

# Care of the Cancer Survivor

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No Disclosure or Conflicts

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## Disclosure

- Dr. Kimberly Peairs has no conflict of interest, financial agreement, or working affiliation with any group or organization.

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## Learning Objectives

- Understand the therapeutic exposures and potential late effects from cancer treatment;
- Distinguish differences in cancer survivorship outcomes by gender, ethnicity, and socio-economic status;
- Understand the neurocognitive and psychosocial effects of cancer treatment on survivors;
- Gain knowledge of referrals to appropriate community resources in patients who are transitioning from active care to life beyond cancer survivorship care.

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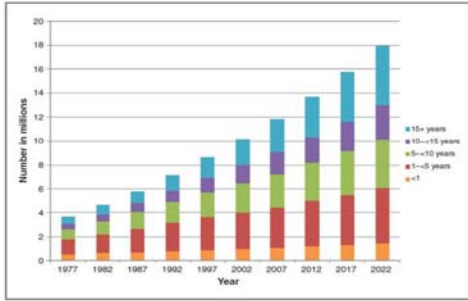
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### Projected Number of Cancer Survivors ↑



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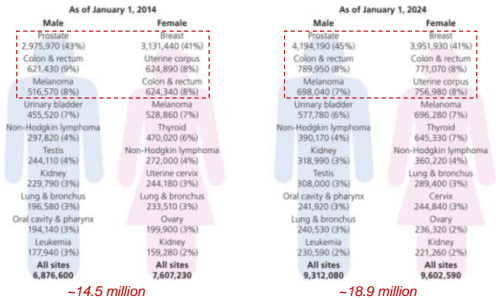
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### Estimated Number of US Cancer Survivors by Site



De Santis, CA Cancer J Clin 64:252, 2014

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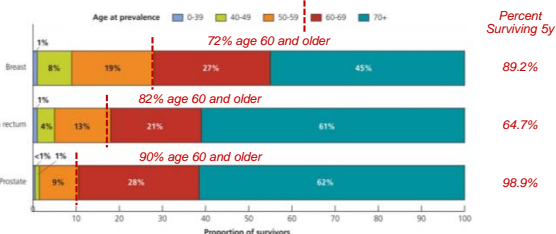
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### Age Distribution of Cancer Survivors 2014



adapted from De Santis, CA Cancer J Clin 64:252, 2014 and from seer.cancer.gov

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## Hurdles in Caring for Cancer Survivors!



- Cancer survivors are diverse!!!
- Some cancers rarely seen in primary care, so can't have enough expertise
- Inadequate information about the previous cancer and/or its treatment
- Lack of knowledge and confidence about survivorship care
- Patient lack of confidence in PCP knowledge
- Competing demands on PCP time
- Numerous specialists leading to gaps in communication/coordination
- Shortage!

Duffy Land, 2006; Kadan-Lottick, 2002; Mao 2009; Del Giudice 2009; Bober, 2009; Kantsiper 2009; Potosky 2011

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## Essential Components of Survivorship Care

- Prevention of recurrent & new cancers, and of other late effects
- Surveillance
  - Cancer spread, recurrence, or second cancers
  - Assessment of medical and psychosocial late effects
- Intervention for consequences of cancer and its treatment
  - Medical problems (e.g., lymphedema, sexual dysfunction); symptoms (e.g., pain, fatigue); psychological distress (survivors, caregivers); employment, insurance, and disability
- Coordination between specialists and primary care providers to ensure that all of the survivor's health needs are met.

*Cancer Patient to Cancer Survivor: Lost in Transition (IOM 2005)*

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## Risk-stratified Model of Survivorship Care

- Survivors differ by:
  - Risk of recurrence
  - Risk of ongoing and late toxicities of therapy
  - Ongoing therapies
  - Comorbid conditions
  - Psychosocial needs
  - Risk of second primary cancers
  - Genetic predisposition
  - Lifestyle
- Content and intensity of survivorship care should differ based on different needs of different survivors

McCabe Seminars in Oncology 2013  
Oeffinger ASCO Educational Book 2014

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## Models of Primary Care in Survivorship

- “Oncogeneralist”
  - Continuity care in cancer center
  - Consultative care in cancer center
- Primary care providers with cancer center relationship
- Primary care providers without close cancer center relationship

Nekhlyudov. The Oncologist. 2014

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## Shared-Care Model

- Cancer care domain
  - Short/mid-term surveillance
  - Acute/short term complications
  - Screening for 2<sup>nd</sup> cancers
- Primary care domain
  - Preventive services (diabetes, heart disease, osteoporosis, vaccinations, ...)
  - Screening for 2<sup>nd</sup> cancers
  - Long-term surveillance (if necessary)
  - Long-term complications (if applicable)

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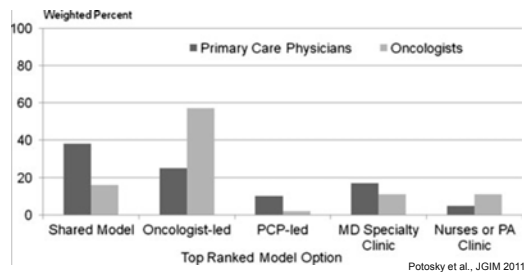
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## Preferred Model for Care of Cancer Survivor: the Physicians' Preferences



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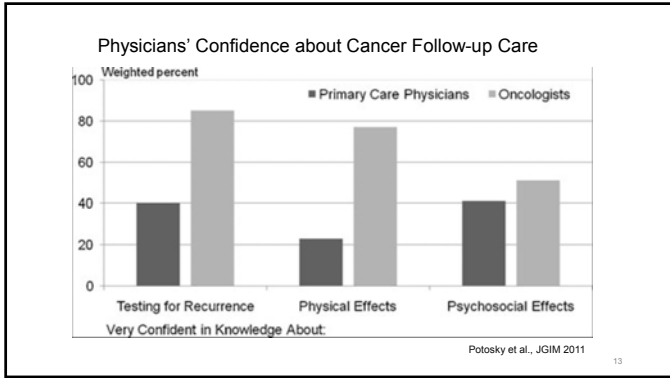
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### Delivery of Survivorship Care by Primary Care Physicians: The Patient's Perspective

Breast cancer survivors' rating of PCP-related survivorship care:

- *Strongly endorsed:*
  - General Care (78%), Psychosocial support (73%), health promotion (73%)
- *Less knowledgeable:*
  - Cancer follow-up (50%), late effects of cancer therapies (59%), treating symptoms related to cancer (41%)
- Only 28% felt PCPs and oncologists communicated

Mao J. et al., J Clin Oncol 2009

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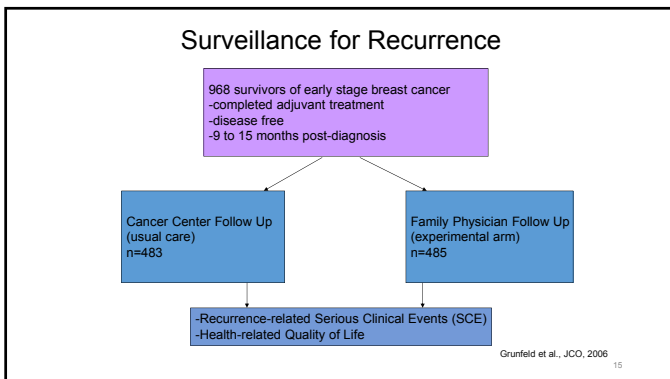
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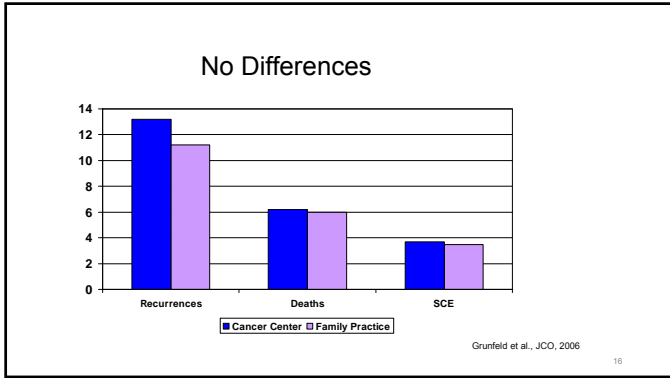
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### Cancer Survivorship Education

- Acknowledge cancer survivorship needs
- Understand “best evidence” and/or “best practices” in the following aspects of cancer survivorship care:
  - (a) cancer screening and surveillance
  - (b) late effects monitoring and co-morbidities
  - (c) psychosocial wellbeing and care
  - (d) prevention and health promotion.

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### QUESTION

A patient presents to you as her new PCP. She is 37 yo with history of Wilms Tumor dx at age 5. She was treated with vincristine, cytoxan, adriamycin, as well as radiation to the lungs and left chest and abdomen.

She of the following is she at higher risk compared to non-cancer patient?

- A. Bladder cancer
- B. Colorectal cancer
- C. Aortic valve disease
- D. Basal cell carcinoma
- E. All of the above

Henderson TO et al. Secondary Gastrointestinal Cancer in Childhood Cancer Survivors: A Cohort Study. *Annals Intern Med* 2012; 156: 757-766.  
 Nottaga, K et al. Secondary Colorectal Carcinoma after Childhood Cancer. *J Clin Oncol* 2012; 30: 2552-2558  
 Watt TC et al. Radiation-Related Risk of Basal Cell Carcinoma: A Report from the Childhood Cancer Survivor Study. *JNCI* 2012; 104: 1240-1250.

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## Late Effects of Cancer Treatment

- Childhood Cancer Survivor Study
  - Retrospective cohort study
  - Adults diagnosed with childhood cancer 1970-1986 vs. non-cancer siblings
- Oeffinger, et al. (NEJM, 2006)
  - 10K survivors vs. 3K siblings
  - Severity score for chronic health conditions
    - CHF, second malignancy, joint replacement, cognitive dysfunction, CAD, CVA, renal failure, hearing or vision loss and ovarian failure (grade 3 or 4)
    - 5x more common among survivors than siblings

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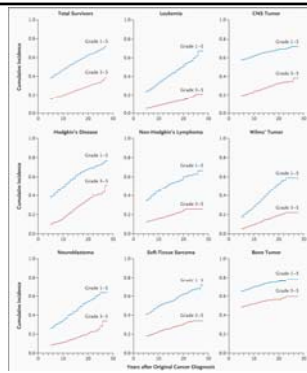
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## Cumulative Incidence of Chronic Health Conditions in Adult Survivors of Pediatric Cancer



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## Risk of Secondary Cancers

- Chemotherapy
  - Early to late risk of leukemias, solid tumors
  - Increased risk with higher drug doses, longer treatment time, and higher dose intensity.
- Radiation therapy
  - Most are not seen for at least 10 years after radiation.
    - Dose of radiation
    - Area treated
    - Age at treatment
    - Chemotherapy
    - Smoking

<http://www.cancer.org/acs/groups/cid/documents/webcontent/002043-pdf.pdf>

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## Secondary Cancers

**Table 2.** Subsequent Solid Tumors After Treatment for Adult-Onset Cancer

First Primary Cancer	Second Solid Tumors for Which Increased Risks Have Been Reported	(Historical) Radiotherapy Fields	SMN With Statistically Significant Radiation Dose-Response Relationships
Hodgkin's lymphoma	Cancers of breast,* lung,* head and neck, esophagus, stomach, pancreas, colon/rectum,* kidney, thyroid, brain, soft tissue/bone, female genital, melanoma**	Total nodal for mantle, para-aortic, and pelvic irradiation Subtotal nodal for mantle and para-aortic irradiation	Breast, <sup>22</sup> lung, <sup>23</sup> stomach <sup>24</sup>
Testicular cancer	Cancers of lung, thyroid, esophagus, stomach, pancreas, colon/rectum, kidney, bladder, soft tissue/ <sup>†</sup> bone <sup>†,25,26</sup>	Mediastinal irradiation Para-aortic and pelvic irradiation	Stomach <sup>27</sup>
Breast cancer	Cancers of contralateral breast, <sup>28,29</sup> lung, <sup>31,32</sup> esophagus, <sup>30</sup> soft tissue <sup>31,32,33</sup>	Tangential with or without supraclavicular and axillary irradiation	Contralateral breast <sup>27</sup>
Cervical cancer	Cancers of bladder, kidneys, rectum, corpus uteri, ovaries <sup>34,35</sup>	Pelvic irradiation	Rectum, <sup>36</sup> bladder, <sup>36</sup> all female genital sites combined <sup>37</sup>
Prostate cancer	Cancers of colon/rectum, bladder, soft tissue <sup>38-43</sup>	Pelvic/prostatic irradiation	

NOTE: Restricted to survivors of adult-onset cancer. Relationships between radiation dose and subsequent cancers of thyroid gland<sup>39</sup> and central nervous system<sup>40</sup> have been reported for adult survivors of childhood cancer.  
Abbreviation: SMN, second malignant neoplasm.  
\*Individuals with Hodgkin's lymphoma who have received radiation that encompassed the breast, lung, or colon/rectum should be considered at moderate risk for those neoplasms and should be screened accordingly.

Wood ME, et al. Second Malignant Neoplasms: Assessment and Strategies for Risk Reduction. J Clin Oncol 2012; 30: 3734-45. <sup>22</sup>

## Screening For Secondary Malignancies

- Consensus based guidelines (mostly based on children's literature) –  
[www.survivorshipguidelines.org](http://www.survivorshipguidelines.org)  
[www.nccn.org](http://www.nccn.org)
- Early screening than general population based on risk
- Patients and physicians to be vigilant about symptoms!!!

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## Cardiac Outcomes in Adult Survivors of Childhood and Adolescent Cancer

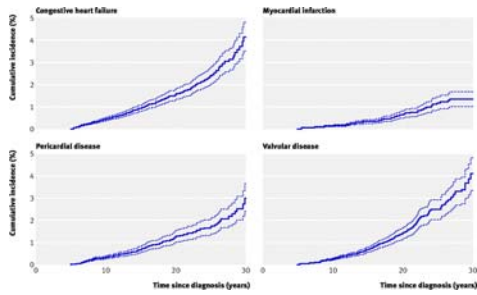
	Survivors	Siblings
Heart failure	1.7%	0.2%
Myocardial infarction	0.7%	0.2%
Pericardial disease	1.3%	0.3%
Valvular abnormalities	1.6%	0.5%

BMJ 2009;339:4606

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### Cardiac Outcomes in Adult Survivors of Childhood and Adolescent Cancer



BMJ 2009;339:4606

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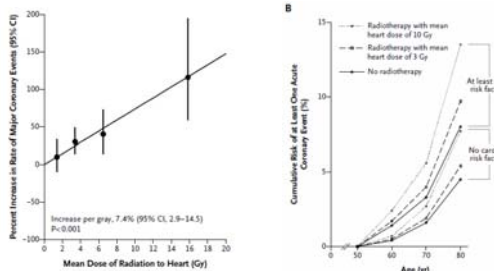
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### Radiotherapy and Coronary Disease



Derby S, et al. N Engl J Medicine 2013; 368:987-98

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### Potential Cardiac Late-Effects of Chemotherapy

- Anthracyclines
  - Late heart failure may present as non-ischemic CM
  - May begin to present in adults 5 yr after treatment
- Risk increased if:
  - <18 or >65 y/o when treated
  - Underlying CAD or HTN
  - Radiation treatment
  - High dose
  - Combination chemotherapy (+ trastuzumab)
- Trastuzumab
  - Cardiac events up to 4.1%
  - Risks: Older age and underlying cardiac dysfunction

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### Is Cardiac Screening Recommended?

- *Van der Pal, et al. J Clin Oncol 2012*
  - Most common cardiac event for childhood survivors was CHF
  - 1 in 8 developed severe heart disease after 30years
  - Highest risk if anthracyclines + radiation
- Screening is recommended for childhood cancer survivors
  - Periodic assessment of LVEF
    - [www-survivorshipguidelines.org](http://www-survivorshipguidelines.org)
- **Adult guidelines...**
  - Risk factor modification!
    - BP control, cholesterol management, tobacco cessation
    - Diabetes and weight control...

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### QUESTION- Breast Cancer

60 year old woman with invasive ductal carcinoma of the breast dx in 2008. Treated with breast conserving surgery, radiation and completed 5 years of tamoxifen. Her oncologist feels that she can be followed by PCP alone. What surveillance do you recommend?

- A. Yearly mammogram
- B. Yearly breast MRI
- C. Blood work, including blood count and chemistries
- D. CA-15-3 tumor marker
- E. All of the above

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### Side Effects from Breast Cancer Treatment

#### Early effects (0-6 months)

- Cytopenias
- Fatigue
- Alopecia
- Pain (musculoskeletal)
- Cancer Induced Peripheral Neuropathy (CIPN)
- Neurocognitive dysfunction



#### Chronic/Late effects (6 months to lifetime)

- Cardiomyopathy
- Chemo-Induced Peripheral Neuropathy
- Neurocognitive dysfunction
- Psychosocial impact
- Second cancers
- Early Menopause (bone health and cardiovascular disease)
- Fertility

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### Common Issues After Breast Cancer Therapy

Problems/Symptoms <small>(adapted from Hayes, NEJM 2007)</small>	Who should be involved?		
	Cancer specialist	PCP	GYN
Bone health	x	x	x
Cardiovascular Health	x	x	
Cognitive function	x	x	
Neuropathy	x	x	
Depression, Fatigue	x	x	x
Cancer Surveillance & Screening	x	x	x
Hot flashes	x	x	x
Lymphedema	x		
Musculoskeletal, Bone Health	x	x	x
Sexual function	x	x	x
Weight gain	x	x	

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### Breast Cancer Treatment Symptoms/Side Effects: Common Behavioral Symptoms

- Sleep disturbance
- Depression
- Cognitive impairment
- Fatigue

Bower J. J Clin Oncol 2008

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### Breast Cancer Treatment Symptoms/Side Effects: **Fatigue**

- Likely multifactorial; Establish severity
- **Treatment options**
  - Nonpharmacologic
    - Psychosocial \*
    - Exercise \*
    - Sleep Therapy
    - Acupuncture
  - Pharmacologic
    - Antidepressants
    - Stimulants? (studies in pts. with advanced ca)

Escalante CP. J Gen Intern Med 2009.

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## Breast Cancer Treatment Symptoms/Side Effects of Endocrine Therapy

### Tamoxifen

- Selective estrogen receptor modulator
- Effective for hormone receptor + cancer
- Slight increased risk of Venous Thromboembolism
- Slight increase risk for Endometrial Cancer
- Increase in Hot Flashes
- Metabolized by cytochrome P450 enzyme, CYP2D6
  - Drug interaction

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## Breast Cancer Treatment Symptoms/Side Effects: Endocrine Therapy

### Aromatase inhibitors (anastrozole, letrozole, exemestane)

- Used if hormone receptor + cancer
- Blocks conversion of androgens to estrogen
- Only used in postmenopausal women

### Side effects:

- Hot Flashes
- Vaginal dryness
- Arthralgias and myalgias
- Transient LFT elevation (AI's)
- Osteopenia or osteoporosis (AI's)

Ewer, M. Gluck S. Cancer 2009 115.  
Burnstein. Breast 2007 16 (3).  
Hong S. JGIM 2009 (Suppl 2):383-8

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## Breast Cancer Treatment Symptoms/Side Effects: Menopausal Symptoms

### Vasomotor symptoms most common

- 20% of breast cancer pts consider stopping endocrine therapy because of symptoms.

### Treatment:

- Venlafaxine 37.5 mg or 75 mg QD\*
- Citalapram 20mg\*
- Paroxetine 7.5mg QD (strong CYP2D inhibitor)
- Gabapentin 300 mg TID\*
- Pregabalin\*
- Clonidine\* (many side effects)

\*Non-FDA indication

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### Breast Cancer Treatment Symptoms/Side Effects: Bone Loss

- Tamoxifen preserves bone density in *post* menopausal
- Tamoxifen increases bone loss in *pre* menopausal
- AI cause increase bone loss in *post* menopausal
- GnRH causes bone loss
- Treatment:
  - Calcium, vitamin D
  - Weight bearing exercise
  - Stop tobacco, etoh
  - Bisphosphonates; utilize Fracture Risk Assessment (FRAX)
  - Zoledronic acid 4mg q6months reduced bone loss if on GnRH +tamoxifen or AI (Gnant et al, 2007)

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### Dexa Scan Monitoring in Women with Cancer

- Women >65
- Women 60-64 y/o with one of the following:
  - FHx of osteoporosis
  - Low body weight
  - Prior non-traumatic fracture
  - Other osteoporosis risk factors (steroids, smoking)
- Postmenopausal women on aromatase inhibitor
- Premenopausal women who develop treatment related premature menopause

Pant, S, Shapiro, CL. Drugs 2008; 68:2591  
Hillner, BE, Ingle, JN et al. J Clin Oncol 2003;20:42

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### Prostate: Common Survivorship Challenges Following Therapy

- Cancer recurrence or secondary malignancies
- Psychological distress of patient and/or care provider
- Sexual dysfunction (impotence)
- Bladder dysfunction (incontinence)
- Bowel dysfunction
- Fatigue
- Bone health
- Cardiovascular risk / metabolic syndrome from androgen deprivation therapy

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### Prostate Cancer Treatment Related Impotence

- After prostatectomy: 60% reported no erections
  - within one year after treatment, about 40-50% of men who undergo nerve-sparing prostatectomy will have returned to their pre-treatment function
- After XRT: 45-55% reported Erectile Dysfunction (less for brachytherapy)
  - little improvement over time
- See JHMI web site for detailed treatment options.
  - [http://urology.jhu.edu/erectileDysfunction/erectile\\_dysfunctions\\_Rehab.php](http://urology.jhu.edu/erectileDysfunction/erectile_dysfunctions_Rehab.php)

Data source: Prostate Cancer Foundation  
[http://www.pcf.org/site/c/leJRIROEpH/b.5836625/k.75D7/Erectile\\_Dysfunction.htm](http://www.pcf.org/site/c/leJRIROEpH/b.5836625/k.75D7/Erectile_Dysfunction.htm)

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### Prostate Cancer Treatment Related Incontinence

- After prostatectomy: 20-30% wore pads for urinary incontinence
- After XRT: 45% reported urinary incontinence
  - the use of pads decreases to 10% after several years
- See JHMI web site for detailed treatment options.
  - [http://urology.jhu.edu/incontinence/urqe\\_incontinence.php](http://urology.jhu.edu/incontinence/urqe_incontinence.php) (for Urge incontinence)
  - [http://urology.jhu.edu/incontinence/stress\\_incontinence.php](http://urology.jhu.edu/incontinence/stress_incontinence.php) (for Stress incontinence)

Data source: Prostate Cancer Foundation  
[http://www.pcf.org/site/c/leJRIROEpH/b.5814053/k.1572/Urinary\\_Dysfunction.htm](http://www.pcf.org/site/c/leJRIROEpH/b.5814053/k.1572/Urinary_Dysfunction.htm)

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### Prostate Cancer Treatment Related Bowel Dysfunction

- After prostatectomy: very rare (2-3%)
- After XRT:
  - After 2 yrs, about 10-20% of men reported having persistent diarrhea
  - Rectal bleeding increased steadily from 5% immediately after treatment to 25% after 2 yrs. (Rates lower with intensity modulated RT (IMRT))
  - After brachytherapy, bowel dysfunction rates are lower and stabilize at around 10%.

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### Prostate Cancer Therapy Related Bone Health

- Androgen Deprivation Therapy (ADT)
  - Increased risk of osteoporosis, vertebral and hip fractures, even after discontinuation
- XRT
  - Increased risk of pelvic fracture (small)
- Recommend screening bone density for men on initiation of ADT or in men with prior treatment with ADT

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### GI malignancies: Common Survivorship Challenges During/Following therapy

- Cancer recurrence
- Second primary cancer following radiation
- Psychological distress
- Pelvic insufficiency fractures
- Genitourinary dysfunction
- Bowel dysfunction, stoma stigmata
- Fatigue
- Peripheral neuropathy (Oxaliplatin)

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### Colorectal Cancer Treatment Related Genitourinary Dysfunction

- Increased risk of urinary and sexual dysfunction with pelvic dissection
- Ureteral injury during surgery <8%
- After Radiation and Surgery
  - 39% GU dysfunction
  - 40% sexual dysfunction
- Risk factors: Preop incontinence, female gender, stoma, nerve damage
- Treatment: Pelvic floor rehab

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### Colorectal Cancer Treatment Related Bowel Dysfunction

- Common after surgery, surgery and radiation, ostomy takedown
  - 13-50% chronic diarrhea
  - 50-90% urgency
  - 40-60% incontinence
  - 40-80% clustering
- Treatment: Therapeutic choices, pelvic floor rehab, undergarment pads, bulking agents/fiber, anti-diarrheals, diet

JCO 2007; 25 and Ann Surg 2007; 246

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### Long-term Outcomes of Head and Neck Cancer

	1 year	2 year	3 year	4 year	5 year
Dysphagia	1.46 (1.24-1.70)	1.15 (0.96-1.38)	<b>0.78 (0.62-0.98)</b>	0.80 (0.61-1.06)	0.59 (0.33-1.03)
Weight loss	1.30 (1.09-1.57)	1.40 (1.13-1.74)	1.31 (1.01-1.71)	1.14 (0.81-1.60)	1.35 (0.69-2.64)
Esophageal stricture	3.84 (2.48-5.94)	5.38 (3.38-8.57)	5.58 (3.22-9.66)	3.43 (1.79-6.56)	2.46 (0.70-8.67)
Gastrostomy tube	0.66 (0.53-0.82)	0.37 (0.28-0.48)	0.30 (0.21-0.44)	0.30 (0.18-0.48)	0.17 (0.06-0.43)
Airway obstruction	1.90 (1.58-2.28)	2.48 (2.01-3.05)	2.67 (2.08-3.42)	3.03 (2.25-4.09)	3.25 (1.83-5.75)
Tracheostomy tube	1.46 (1.15-1.86)	1.38 (1.03-1.84)	1.03 (0.72-1.48)	1.21 (0.77-1.88)	0.40 (0.14-1.11)
Pneumonia	1.75 (1.40-2.18)	2.49 (1.94-3.21)	1.86 (1.36-2.57)	3.41 (2.35-4.94)	5.17 (2.51-10.65)

Gourin et al, Laryngoscope, 2014

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### Question

Exercise has NOT been shown in studies to reduce cancer specific mortality for which tumor types?

- Breast cancer
- Prostate cancer
- Colorectal cancer
- Ovarian cancer
- All of the above
- None of the above

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## Physical Activity and Cancer

Ballard-Barbash et al. *Physical Activity, Biomarkers, and Disease Outcomes in Cancer Survivors: A Systematic Review*, JNCI, 2012, 104:815-840.

- Review Inclusion criteria: RCTs or observational studies of physical activity and cancer specific/all-cause mortality, recurrence
- Mostly observational studies (n = 27)
  - Over half in breast cancer
- All except one published since 2000
- Breast Cancer:
  - No studies found increasing mortality with increasing exercise
  - Decreases in breast cancer specific mortality range from 13 to 51%
    - Almost ½ of studies reported significant "dose response"
  - Benefits from both pre- and post-diagnosis physical activity

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## Physical Activity and Cancer

- Colorectal cancer:
  - Physical activity after cancer diagnosis may reduce cancer specific mortality (45-61%), and death from all causes (23 to 61%)
  - One study examined in the same cohort exercise before and after diagnosis
- Prostate cancer:
  - Physical activity after diagnosis associated with reduced cancer specific all cause mortality
  - Test for trend positive (+ dose response)
- Ovarian cancer:
  - No significant associations between pre-dx activity and mortality, but
  - Suggestion of some benefit for young women (18-30) with early stage disease
  - Borderline significant reduction in all cause mortality for non-obese women (BMI <= 30)

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## Exercise

### What is Recommended ?

- 2.5 hours (150min) of *moderate-intensity* aerobic activity weekly **and**
- 2 or more days of week of muscle-strengthening activities of major muscle groups
- 10 minutes at a time works!
- Individualize the pace

[www.cdc.gov/physicalactivity/everyone/guidelines/adults.html](http://www.cdc.gov/physicalactivity/everyone/guidelines/adults.html)

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### Nutrition for Cancer Survivors

- Maintain healthy weight
- Minimum of 5 servings fruit + veg. / day
- Whole grains (avoid refined foods)
- Lean protein
- Low-fat dairy
- Variety of foods
- Limit alcohol consumption
- Food is best source of vitamins and minerals

NCCN.com

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### Nutritional Supplements?

- Vitamin D
  - Primary source is sunshine
  - Recommended daily intake 600-800 i.u./day\*
- Calcium
  - Encourage dietary sources
- Soy? – dietary sources
- Green tea?
- Others?

[www.cancer.org/Treatment/SurvivorshipDuringandAfterTreatment/Nutrition](http://www.cancer.org/Treatment/SurvivorshipDuringandAfterTreatment/Nutrition)

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### Treatment Summary & Survivorship Care Plan

- Healthcare provider contact information
- Basic disease characteristics
- Basic treatment summary
- Need for ongoing treatment
- Schedule of visits, cancer surveillance, other tests
  - Who is responsible
  - When/How often
- Possible late- and long-term effects
- Lifestyle and psychosocial issues

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## Needs, Barriers, and Possible Solutions



<http://www.cdc.gov/cancer/survivorship/reports.htm>

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## Other Helpful References

CHILDREN'S ONCOLOGY GROUP

The world's childhood cancer experts



ASCO | GUIDELINES

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## Other Helpful References

- National Coalition on Cancer Survivorship <http://www.canceradvocacy.org/>
- Cancer Related Fatigue: The Approach and Treatment <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2763160/>
- Surveillance of demographic characteristics and health behaviors among adult cancer survivors <http://www.ncbi.nlm.nih.gov/pubmed/22258477>
- Nutrition for Cancer Survivors-National Comprehensive Cancer Network <http://nccn.com/component/content/article/66-physical/129-nutrition-for-cancer-survivors.html>
- Nutritional Supplements-American Cancer Society [www.cancer.org/Treatment/SurvivorshipDuringandAfterTreatment/Nutrition](http://www.cancer.org/Treatment/SurvivorshipDuringandAfterTreatment/Nutrition)
- Exercise Recommendations-Centers for Disease Control and Prevention [www.cdc.gov/physicalactivity/everyone/guidelines/adults.htm](http://www.cdc.gov/physicalactivity/everyone/guidelines/adults.htm)
- The Johns Hopkins Breast Cancer Survivorship Program [http://www.hopkinsmedicine.org/breast\\_cancer\\_survivor\\_care](http://www.hopkinsmedicine.org/breast_cancer_survivor_care)

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Thank You!



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