



Evidence Based Cancer Survivorship Care

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Disclosure

- No conflict of interest, commercial support or sponsorship



Outline and Objectives

- Overview of cancer survivorship from a public and individual perspective
- Describe cancer survivorship care
- Discuss long term and late effects that commonly occur after cancer treatment
- Use evidence based guidelines (NCCN, ONS PEP, ASCO, ACS) for management strategies



Cancer Survivor

A cancer survivor is a person with cancer of any type who is still living.

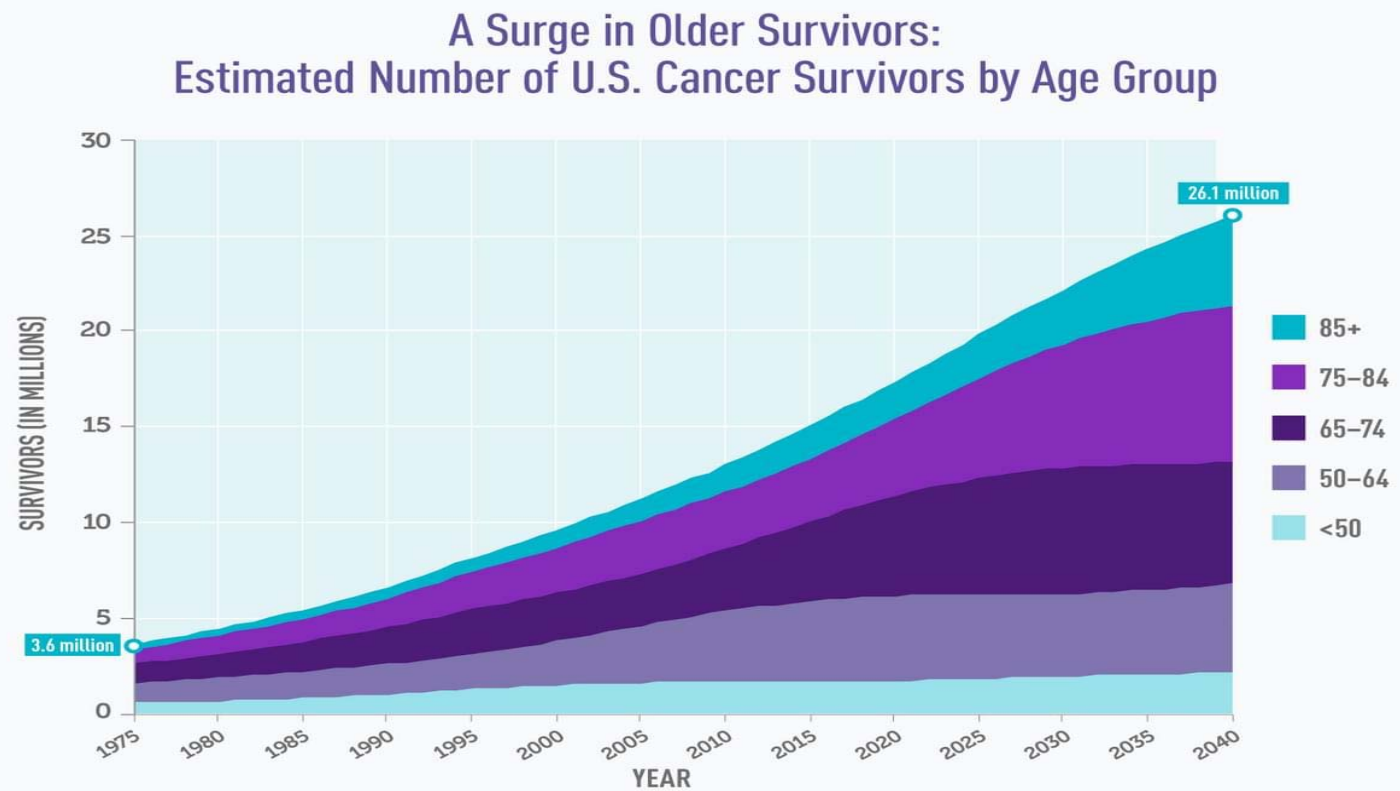
A cancer survivor is anyone who is living with cancer, from the date of diagnosis.

National Cancer Institute
at the National Institutes of Health

In cancer, a person is considered to be a survivor from the time of diagnosis until the end of life.







In US, One in Twenty are Cancer Survivors



Source: Bluethmann SM et al. Cancer Epidemiol Biomarkers Prev. 2016 Jul;25(7):1029-36.
cancer.gov

Most Common Cancers – Prostate, Breast, Lung, Colorectal

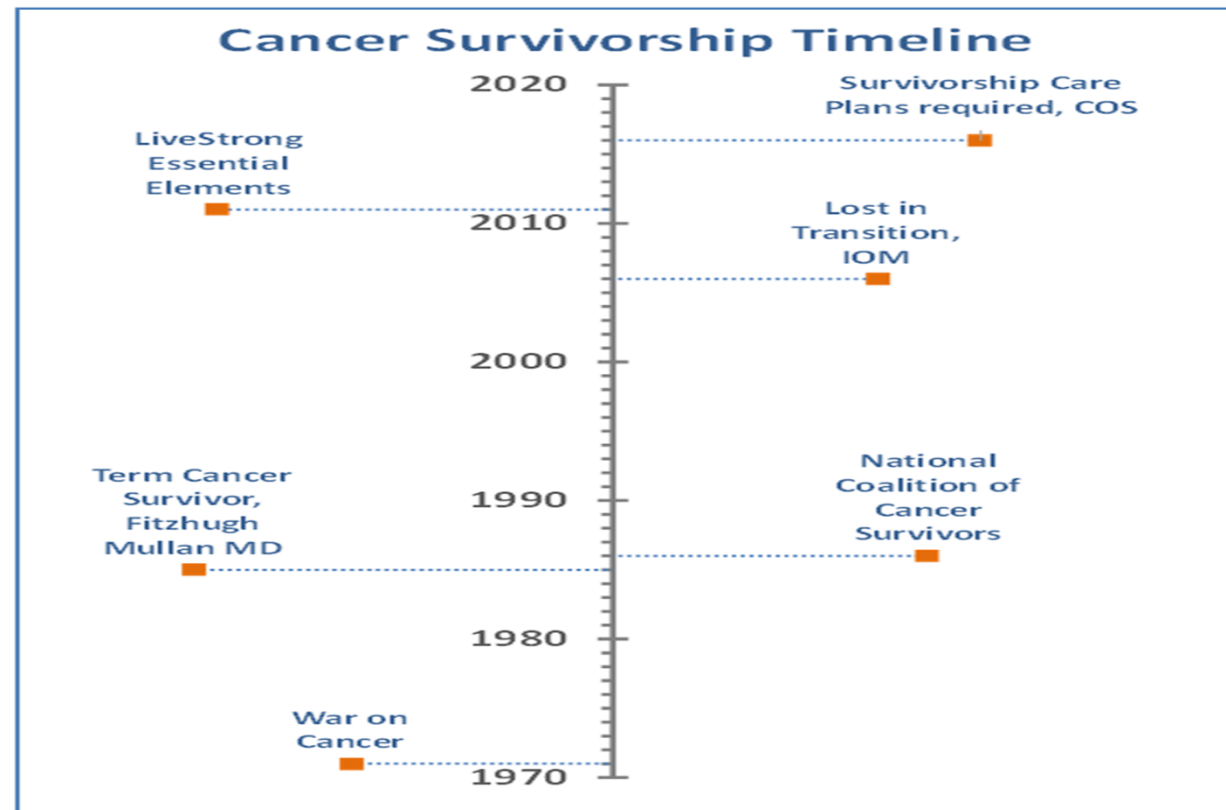
Figure 3. Leading Sites of New Cancer Cases and Deaths – 2017 Estimates

	Male				Female		
Estimated New Cases	Prostate	161,360	19%	 	Breast	252,710	30%
	Lung & bronchus	116,990	14%		Lung & bronchus	105,510	12%
	Colon & rectum	71,420	9%		Colon & rectum	64,010	8%
	Urinary bladder	60,490	7%		Uterine corpus	61,380	7%
	Melanoma of the skin	52,170	6%		Thyroid	42,470	5%
	Kidney & renal pelvis	40,610	5%		Melanoma of the skin	34,940	4%
	Non-Hodgkin lymphoma	40,080	5%		Non-Hodgkin lymphoma	32,160	4%
	Leukemia	36,290	4%		Leukemia	25,840	3%
	Oral cavity & pharynx	35,720	4%		Pancreas	25,700	3%
	Liver & intrahepatic bile duct	29,200	3%		Kidney & renal pelvis	23,380	3%
	All sites	836,150	100%		All sites	852,630	100%
Estimated Deaths				 			
	Lung & bronchus	84,590	27%		Lung & bronchus	71,280	25%
	Colon & rectum	27,150	9%		Breast	40,610	14%
	Prostate	26,730	8%		Colon & rectum	23,110	8%
	Pancreas	22,300	7%		Pancreas	20,790	7%
	Liver & intrahepatic bile duct	19,610	6%		Ovary	14,080	5%
	Leukemia	14,300	4%		Uterine corpus	10,920	4%
	Esophagus	12,720	4%		Leukemia	10,200	4%
	Urinary bladder	12,240	4%		Liver & intrahepatic bile duct	9,310	3%
	Non-Hodgkin lymphoma	11,450	4%		Non-Hodgkin lymphoma	8,690	3%
	Brain & other nervous system	9,620	3%		Brain & other nervous system	7,080	3%
	All sites	318,420	100%		All sites	282,500	100%

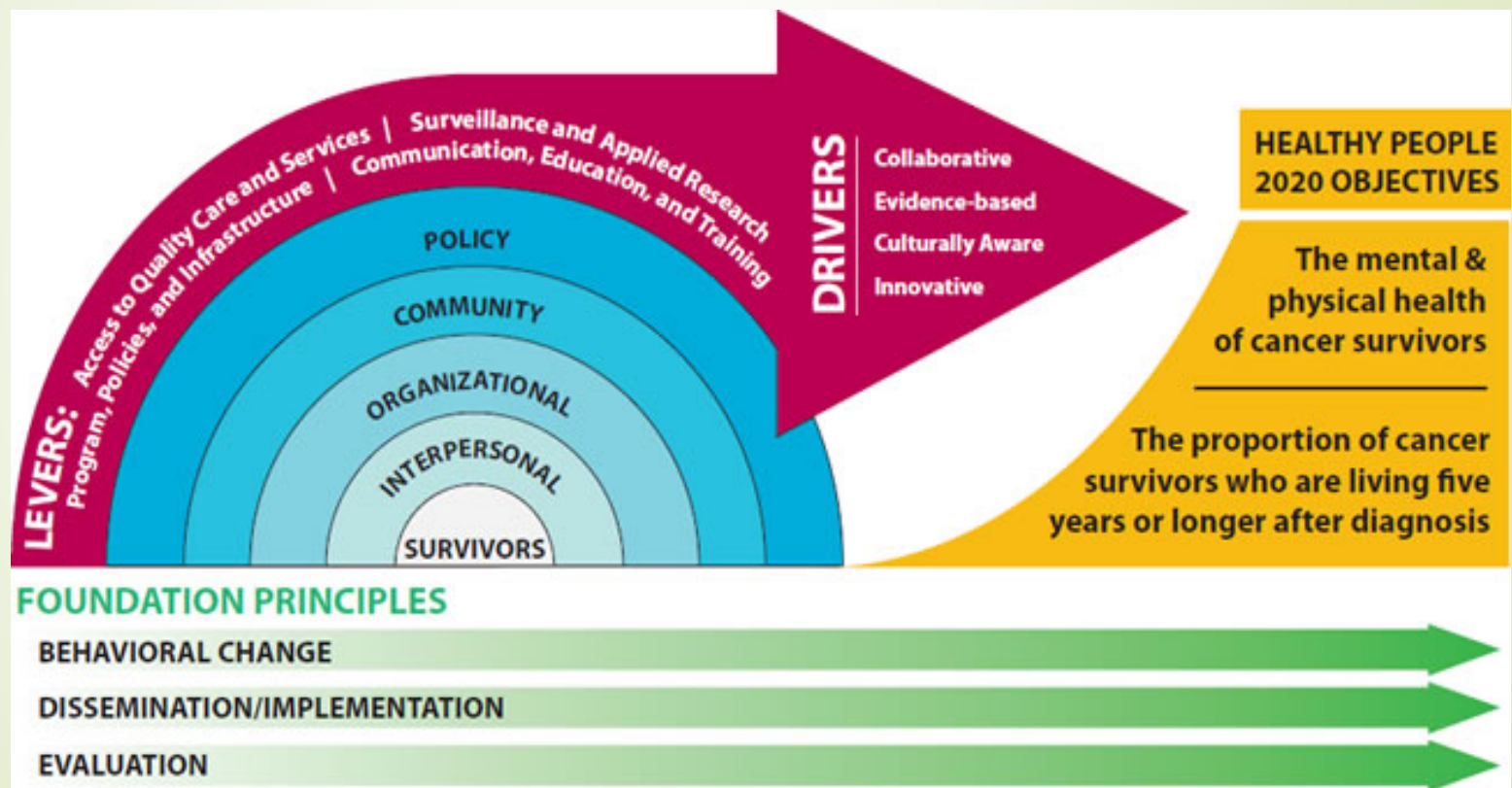
Estimates are rounded to the nearest 10, and cases exclude basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder.

©2017, American Cancer Society, Inc., Surveillance Research

History

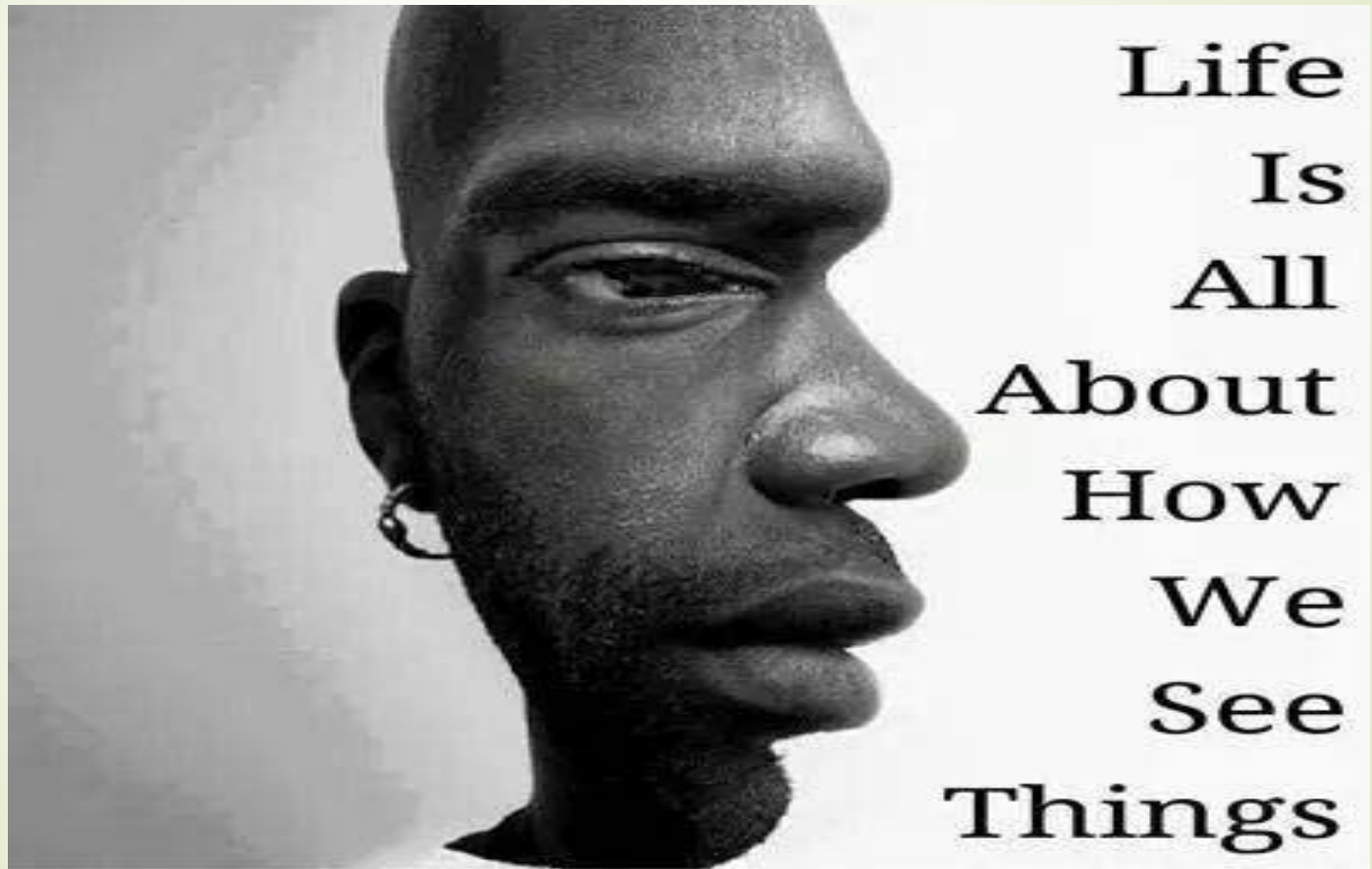


Cancer Survivorship as a Public Health Issue



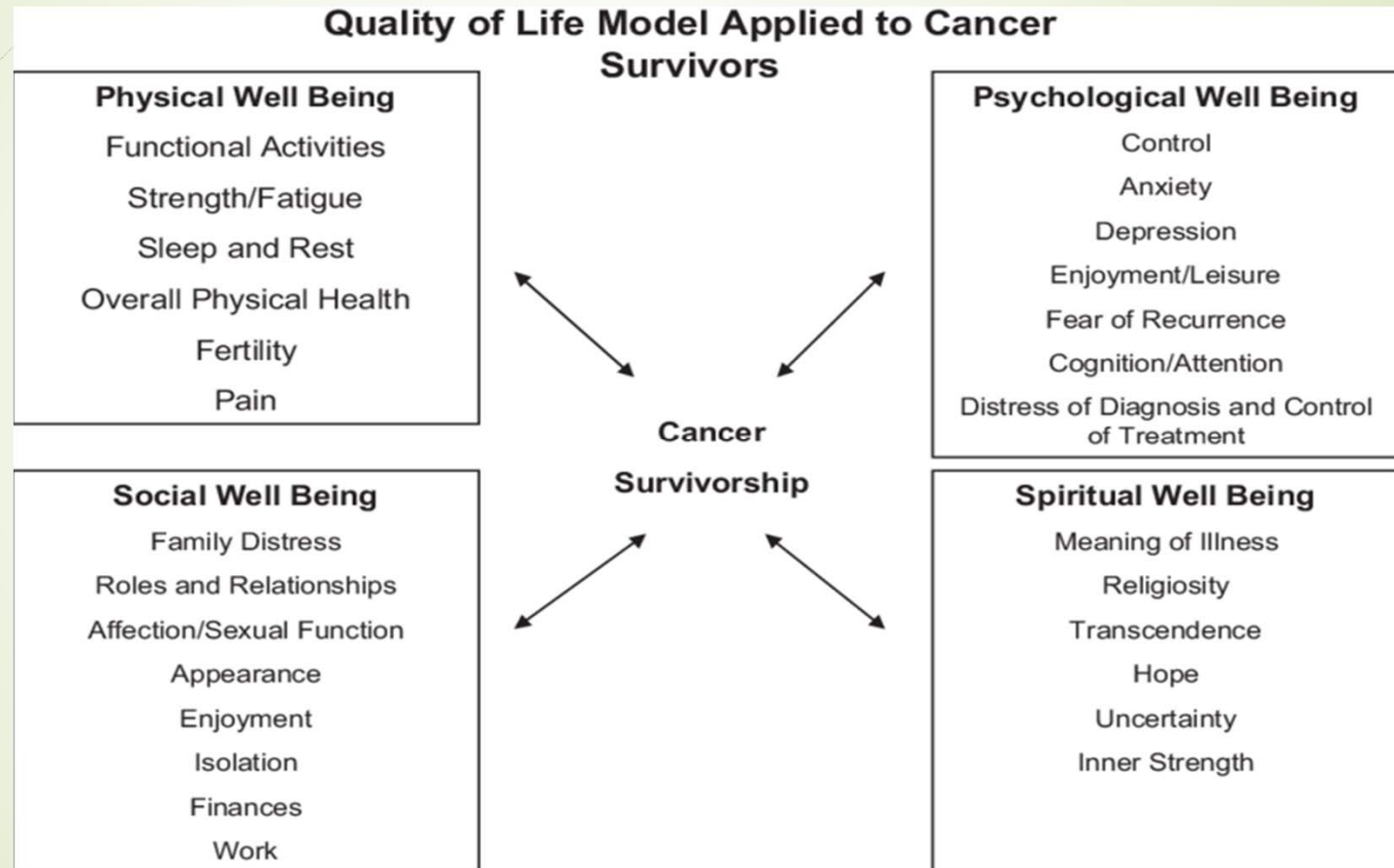
<https://www.cdc.gov/cancer/dcpc/research/articles/survivorship-supplement.htm>

Perspective



Life
Is
All
About
How
We
See
Things

Quality of Life



Ferrell, B.R., & Hassey Dow, K. (1997). Quality of life among long-term cancer survivors. *Oncology*, 11(4), 565-571.



Cancer Survivorship Care *goals*

- Preventing secondary cancers and recurrence of cancer whenever possible.
- Promoting appropriate management following diagnosis and/or treatment to ensure the maximum number of years of healthy life for cancer survivors.
- Minimizing preventable pain, disability, and psychosocial distress for those living with, through, and beyond cancer.
- Supporting cancer survivors in accessing the resources and the family, peer, and community support they need to cope with their disease.

<https://www.cdc.gov/cancer/survivorship/pdf/plan.pdf>. Retrieved 9.2018

Living Well With and Beyond Cancer

AYA- work, finish school, live independently, establish long term relationships

Seniors- co-morbid issues, energy for leisure activities, live independently



https://www.nccn.org/professionals/physician_gls/pdf/aya.pdf,
https://www.nccn.org/professionals/physician_gls/pdf/senior.pdf. Retrieved 5.10.19





Fertility Preservation

- Initiate the conversation about the possibility of infertility with patients as early as possible
- Be prepared to discuss fertility preservation options
- Sperm, oocyte, and embryo cryopreservation are considered standard practice and are widely available
- Refer all patients to appropriate reproductive specialists
- The discussion should be documented

Young adult survivor interviewed in documentary *Cancer Rebellion*: preserving fertility is our second greatest concern. Surviving cancer is first. Fertility preservation should be standard before starting therapy.

Stress of Living with Uncertainty



<https://www.behance.net/gallery/34794861/The-Things-They-Carried>. Retrieved 5.8.19

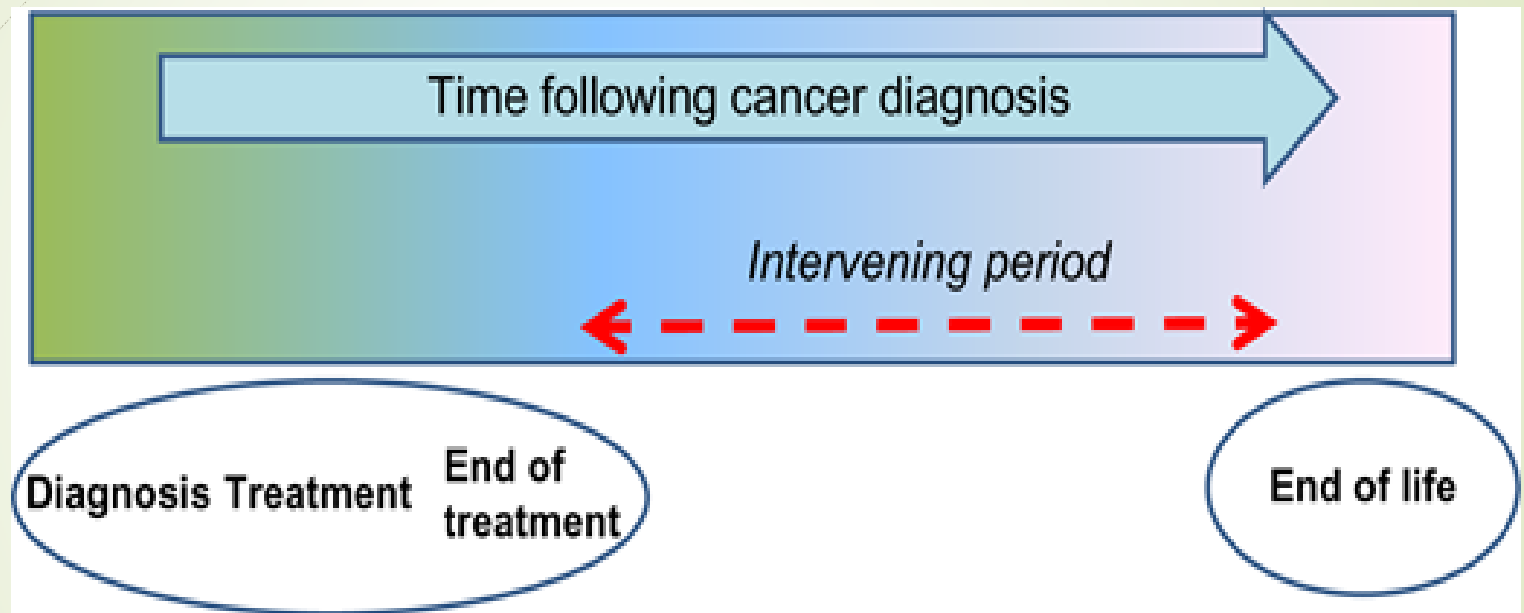
Stress of Living with Uncertainty Management



- Assess distress during times of transition: diagnosis, end of treatment, recurrence, survivorship, end of life care
- Assess fear of recurrence: surveillance
- Manage
 - Listen
 - Health behaviors, routine
 - Community organizations: disease specific
 - Psychosocial: Social work, psych. specialists

https://www.nccn.org/professionals/physician_gls/pdf/distress.pdf. retrieved 5.10.2019

Cancer Survivorship Care



<https://academic.oup.com/jjco/article/46/7/599/2218890>

Cancer Survivorship Care *provides*

- Prevention and screening for cancer
- Screening of long term and late effects
- Intervention for consequences of cancer and treatment
- Education and counseling for survivor and family
 - Symptom management
 - Healthy living
- Summarized in a personalized plan of coordinated care

https://www.nccn.org/professionals/physician_gls/pdf/survivorship.pdf. Retrieved 5.10.19

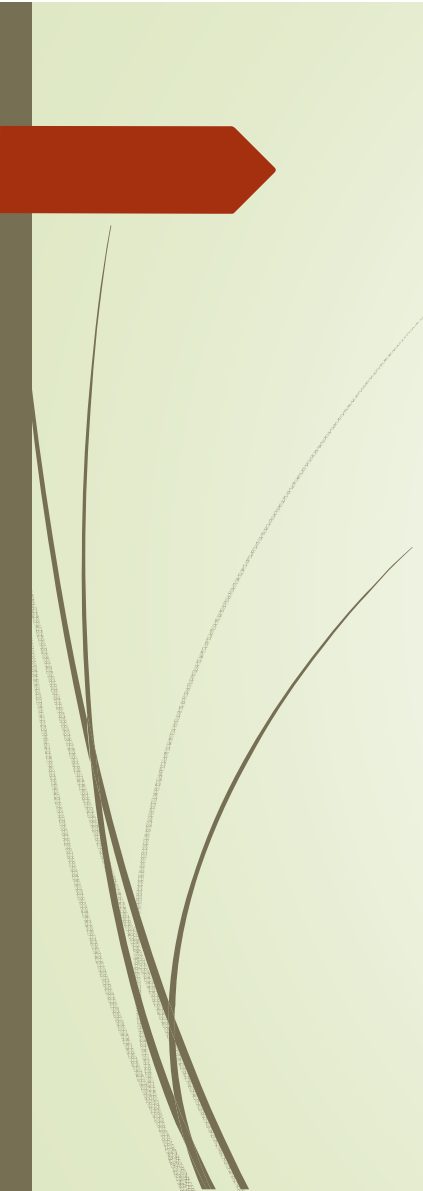




Long Term and Late Effects

- Long term effects are medical problems that develop during treatment and persist after treatment completion
- Late effects are medical problems that develop or become apparent months or years after treatment.

<https://smhs.gwu.edu/gwci/survivorship/ncsrc/elearning>. Retrieved 9.2018 Also reference for slide 20



Treatment	Long term effects- <i>potential</i>	Late effects- <i>potential</i>
Chemotherapy	Fatigue	Vision/cataracts
	Premature menopause	Infertility
	Sexual dysfunction	Liver problems
	Neuropathy	Lung disease
	Cognitive changes	Reduced lung capacity
	Kidney failure	Osteoporosis
		Second cancers
Radiation Therapy	Fatigue	Cataracts
	Skin sensitivity	Cavities and tooth decay
	Lymphedema	Cardiovascular disease
		Hypothyroidism
		Infertility
		Lung disease
		Intestinal problems
		Second cancers
Surgery	Sexual dysfunction	Body image changes
	Incontinence	Functional disability
	Pain	Infertility



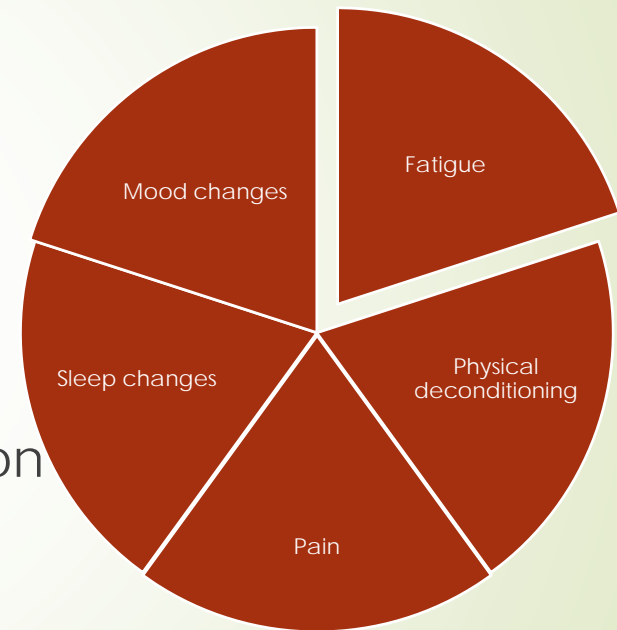
Immunotherapy- CAR T

- Long term effects
 - Cytopenias and Infection: Most frequent is B cell aplasia including hypogammaglobulinemia. Monitor at least 90 days. Give growth factors, transfusions, immunoglobulin infusions and antimicrobial prophylaxis.
 - Fatigue: Duration 4-6 weeks. Supportive care.
 - Fertility: No human clinical studies. Conditioning chemotherapy may affect. Have the conversation. Refer to fertility specialist.
 - Financial toxicity: 50% report financial burden, 16% report acute distress about financial costs
- Late effects
 - Second malignancies: FDA mandate to follow post CAR T patients 15 years

CJON 2019, 23(2), 42-48 DOI: 10.1188/19.CJON.S1.42-48
Guidelines for management of acute effects: of immunotherapy:
https://www.nccn.org/professionals/physician_gls/pdf/immunotherapy.pdf

Common Long Term Issues- *cluster*

- Physical deconditioning
- Fatigue
- Sleep changes
- Pain- CIPN
- Distress, anxiety and depression
- Cognitive changes
- Sexual dysfunction



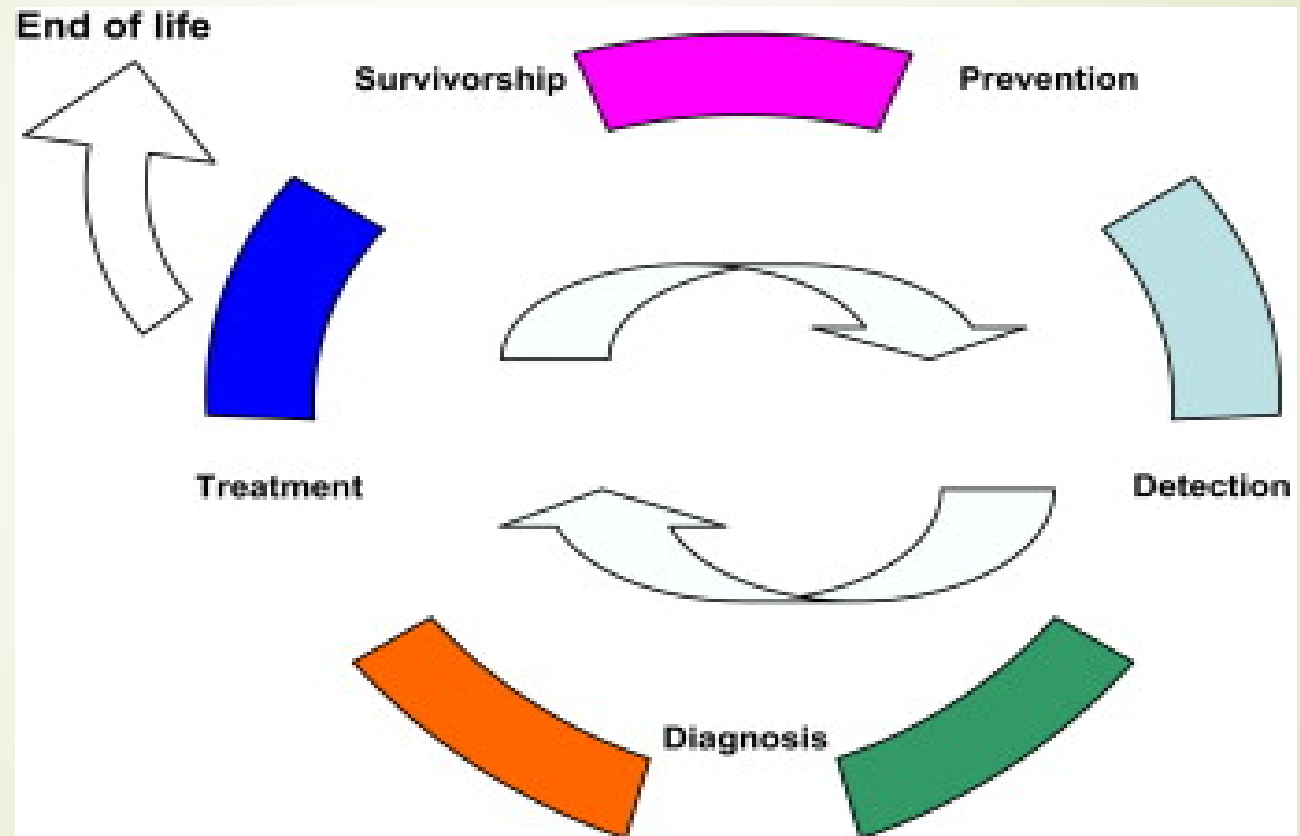
Medications- Required?



Case Studies



Cancer Control Continuum



Rowland, JH Hematology Oncology Clin N Am 22 (2008) 181-200

CANCER SCREENING

Cancer Type	American Cancer Society (published 5.2018)	US Preventive Service Task Force/Center for Disease Control (retrieved 5.9.2019)
Colorectal	Age 45 -75 Colonoscopy every 10 years or similar test. Age 75 Consider stopping testing Age 85 Stop testing	Age 45-49 high risk groups Age 50 -75 Colonoscopy every 10 years or similar test.
Lung	Age 55 to 74 current smoker or have quit within the past 15 years and 30 pack year history of tobacco smoking, consider a low dose CT scan	Age 55 to 80 current smoker or have quit within the past 15 years and 30 pack year history of tobacco smoking, consider a low dose CT scan
Breast	Women Age 40 to 44 choose annual mammograms Age 45-54 annual mammogram Age \geq 55 mammograms every 1-2 years. Continue as long as expected to live \geq 10 Know how breasts normally look and feel and report any breast changes to HCP	Age 40 to 49 talk with HCP Age 50 to 74 mammogram every two years. Clinical breast exam or doing breast self-exam has not been found to lower the risk of dying from breast cancer.
Cervical	Women Age 21-29 PAP test every 3 years Age 30-65 HPV and PAP test every 5 years, or PAP test every 3 years	Age 21-29 PAP test every 3 years Age 30-65 HPV and PAP test every 5 years, or PAP test every 3 years
Prostate	Men Age 45-49 and African American or have a father or brother who had prostate cancer before age 65, talk with HCP about testing Age \geq 50 talk to HCP about the pros and cons of testing. If tested, get a PSA blood test with or without a rectal exam. Testing frequency depends on PSA level.	Age 55-69 talk to HCP about the pros and cons of testing Age \geq 70 stop testing
Testicular	Not recommended	Not recommended

Guidelines for Healthy Living

Life's Simple 7's

	Manage Blood Pressure	Control Cholesterol	Reduce Blood Sugar	Get Active	Eat Better	Lose Weight	Stop Smoking
JNC 8, 2014 ⁹	X						
ACC/AHA Cholesterol Guidelines, 2013 ⁸		X					
NCCN Guidelines Smoking Cessation, 2015 ¹⁰							X
US Dietary Guidelines Adv Committee, 2015 ¹¹					X	X	
ACC/AHA Lifestyle Mngmt Guidelines, 2013 ¹²	X	X	X	X	X	X	
American Diabetes Association, 2016 ¹³			X	X	X	X	
Physical Activity Guidelines, 2008 ¹⁴				X			
NCCN Survivorship, 2015 ⁷				X	X	X	X
ACS/ASCO Breast Cancer Survivors ⁵		X		X	X	X	X
ACS/ASCO Prostate Cancer Survivors ⁶				X	X	X	X

JNC, Joint National Committee; ACC, American College of Cardiology; AHA, American Heart Association; NCCN, National Comprehensive Cancer Network; US, United States; Adv, advisory; Mngmt, management; ACS, American Cancer Society; ASCO, American Society of Clinical Oncology



Vaccinations- Two Rules

- Will it do harm?

- Avoid all vaccines with live attenuated viruses 4 weeks before treatment, during treatment, and at least 3 months after treatment
- Special considerations
 - Wait 6 months after anti-B cell therapy
 - BMT patients often have institution specific schedules

- Will it protect?

- Give all inactivated vaccines like pneumococcus, DPT, hepatitis B.
- Give two weeks before treatment or four to six months after treatment, except inactivated flu vaccine.

Figure 2. Recommended immunization schedule for adults aged 19 years or older by medical condition and other indications, United States, 2018

This figure should be reviewed with the accompanying footnotes. This figure and the footnotes describe indications for which vaccines, if not previously administered, should be administered unless noted otherwise.

Vaccine	Pregnancy ^{1,4}	Immuno-compromised (excluding HIV infection) ^{3,7,11}	HIV infection CD4+ count (cells/ μ L) ^{3,7,9-10}		Asplenia, complement deficiencies ^{7,10,11}	End-stage renal disease, on hemodialysis ^{7,9}	Heart or lung disease, alcoholism ⁷	Chronic liver disease ^{7,9}	Diabetes ^{7,9}	Health care personnel ^{12,13}	Men who have sex with men ^{6,8,9}
			<200	\geq 200							
Influenza ¹											
1 dose annually											
Tdap ² or Td ²	1 dose Tdap each pregnancy										
1 dose Tdap, then Td booster every 10 yrs											
MMR ³		contraindicated									
1 or 2 doses depending on indication											
VAR ⁴		contraindicated									
2 doses											
RZV ⁵ (preferred)											
2 doses RZV at age \geq 50 yrs (preferred)											
or											
ZVL ⁵		contraindicated									
1 dose ZVL at age \geq 60 yrs											
HPV-Female ⁶											
3 doses through age 26 yrs											
2 or 3 doses through age 26 yrs											
HPV-Male ⁶											
3 doses through age 26 yrs											
2 or 3 doses through age 21 yrs											
2 or 3 doses through age 26 yrs											
PCV13 ⁷											
1 dose											
PPSV23 ⁷											
1, 2, or 3 doses depending on indication											
HepA ⁸											
2 or 3 doses depending on vaccine											
HepB ⁹											
3 doses											
MenACWY ¹⁰											
1 or 2 doses depending on indication, then booster every 5 yrs if risk remains											
MenB ¹⁰											
2 or 3 doses depending on vaccine											
Hib ¹¹											
3 doses HSCT recipients only											
1 dose											



Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection



Recommended for adults with other indications



Contraindicated



No recommendation



Health Behavior Recommendations

- Weight control with normal BMI
- Diet high in vegetables, fruits and whole grains, low in processed and red meat
- Limit alcohol to 1 drink daily in females and 2 drinks daily in males
- Moderate physical exercise, at least 150 minutes weekly with strength training at least twice weekly
- Avoid prolonged periods of sitting
- Avoid tobacco
- Routine sun protection with clothing and sunscreen; avoidance of sun & tanning beds
- Annual influenza and other vaccinations
- Health Maintenance
 - Regular check of BP, blood lipids and glucose
 - Regular vision exam
 - Every 6 months dental cleaning *immunosuppression considerations*

https://www.nccn.org/professionals/physician_gls/pdf/survivorship.pdf. Retrieved 5.10.2019



Summary



- Cancer survivorship is a public health issue that affects us all
- Increasing numbers of people living longer but not necessarily better
- Most long term and late effects can not be cured. Symptoms can be managed
- Basic health promotion strategies can improve quality of life
- Research is required to better understand the long term implications of many treatments including immunotherapy and provide stronger evidence based guidelines
- In the meantime, the best guidelines for survivorship care (to date) are based on clinical data and decided by consensus
- For individual care, need to know name of cancer, date of diagnosis, age at diagnosis, treatment and date of treatment end.

Discussion



Cancer Survivors' Advice





References

Cancer Screening

- American Cancer Society Cancer Screening Guidelines
<https://www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer.html>. Retrieved May 9, 2019.
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https://www.cdc.gov/cancer/cervical/basic_info/screening.html. Retrieved May 9, 2019.
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Retrieved May 9, 2019.