

Cancer Survivorship: A Teachable Moment

Patricia Robinson, MD
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Cancer as a Chronic Disease

- Cancer is a chronic disease/condition
- Health care is permanently altered
- Personal relationships change
- Adaptations are made to routines and work

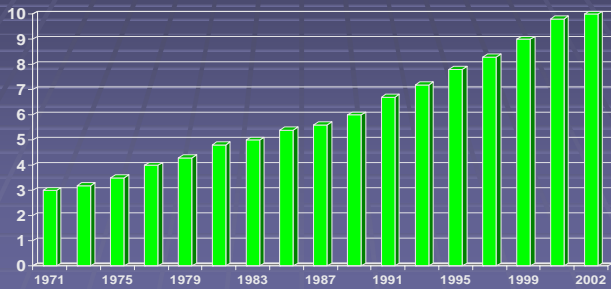
Why Cancer is Different from other Chronic Diseases

- Complex
 - Multi-modal
 - Multidisciplinary
 - Toxic
 - Expensive
 - Different goals
 - Often occurs in isolation from primary health care
- Patty Ganz, ASCO, 2004

Cancer Control Continuum

Prevention	Early Detection	Diagnosis	Treatment	Survivorship	End of life care
Tobacco control Diet Physical activity Sun exposure Virus exposure Alcohol use Chemoprevention	Cancer screening Awareness of cancer signs and symptoms	Oncology c/s Tumor staging Patient counseling and decision making	Chemotherapy Surgery Radiation therapy Symptom management Psychosocial care	Long term follow up Late effects management Rehabilitation Coping health promotion	Palliation Spiritual issues Hospice

Estimated Number of Cancer Survivors in the United States (1971-2002)

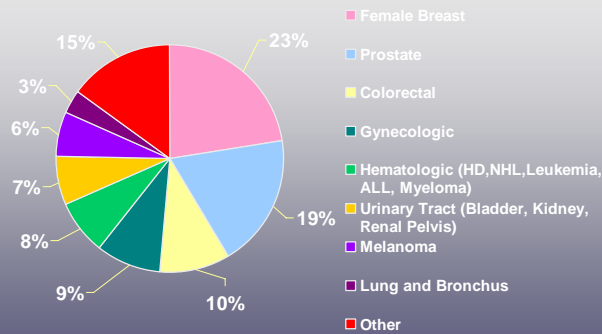


Ries LAG, 2005

Why has Survival Improved?

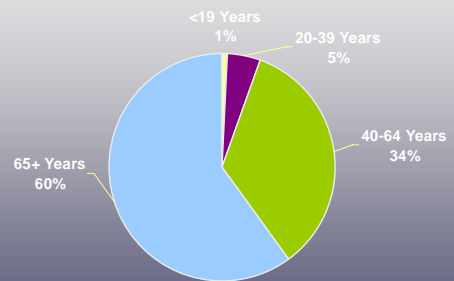
- **Improved screening and early detection**, such as mammography for breast cancer, the prostate specific antigen (PSA) test for prostate cancer, the Pap test for cervical cancer, and colonoscopy for colorectal cancer
- **Improvements in treatment**
- **More effective treatment of side effects**, making it possible to give patients higher, more effective doses of cancer drugs
- The development of **targeted therapies**, which are more specific and less toxic than standard chemotherapy

Estimated Number of Cancer Survivors in the U.S. Diagnosed with Cancer on January 1, 2004 by Site (N = 10.8 M)



Data source: Ries LAG, Melbert D, Krapcho M, Mariotto A, Miller BA, Feuer EJ, Clegg L, Horner MJ, Howlader N, Eisner MP, Reichman M, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2004. National Cancer Institute. Bethesda, MD. http://seer.cancer.gov/csr/1975_2004/, based on November 2006 SEER data submission, posted to the SEER web site, 2007.

Estimated Number of Cancer Survivors in the U.S. on January 1, 2004 by Current Age (Invasive/1st Primary Cases Only, N=10.8M survivors)



Data source: Ries LAG, Melbert D, Krapcho M, Mariotto A, Miller BA, Feuer EJ, Clegg L, Horner MJ, Howlader N, Eisner MP, Reichman M, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2004. National Cancer Institute. Bethesda, MD. http://seer.cancer.gov/csr/1975_2004/, based on November 2006 SEER data submission, posted to the SEER web site, 2007.

The Institute of Medicine

- The Institute of Medicine (IOM) is one of the United States National Academies and is a not-for-profit, non-governmental American organization chartered in 1970 as a part of the National Academy of Sciences.
- Its purpose is to provide national advice on issues relating to biomedical science, medicine, and health.
- It works outside the framework of the government to provide independent guidance and analysis. It relies on a volunteer workforce of scientists and has a formal peer review system.

IOM Recommendations

- **Prevention**
- **Surveillance**
- **Intervention**
- **Coordination**

Prevention

- Diet
 - Complementary/Alternative medicines
- Exercise
- Spirituality
- Clinical Trials

Diet and Prevention

- As scientific research progresses, the evidence that dietary patterns, foods, nutrients, and other dietary constituents are closely associated with the risk for several types of cancer becomes more compelling.
- It is not yet possible to provide quantitative estimates of the overall risks, it has been estimated that 35 percent of cancer deaths may be related to dietary factors
 - Doll and Peto, 1981

Diet and Prevention

- Diets high in fat have been linked to increased risk of various cancers, particularly breast, colon, prostate, and possibly pancreas, ovary, and endometrium.
- Studies of populations in countries consuming high-fat diets compared to low-fat diets have consistently shown higher incidence and mortality rates for breast, colon, and prostate cancer.
- USDHHS, 1988; National Research Council, 1989

Vitamin D deficiency

- **Controversial**
- Earlier research suggested vitamin D may help prevent prostate, breast and especially colon cancer. In lab and animal tests, vitamin D stifles abnormal cell growth, curbs formation of blood vessels that feed tumors and has many other anti-cancer effects.
- While the vitamin is found in certain foods (*fish, fortified milk*) and supplements, most don't contain the best form, D-3, and have only a modest effect on blood levels of the nutrient.

Vitamin D deficiency

- Breast cancer patients with low levels of vitamin D were much more likely to die of the disease or have it spread than patients getting enough of the nutrient .
- Only 24 percent of women in the study had sufficient blood levels of D at the time they their breast cancer was diagnosed. Those who were deficient were nearly twice as likely to have their cancer recur or spread over the next 10 years, and 73 percent more likely to die of the disease.

Exercise and Prevention

- Cancer survivors frequently suffer from fatigue and loss of physical performance.
- Several studies have demonstrated that exercise improves physical performance and decreases fatigue.

Exercise and Prevention

- A prospective, observational study of 573 women with stage I to III colorectal cancer, studied colorectal cancer-specific and overall mortality according to predefined physical activity categories before and after diagnosis and by change in activity after diagnosis.

▪ *Journal of Clinical Oncology*, Vol 24, No 22 (August 1), 2006: pp. 3527-3534

Exercise and Prevention

- The study demonstrated that increasing levels of exercise after diagnosis of nonmetastatic colorectal cancer reduced cancer-specific mortality (P for trend = .008) and overall mortality (P for trend = .003), when compared with women who engaged in less physical activity.
- Prediagnosis physical activity was not predictive of mortality.

Exercise and Prevention

- The pattern of the association between physical activity and breast cancer risk is somewhat different.
- Most studies on breast cancer have focused on postmenopausal women.
- A recent study from the Women's Health Initiative found that physical activity among postmenopausal women at a level of walking about 30 minutes per day was associated with a 20 percent reduction in breast cancer risk.
- This reduction in risk was greatest among women who were of normal weight. For these women, physical activity was associated with a 37 percent decrease in risk. The protective effect of physical activity was not found among overweight or obese women.

Clinical Trials and Prevention

- MAP3-Randomized phase III study of exemestane versus placebo in post-menopausal women at increased risk of developing breast cancer.
- Eligibility
 - >50 years of age
 - >35 years of age
 - Gail score of > 1.66%
 - Have a history of ADH, LCIS
 - Have had prior ductal carcinoma in situ treated with mastectomy +/- tamoxifen completed > 3 months prior to randomization.

Surveillance: Second Malignancies

- After treatment concludes, cancer survivors of all ages face the risk of their cancer returning or development of a second cancer.

Second Malignancies

- Cancer survivors have almost twice the risk of developing a second cancer as the general population has of developing cancer in the first place.
- Overall, cancer survivors have a 14% higher risk of developing a new malignancy than would have been expected in the general population.

Second Malignancies

- One reason that cancer survivors are more likely to develop another cancer could be due to the same risk factors that were linked to the first cancer, such as smoking or specific genetic conditions.
- Another cause of second cancers is the treatment for the first cancer, including chemotherapy, radiation therapy, and bone marrow transplantations.

Risk Factors

- **Hereditary factors**
- **Tobacco**
 - 440,000 people in the United States die from tobacco related diseases annually
 - 38,000 non-smokers die from environmental tobacco
- **Alcohol use/abuse**
- **Low fruit and vegetable intake**
 - Research is discovering that intake of fruits, vegetables, and cereal grains may interfere with the process of developing cancer of the oral cavity, larynx, esophagus, stomach, colon, lung, prostate, and rectum.
- www.Cancer.gov

Risk Factors

- **Obesity**
 - Risk factor for breast, colon, uterine
 - In 2002, about 41,000 new cases of cancer in the United States were estimated to be due to obesity. This means that about 3.2 percent of all new cancers are linked to obesity
 - A recent report estimated that, in the United States, 14 percent of deaths from cancer in men and 20 percent of deaths in women were due to overweight and obesity
- **Exogenous estrogens**
- **Chronic viruses**
 - Liver
 - Leukemia (*some forms*)
 - Cervical
 - Nasopharyngeal
- **Chronic immunosuppression**

Current Cancer Screening Recommendations

- **Annual mammogram**
 - Women age 40 and older should have a screening mammogram every year, and should continue to do so for as long as they are in good health.
 - Women in their 20s and 30s should have a clinical breast exam (CBE) as part of a periodic (regular) health exam by a health professional preferably every 3 years. After age 40, women should have a breast exam by a health professional every year.
 - Women at high risk (greater than 20% lifetime risk) should get an MRI and a mammogram every year.
- **Colonoscopy**
 - Starting at age 50, every 1-10 years depending on the test your doctor uses
- **PAP**
 - Starting at age 20, yearly
 - After age 30, every one to three years, depending on the test your doctor uses and past results
- **PSA**
 - Starting at age 50 ask your doctor about the pros and cons of testing

Lung Cancer Screening

- The benefit of screening for lung cancer has not been established in any group, including asymptomatic high-risk populations such as older smokers.
- The balance of harms and benefits becomes increasingly unfavorable for persons at lower risk, such as nonsmokers.

Ovarian Cancer Screening

- The effectiveness of routine screening of asymptomatic women using pelvic examination, abdominal or vaginal ultrasound or serum carcinoembryonic antigen (CEA-125) has not been established.
- ACS states that women with a high risk of epithelial ovarian cancer, such as those with a very strong family history of the disease, may be screened with transvaginal ultrasound and CA-125.

Intervention: Care Plan for Survivorship

- Patients completing primary treatment should be provided with a comprehensive care summary and follow up plan
- Cancer type, treatments received and potential consequences
- Content of recommended follow up
- Recommendations regarding preventive practices and how to maintain health and well being
- Information on legal protections regarding employment and health insurance
- Availability of psychosocial services in the community

Providers of survivorship care: supply, education and training

- The number of cancer survivors has increased over the past 30 years; however, the supply of health care providers has not kept paced.
- The demand for medical oncologists is expected to rise 48% between 2005 and 2020. In contrast, the supply of services provided by oncologists is expected to grow more slowly, approximately 14%.
 - aging United States population with a correlative increased incidence of breast cancer
 - increased numbers of cancer survivors.

JCO. 2008

Comparing PCP to Oncologist

- 968 breast cancer survivors who had completed adjuvant therapy and were between 9 and 15 months after diagnosis were prospectively studied.
- The patients were randomized to follow up with the medical oncologist (N=483) or the family practitioner (N=485) (the family practitioner was provided an educational follow up guideline).
- The primary endpoint was the rate of recurrence-related serious clinical events.
- There was no statistical difference detected between the family practice cohort (54 recurrences (11.2%) and 29 deaths (6.0%)) versus the medical oncology cohort (64 recurrences (13.2%) and 30 deaths (6.2%)).
- In addition, there was no difference in quality of life measurements.

Grunfeld. et al

Intervention: Research Initiatives

- Research is needed to improve understanding of mechanisms of **late effects** and **long term effects** experienced by cancer survivors and interventions to alleviate symptoms and improve function.

Late and Long Term Effects

- Long term effects refer to any side effects or complications of treatment for which a cancer patient must compensate; also known as persistent effects, they begin during treatment and continue beyond the end of treatment.

▪ Aziz and Rowland 2003

Late and Long Term Effects

- Late effects refers to unrecognized toxicities that are absent or subclinical at the end of therapy and become manifest later with the unmasking of unseen injury because of any of the following factors:
 - developmental processes
 - failure of compensatory mechanisms with the passage of time
 - organ senescence

▪ Aziz and Rowland 2003

Late and Long Term Effects

- There is limited information on the prevalence of late effects , but there is a general recognition that they have become more common, largely as a result of the more frequent use of complex cancer interventions, often combinations of surgery, chemotherapy, radiation and hormone treatments.

Physical Effects

- Cardiorespiratory difficulties, such as shortness of breath, fibrosis (scarring) of the lungs, and congestive heart failure
- Fatigue (extreme tiredness), which can persist for a long time after treatment
- Cognitive dysfunction ("chemo brain"), including difficulty concentrating or finishing tasks, short-term memory problems, confusion, and an inability to think clearly
- In men: impotence (the inability to have or maintain an erection), infertility, and incontinence (inability to control the flow of urine from the bladder)

Physical Effects cont.

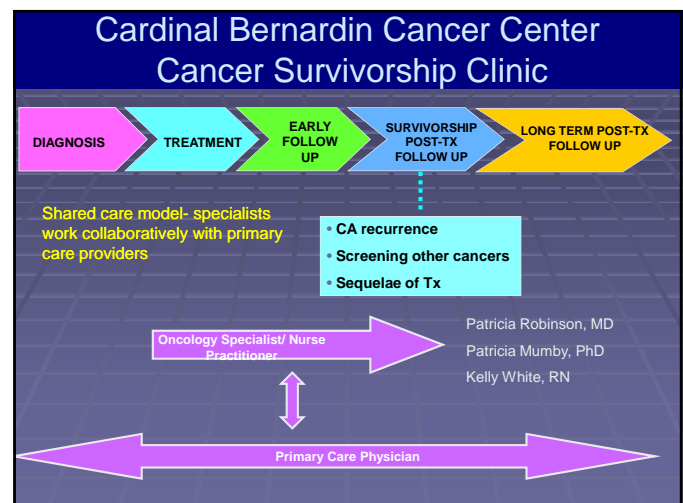
- In women: premature menopause, infertility, vaginal dryness, loss of libido (sexual desire), pain during sexual intercourse
- Chronic (long-term) pain
- Kidney damage
- Lymphedema (swelling caused by extra fluid in the tissue, usually in the arms or legs)
- Osteoporosis (brittle bones) and fractures, especially in survivors treated with hormone therapies (such as breast and prostate cancers)
- Second cancers
- Neuropathy (tingling or numbness in the hands or feet)

Radiation Complications

- Radiation necrosis
- Cognitive dysfunction/leukoencephalopathy
- Mild/moderate neuropsychological impairment
- Radiation-induced dementia
- Radiogenic tumors
- Vascular abnormalities
- Endocrinopathies
- Delayed complications of spinal cord and peripheral nerve irradiation

Coordination: Models of Care

- **Shared care model- specialists work collaboratively with primary care providers.**
- Nurse led model in which nurses take responsibility for cancer related follow up care with oversight from physicians.
- Specialized survivorship clinics in which multidisciplinary care is offered at one site.



Cardinal Bernardin Cancer Survivorship Clinic

- A specialized clinic for survivors of adult cancers in which multidisciplinary care is offered at one site.
- We serve patients that have completed active cancer therapy and are currently under observation by their medical oncologist or primary care physician and deemed low risk for recurrence.

Outline of Clinic Visit

- Intake and needs assessment -Kelly White, RN
- Psychological assessment-Patricia Mumby, PhD
- Detailed history and physical examination
- Education on the long term effects of treatment
- Coordination with primary care physician
- Referrals to appropriate sub-specialists
- Prescription of care, screening and follow up

Expanded Patient Services

- Referrals to subspecialist for evidence based screening tests
- Maximize use of current programs and services
 - Support groups and psychoeducational programs
 - Nutrition counseling
 - Smoking cessation
 - Physical rehabilitation

Extracurricular Activities

- **Outreach Programs**
- **Core Lecture Series**
 - Late and Long term Effects of Cancer Treatment
 - Nutrition/Weight
 - Psychosocial challenges of Survivorship
 - Patient
 - Care givers/family
 - Spirituality and Survivorship
 - Financial Health for Survivors
 - Cancer Genetics and Prevention
 - Health Maintenance: Cancer Screening and Risk Factor Identification
 - Fertility and Chemotherapy
- **Resource and Education Center**

CBCC Cancer Survivorship Clinic

- The Cancer Survivorship Clinic is dedicated to addressing the concerns of cancer survivors.
- The goal is to address the surveillance and prevention needs of adult cancer survivors; to improve the quality of life through psychological and physical examination; and to empower cancer survivors and their family members and care givers through education and advocacy.

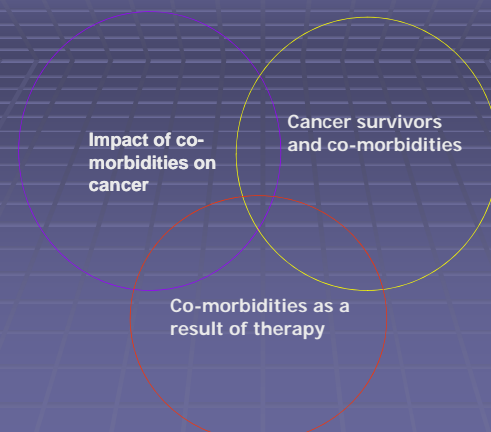
Everyday Choices for Everyday Life

- The American Cancer Society, American Diabetes Association and American Heart Association have partnered together to inform and educate people about *Everyday Choices for a Healthier Life*.
- www.everydaychoices.org
- **Eat right!** **Don't smoke!**
- **Get active!** **See your doctor!**

Co-morbidity Monitoring in Cancer Survivors

Patricia Robinson, M.D.

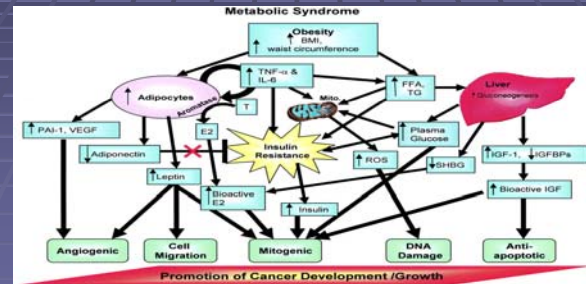
Outline



Impact of co-morbidities on cancer

- Metabolic syndrome
 - Obesity
 - Hypertension
 - Hypercholesterolemia
 - Hyperglycemia

Factors Linking the MS with Cancer Development



Link between metabolic syndrome and Cancer

- Breast cancer patients with metabolic syndrome (vs. without metabolic syndrome)
 - larger tumors
 - later stage of disease
 - lymphovascular invasion
 - axillary node involvement
- Baseline metabolic syndrome (3 components vs. 0 components) had a positive association with age-adjusted and gender-adjusted colorectal cancer incidence (RR, 1.49; 95%CI,

Hellmuth et al

Ahmed, et al

Overweight, Obesity, and Mortality from Cancer in a Prospectively Studied Cohort of U.S. Adults

Study Overview

- Excess weight increases the risk of death from all causes and from cardiovascular disease
- Some evidence suggests that adiposity also increases the risk of death from cancer

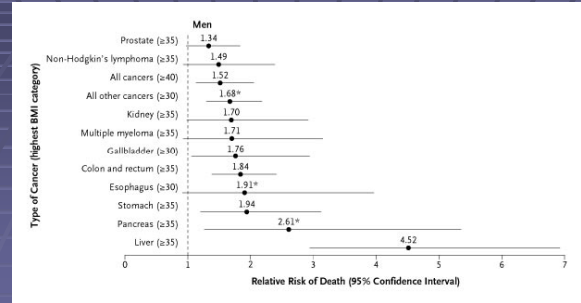
Calle

Obesity and Mortality

- Obesity contributes to the risk of dying not only from heart disease and diabetes but also from cancer
- The authors estimate that 90,000 deaths from cancer could be prevented every year in the United States if all adults could maintain a body-mass index (BMI) of less than 25 kg/m².

Cowey, et al

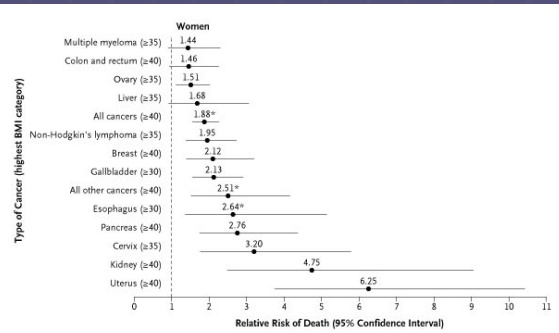
Summary of Mortality from Cancer According to Body-Mass Index for U.S. Men in the Cancer Prevention Study II, 1982 through 1998



Calle, E. et al. N Engl J Med 2003;348:1625-1638



Summary of Mortality from Cancer According to Body-Mass Index for U.S. Women in the Cancer Prevention Study II, 1982 through 1998



Calle, E. et al. N Engl J Med 2003;348:1625-1638



Conclusions

- Increased body weight was associated with increased death rates for all cancers combined and for cancers at multiple specific sites.

Diabetes and cancer

- Higher insulin levels may contribute to increased tumor growth.
- In recent epidemiologic studies, insulin-like growth factor 1 (IGF-1) has been associated with increased risk of colorectal cancer.
- 10-20% increased risk of breast cancer in patients with type II diabetes mellitus.
- Similar mechanisms may account for associations observed in epidemiologic studies between diabetes and cancer of the breast and prostate.

Dyslipidemia, Hypertension and Cancer

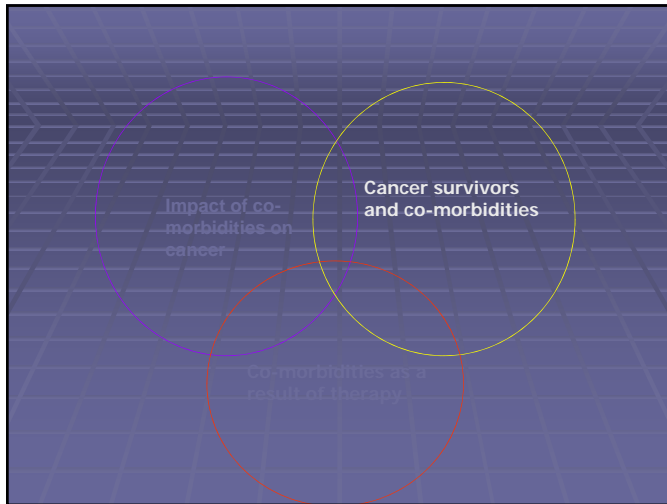
- Currently data supports an association with elevated HDL levels and breast cancer in post menopausal women regardless of BMI.
- Hypertension has been shown to be associated with general cancer mortality

Alcohol use and abuse

- Previous studies have linked alcohol intake with an increased breast cancer risk.
- Alcohol may change the way the body metabolizes estrogen. Therefore, regular use of alcohol is thought to increase the risk of estrogen receptor positive breast cancer by increasing blood estrogen levels.

Alcohol use and abuse

- Women who drank a glass or two a day faced a 21% increased risk of breast cancer.
- Those who drank more than two drinks a day were 37% more likely to develop breast cancer.
- The risk was much greater in menopausal women:
- Menopausal women who drank a half glass of wine daily increased their chance of breast cancer by 18%.



- Leading cause of death in cancer survivors following recurrence of the primary cancer is cardiovascular disease.
- Increased risk of a second primary cancer

Reductions in all-cause, cancer, and coronary mortality in statin-treated patients

- 37% reduction in all cancer mortality (95% CI = 21–50).
- A site-specific analysis showed that after this date there were significant reductions:
 - 73% for fatal cancers of the respiratory and intrathoracic organs
 - 78% for lymphatic and hematopoietic cancer
 - 49% for genitourinary cancers
 - 39% for digestive and peritoneal cancers.

Neil, et al

- In contrast to obesity and weight gain being a risk factor for several types of cancers and an independent poor prognostic variable, weight loss can improve survival outcomes.



Co-morbidities as a result of therapy

- It is now recognized that cancer survivors may experience a variety of long term complications from their cancer care.
- Many health care providers may not be aware of the potential problems.

Co-morbidities as a result of therapy

- Premature ovarian failure
- Osteopenia/osteoporosis
- Cardiomyopathy
- Lung fibrosis
- Myelodysplastic syndrome/ acute leukemia
- Neuropathy
- endocrine damage
- lymphedema

Summary of Care

- In order to best stratify ones risk of a late or long term complication from a cancer therapy the diagnosis, age at diagnosis, therapeutic intervention should be clearly documented in the chart.

Summary of Care

- Regular monitoring of health status after cancer treatment is recommended.
 - Permitted the timely diagnosis and treatment of long term complications of cancer treatment
 - Provided the opportunity to institute preventive strategies, such as diet modification, tobacco cessation, exercise
 - Facilitated screening for a second primary cancer
 - Detection of physical or psychological dysfunction
 - Timely diagnosis and treatment of recurrent cancer

Conclusion

- Although there has been research on the long term complications of cancer interventions, there are no comprehensive guidelines to follow in order to best manage this unique patient population.

Conclusion

- Optimal follow up of survivors includes both ongoing monitoring and assessment.
- It requires a careful observation and optimal utilization of resources.