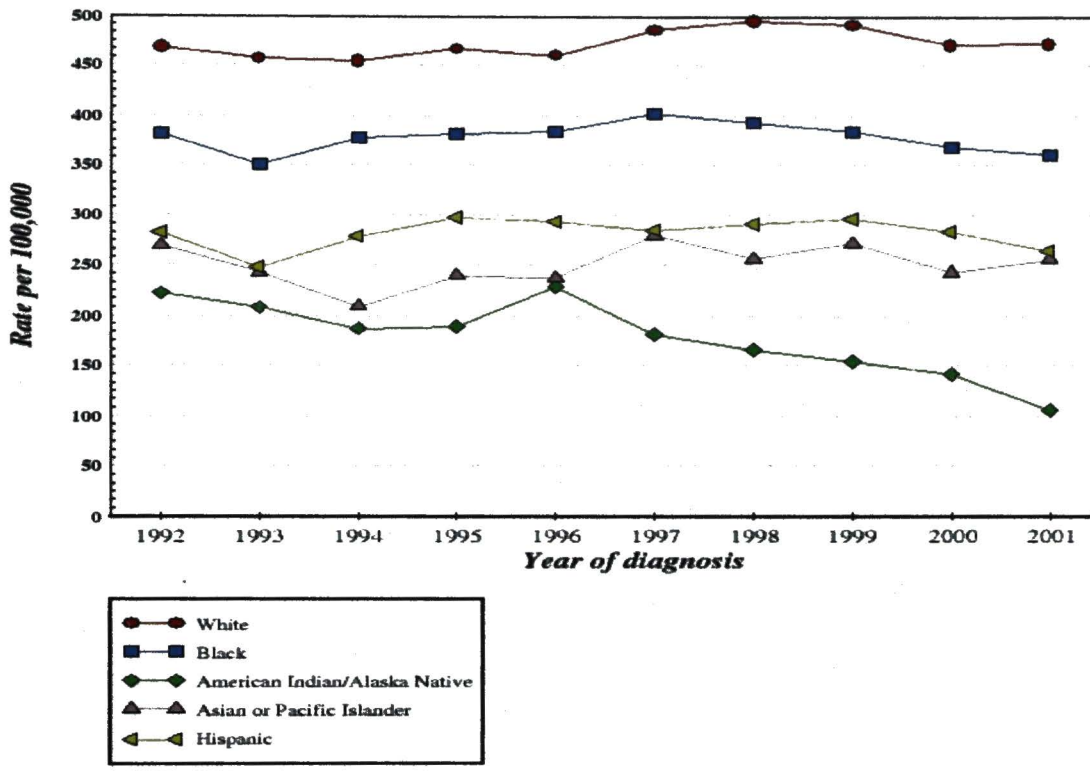
In summary, this study provides the first known population-based data on radiation utilization of invasive breast and cervix uteri cancers controlling for age, martial status and race/ethnicity in the United States. Additional research is needed to clarify the role of socioeconomic status and whether bone metastasis is supported with prognostic test of women diagnosed with invasive breast and cervix uteri cancers.

The findings support the recommendation of a SEER Program inclusion of a variable indicating if treatments are for a curative or palliative purpose. This would assist in analyzing utilization of all treatments. Also, a variable indicating whether the patient has adequate insurance could provide future research with a comprehensive understanding of cancer care disparities as related to race and ethnicity, rather than solely the ability to pay for care.

# APPENDIX A

Incidence and Mortality Graphs for Breast and Cervical Cancers

Figure 1. SEER Incidence – Breast Cancer of Women 65+ for 1992-2001
(Age-adjusted rate)

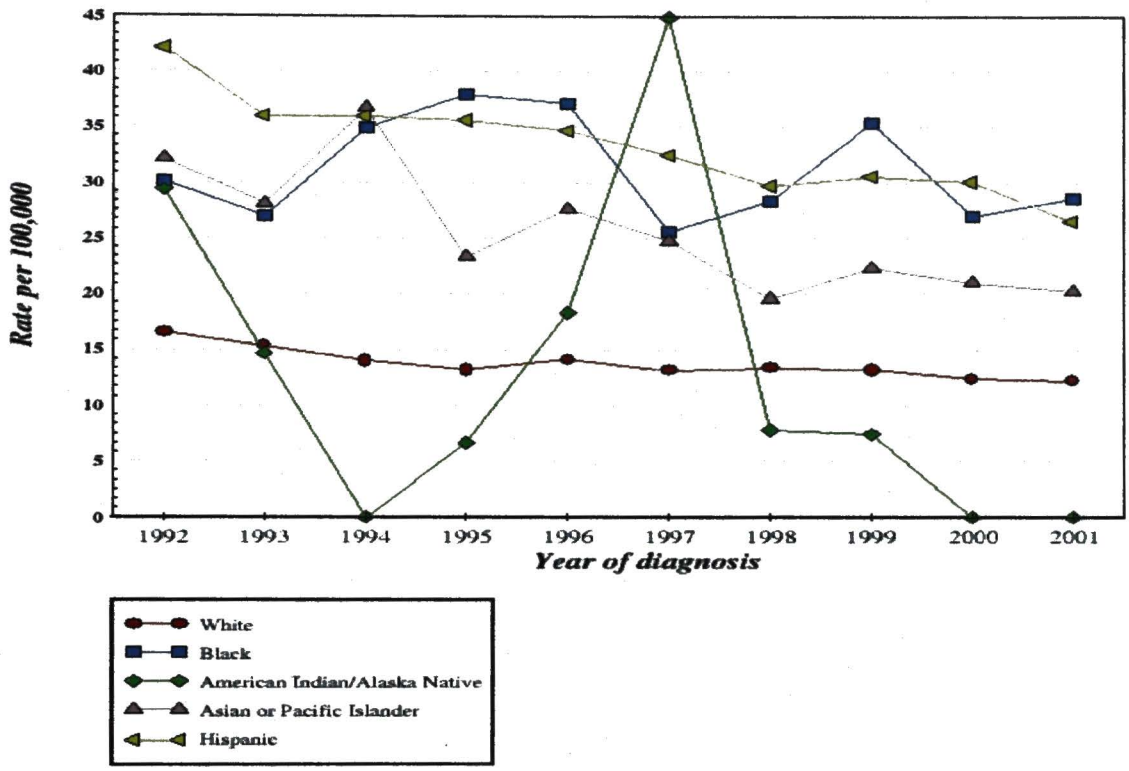



**Notes:**

- Statistics were generated from malignant cases only.
- Rates are expressed as cases per 100,000.
- Statistics are provided by the SEER Program for research purposes only.
- Hispanic and Non-Hispanic are not mutually exclusive from White, Black, American Indian/Alaska Native, and Asian or Pacific Islander.
- Statistics for Hispanics and Non-Hispanics do not include cases from the Detroit, Hawaii, and Alaska Natives registries.

From: Surveillance, Epidemiology, and End Results (SEER) Program. (2004b). (www.seer.cancer.gov) SEER*Stat Databases: Incidence - SEER 11 Regs + AK Public-Use, Nov 2003 Sub for Expanded Races (1992-2001) and Incidence - SEER 11 Regs Public-Use, Nov 2003 Sub for Hispanics (1992-2001), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2004, based on the November 2003 submission.

Figure 2. SEER Incidence – Cervix Uteri Cancer of Women 65+ for 1992-2001 (Age-adjusted rate)




**Notes:**

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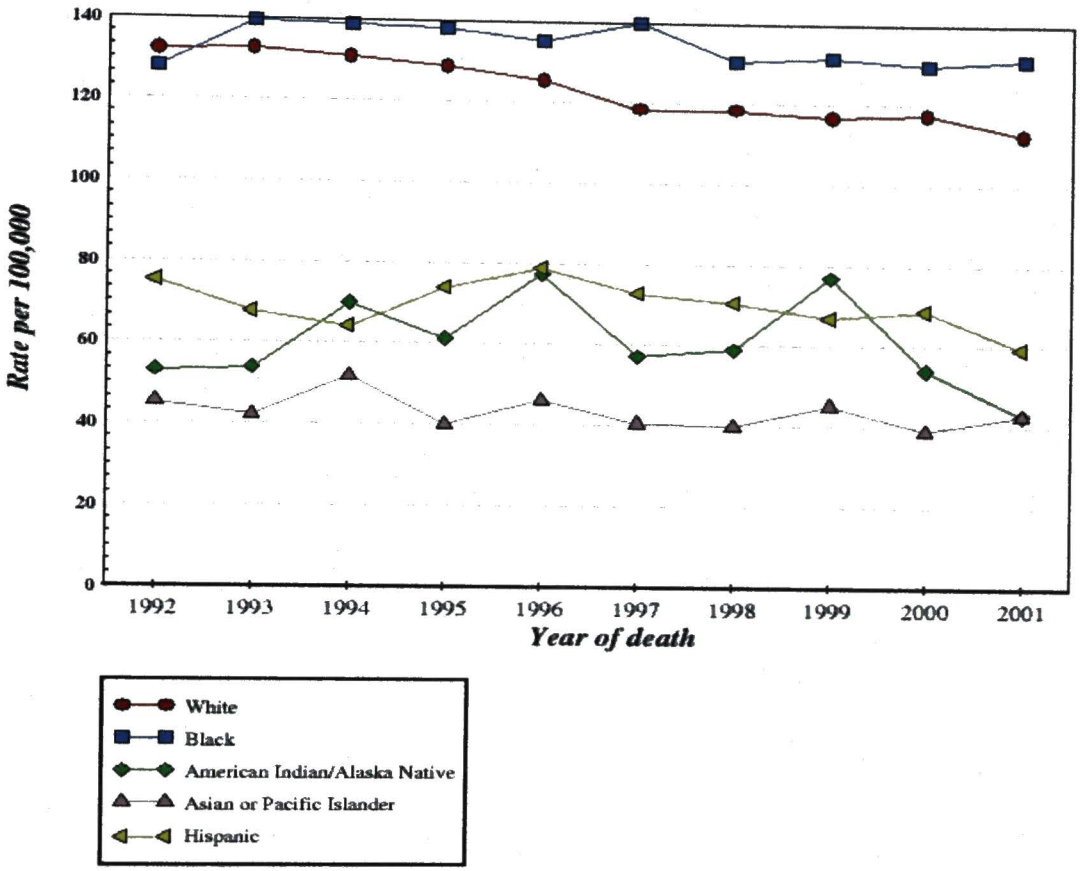
Surveillance, Epidemiology, and End Results (SEER) Program. (2004b) (www.seer.cancer.gov) SEER*Stat Databases: Incidence - SEER 11 Regs + AK Public-Use, Nov 2003 Sub for Expanded Races (1992-2001) and Incidence - SEER 11 Regs Public-Use, Nov 2003 Sub for Hispanics (1992-2001), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2004, based on the November 2003 submission.

Figure 3. U.S. Mortality (total U.S.) – Breast Cancer of Women 65+ for 1990-2001 (Age-adjusted rate)

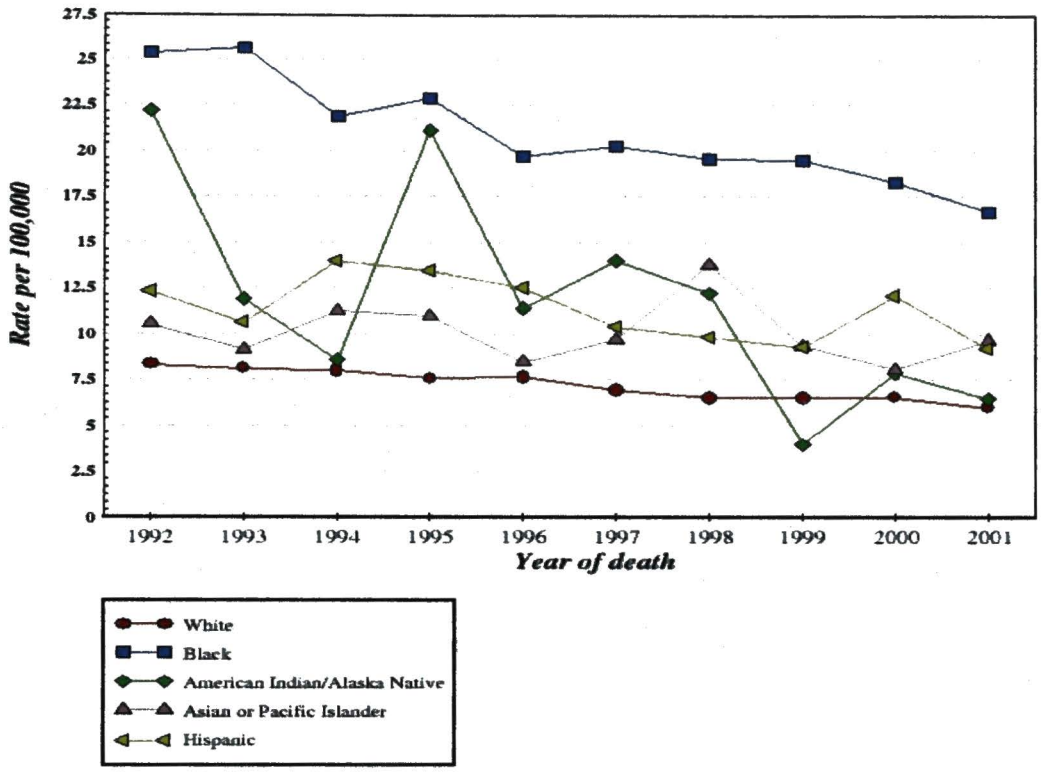



**Notes:**

- Rates are expressed as cases per 100,000.
- Statistics were generated from data provided by the U.S. National Center for Health Statistics.
- Statistics are provided by the SEER Program for research purposes only.
- Hispanic and Non-Hispanic are not mutually exclusive from White, Black, American Indian/Alaska Native, and Asian or Pacific Islander.
- Statistics for Hispanics and Non-Hispanics do not include cases from Connecticut, Maine, Maryland, New Hampshire, New York, North Dakota, Oklahoma, and Vermont. See the SEER Program's policy for calculating Hispanic mortality.

From: Surveillance, Epidemiology, and End Results (SEER) Program. (2004c) (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Public-Use With State, Total U.S. for Expanded Races/Hispanics (1990-2001), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2004. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

Figure 4. U.S. Mortality (total U.S.) – Cervix Uteri Cancer of Women 65+ for 1990-2001 (Age-adjusted rate)




**Notes:**

- Rates are expressed as cases per 100,000.
- Statistics were generated from data provided by the U.S. National Center for Health Statistics.
- Statistics are provided by the SEER Program for research purposes only.
- Hispanic and Non-Hispanic are not mutually exclusive from White, Black, American Indian/Alaska Native, and Asian or Pacific Islander.
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## REFERENCES

American Joint Committee on Cancer. (2004). Introduction. Retrieved on March 14, 2005 from http://www.cancerstaging.org/cstage/cstageintro.html.

American Pain Foundation. (2001-2004). Power over pain: People working together to improve pain management in their communities. Community Action Kit and Media Guide Manual.

American Pain Foundation. (2003). Talking points on pain. Retrieved on April 2, 2004 from http://www.painfoundation.org.

Anderson, K., Richman, S., Hurley, J., Palos, G., Valero, V., Mendoza, T., & et al. (2002). Cancer pain management among underserved minority outpatients. *Cancer, 94*, 2295-2304.

Anderson, K., Mendoza, T., Valero, V., Richman, S., Russel, C., Hurley, J. et al. (2000). Minority cancer patients and their providers – Pain management attitudes and practice. *Cancer, 88,* 1929-1938.

Clegg, L., Li, F., Hankey, B. Chu, K. & Edwards, B. (2002). Cancer survival among US Whites and minorities. *Arch Intern Med, 162*, 1985-1993.

Cliff, B., Harte, N., Kirschling, J. & Ownes, D. (2004). HPNA position paper: Evidence-based practice. *Journal of Hospice and Palliative Nursing, 6,* 189-190.

Clohisy, D. & Mantyh, P. (2003). Bone Cancer Pain. *Cancer Supplement, 97,* 866-873.

Eifel, P., Moughan, J., Owen, J., Katz, A., Mahon, I. & Hanks, G. (1999). Patterns of radiotherapy practice for patients with squamous carcinoma of the uterine cervix: Patterns of care study. *Int. J. Radiation Oncology Biol. Phys., 43,* 351-358. Retrieved on January 10, 2005, from Elsvier Science Inc database (PII S0360-3016(98)00401-5).

Emanuel, L., Alexander, C., Arnold, R., Bernstein, R. Dart, R., Dellasantinia, C. et al. (2004). Integrating palliative care into disease management guidelines. *Journal of Palliative Medicine, 7,* 774-783.

Forman, W. B., Kitzes, J. A., Anderson, R. P. & Sheehan, D. K. (2003). Hospice and palliative care: Concepts and practice, (2nd ed.). Sudbury, MA. Jones and Bartlett Publishers.

Fritz, A. & Ries, L. (Eds.). (1998, January). SEER extent of disease-1998, Codes and coding instructions. (3rd ed.) Bethesda, MD: National Cancer Institute.

Green, C. R., Wheeler, J. R. & LaPorte, F. (2003). Clinical decision making in pain management: Contributions of physicians and patient characteristics to variations in practice. *The Journal of Pain, 4,* 29-39.

Good, Brodwin, Good, & Kleinman. (Eds.). (1992). Pain as human experience an Anthropological perspective. Berkeley, CA: University of California Press.

Hill. (2003). Moral Lesson: The Ethical obligation to treat pain. Conference presentations, slides and handouts multimedia CD-ROM. *UNTHSC PACE*

Institute of Medicine. (2002, March). Unequal treatment: Understanding racial and ethnic disparities in healthcare. Washington, DC: National Academy Press.

Janjan, N. A. (1997). Radiation for bone metastases: Conventional techniques and the role of systemic radiopharmaceuticals. *Cancer Supplement, 80,* 1628-1643.

Jemal, A., Clegg, L., Ward, E., Ries, L., Wu, X., Jamison, P. et al. (2004). Annual report to the Nation on the status of cancer, 1975-2001, with a Special feature regarding survival. *Cancer, 101*(1), 3-27. Retrieved on March 2, 2005, from Wiley InterScience database (DOI 10.1002/cncr.20288).

Johnson, C. H. (Ed). (2004). The SEER coding and staging manual-2004. (4th ed.). Bethesda, MD: National Cancer Institute, NIH Pub. No. 04-5581

Kücük, N. Ö, İbis, E., Aras, G., Baltaci, S., Özalp, G., Bedük, Y. et al. (2000). Palliative analgesic effect of Re-186 HEDP in various cancer patients with bone metastases. *Annals of Nuclear Medicine, 14,* 239-244.

Li, C., Malone, K. & Daling, J. (2003). Differences in breast cancer stage, treatment, and survival by race and ethnicity. *Arch Intern Med, 163*, 49-56.

McCance, K. & Huether, S. (1998). Pathophysiology – The biologic basis for disease in adults and children. (3rd ed.). St. Louis: Mosby-Year Book, Inc

McLaughlin, C., Hotes, J., Wu, X., Lake, A., Roney, D., Firth, R. et al. (Eds). (2004, April). Cancer in North America, 1997-2001, Volume Two: Mortality. Springfield, Illinois: North American Association of Central Cancer Registries (NAACCR).

National Cancer Institute. (n.d.). About SEER. Retrieved on February 7, 2005, from http://www.seer.cancer.gov/about/

National Comprehensive Cancer Network. (2004a). Clinical practice guideline in oncology – v.1.2004: Cancer pain. Retrieved on March 12, 2005 from http://www.nccn.org/professionals/physician_gls/f_guidelines.asp.

National Comprehensive Cancer Network. (2004b). Clinical practice guideline in oncology – v.1.2004: Palliative care. Retrieved on March 12, 2005 form http://www.nccn.org/professionals/physician_gls/f_guidelines.asp.

National Institute of Neurological Disorders and Stroke & National Institute of Health. (2001). Pain – Hope through research. Retrieved on February 10, 2004 from http://www.ninds.nig.gov/health_ and medical/ pubs/pain.htm?format=printable.

Pain Management. (2003, October 3). New publication helps women understand pain. *Women's Health Weekly,* 103-104.

Paice, J. A., Muir, J. C. & Shott, S. (2004). Palliative care at the end of life: Comparing quality in diverse settings. *American Journal of Hospice & Palliative Care, 21,* 19-26.

Shambaugh, E., Weiss, M. & Axtell, L. (Ed.). (1977). Summary staging guide – Cancer surveillance epidemiology and end results reporting. Bethesda, MD: U.S. Department of Health, Education, and Welfare • National Institute of Health.

Shenkier, T., Weir, L., Levine, M., Olivotto, I., Whelan, T. & Reyno, L. (2004). Clinical practice guidelines for the care and treatment of breast cancer: 15. Treatment for with stage III or locally advanced breast cancer. *Canadian Medical Association Journal, 170,* 983-994.

Smith, H., Navani, A. & Fishman, S. (2004). Radiopharmaceuticals for palliation of painful osseous metastases. *American Journal of Hospice & Palliative Medicine, 21,* 303-311.

Surveillance, Epidemiology, and End Results (SEER) Program. (2004a, April). Public Use Data (1973-2001), (www.seer.cancer.gov), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, based on the November 2003 submission.

Surveillance, Epidemiology, and End Results (SEER) Program. (2004b, April). (www.seer.cancer.gov) SEER*Stat Databases: Incidence - SEER 11 Regs + AK Public-Use, Nov 2003 Sub for Expanded Races (1992-2001) and Incidence - SEER 11 Regs Public-Use, Nov 2003 Sub for Hispanics (1992-2001), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, based on the November 2003 submission.

Surveillance, Epidemiology, and End Results (SEER) Program. (2004c, April). (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Public-Use With State, Total U.S. for Expanded Races/Hispanics (1990-2001), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

The North American Association of Central Cancer Registries. (n.d.) Welcome to NACCR, Inc. Retrieved from on February 11, 2005 from http://www.naaccr.org.

What to do about pain. (n.d.). *A Harvard Health Publications Special Report,* 36-39.

Young, J. L., Roffers, S. D., Ries, L. A., Fritz, A. G. & Hurlbut, A. A. (2000). Seer summary staging manual – 2000: Codes and coding instructions. Bethesda, MD, 2001: National Cancer Institute, NIH Pub. N. 01-4969.

Zangwill, M. (2004). Hidden risk of HPV. *Cure (Winter)*, 29-35.