


Heart Health After Cancer Treatment


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Disclosure

I have No financial disclosure or conflicts of interest with the presented material in this presentation

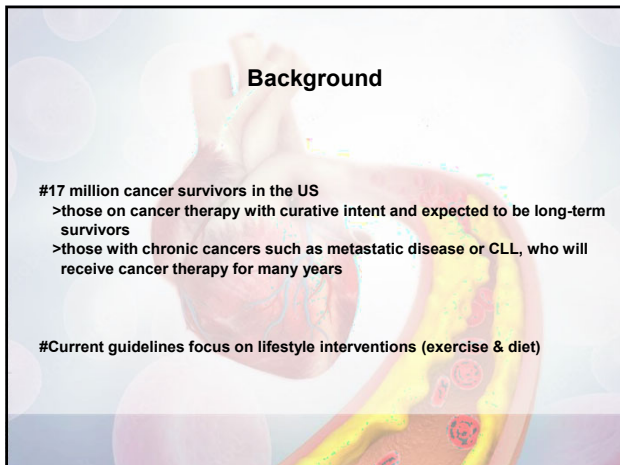


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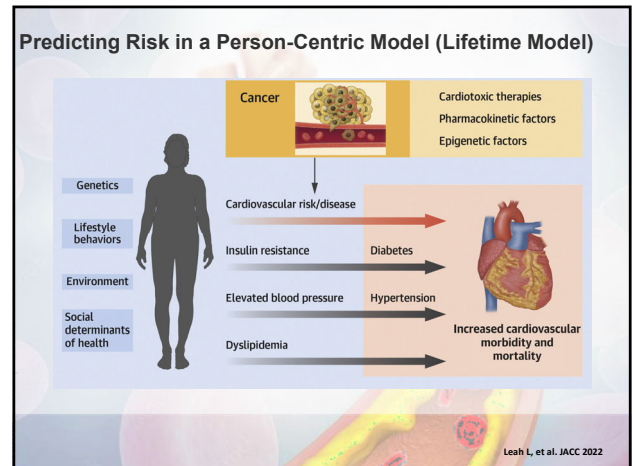
Background

#17 million cancer survivors in the US
 >those on cancer therapy with curative intent and expected to be long-term survivors
 >those with chronic cancers such as metastatic disease or CLL, who will receive cancer therapy for many years

#Current guidelines focus on lifestyle interventions (exercise & diet)



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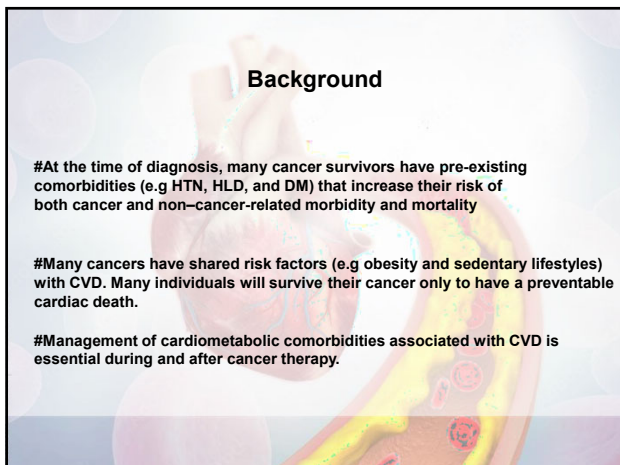
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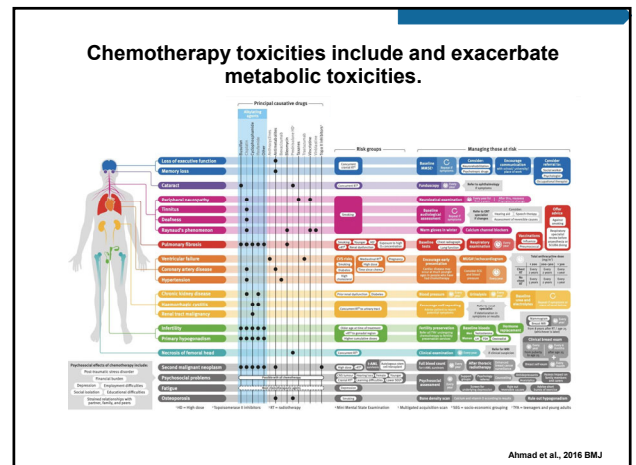
#At the time of diagnosis, many cancer survivors have pre-existing comorbidities (e.g HTN, HLD, and DM) that increase their risk of both cancer and non-cancer-related morbidity and mortality

#Many cancers have shared risk factors (e.g obesity and sedentary lifestyles) with CVD. Many individuals will survive their cancer only to have a preventable cardiac death.

#Management of cardiometabolic comorbidities associated with CVD is essential during and after cancer therapy.



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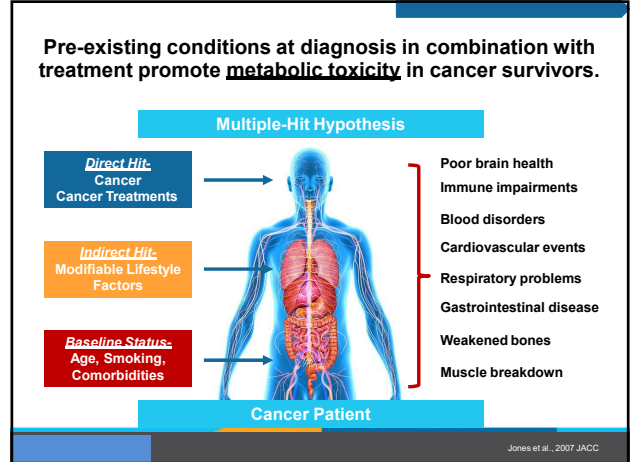
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TABLE 1 Drug Class and Management Considerations for Anticancer Therapy Associated With Hypertension

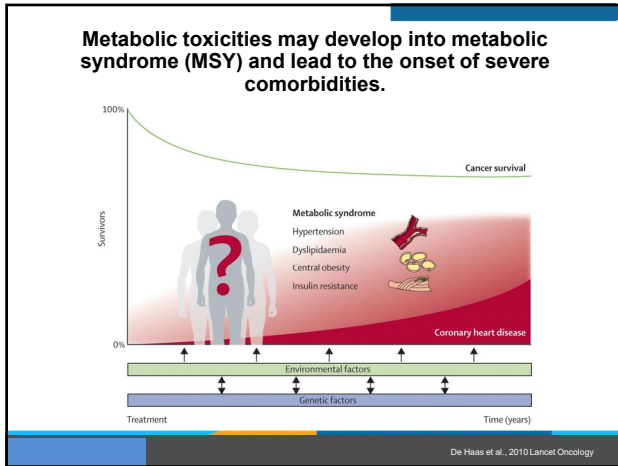
Drug Class	Common Therapy	Frequency of Hypertension	Organ Systems/Targeted	Management Strategies	Notes and Considerations
Alkylating agents	Cisplatin ^{1,2}	Very common	Bladder, breast, esophagus, head and neck, lung, testicular		
Antandrogens	Bicalutamide ³ Flutamide ³ Nilutamide ³	Common Uncommon Uncommon	Prostate	Spiroindolones for abiraterone No specific first-line recommendation for lupron and degarelix	Spiroindolones may decrease the therapeutic effect of abiraterone
Aromatase inhibitors	Anastrozole ⁴ Exemestane ⁴ Letrozole ⁴	Very common Common Common	Breast		80% hepatic elimination via N-glucuronides, hydroxylation, glucuronidation
BRM inhibitors	Venetoclax ⁵ Tosiprevostat ⁶	Very common Very common	Melanoma Leukemia, lymphoma		
MEK inhibitors	Tametinib ⁷	Very common	Melanoma		
Mitoxantrone analogs	Romidepsin ⁸ Rituximab ⁹ Ofatumumab ¹⁰ Alemtuzumab ¹¹	Very common Common Uncommon Rare	Colorectal, gastric, lung Leukemia, lymphoma Leukemia, lymphoma Leukemia, lymphoma		
mTOR inhibitors	Everolimus ¹² Temsirolimus ¹³	Very common Common	Breast, pancreas, renal Renal	Dihydropyridine CCBs ACE inhibitor	Temsirolimus may enhance adverse/ toxic effects of ACE inhibitor
Proteasome inhibitors	Bortezomib ¹⁴ Carfilzomib ¹⁵	Common Very common	Multiple myeloma, lymphoma Multiple myeloma	No specific considerations among first-line agents	PAISO 3A4 inducers and inhibitors may alter serum concentrations of bortezomib
Thyrosine kinase inhibitors	Axitinib ¹⁶ Cabozantinib ¹⁷ Rucaparib ¹⁸ Pazopanib ¹⁹ Regorafenib ²⁰ Sorafenib ²¹ Sunitinib ²²	Very common Very common Very common Very common Very common Very common Very common	Renal, thyroid Leukemia/lymphoma Leukemia Leukemia, sarcoma, thyroid Colorectal, GIST, HCC HCC, renal, thyroid GIST, renal, sarcoma, thyroid	Metformin shown to be effective first-line agent in a clinical trial Anti-angiogenic ACE inhibitors/ARBs Dihydropyridine CCBs	ACE inhibitors may enhance adverse/ toxic effects of ACE inhibitor Nifedipine/verapamil may be effective against risk of proteinuria, though data are limited
VEGF inhibitors	Vandetanib ²³ Bevacizumab ²⁴ Ziv-aflibercept ²⁵	Very common Very common Very common	Thyroid Breast, cervical, colorectal, endometrial, glioblastoma, ovarian, renal, sarcoma, colorectal	ACE inhibitors/ARBs Dihydropyridine CCBs Beta-blocker Thiazide diuretic	Renal clearance Beta-blocker may have beneficial effect in interaction with individual HCV patients Thiazide diuretic ACE inhibitor may be effective against risk of proteinuria, though data are limited

Leah L, et al. JACC 2022

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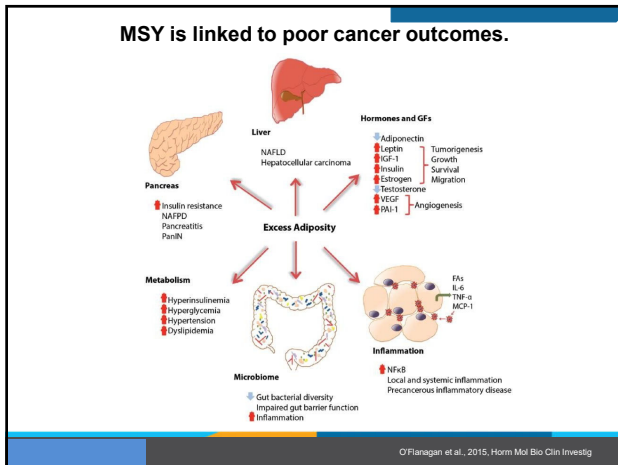
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Metabolic syndrome (MSY) is associated with a 2-fold increase in CVD and Type 2 Diabetes.

- Blood Pressure** ≥ 130/85 or medication
- HDL** < 40 mg/dL (men) < 50 mg/dL (women)
- Waist Circumference** > 40 in (men) > 35 in (women)
- Glucose** ≥ 100 mg/dL or medication
- Triglycerides** ≥ 150 mg/dL or medication

AHA/NHLBI

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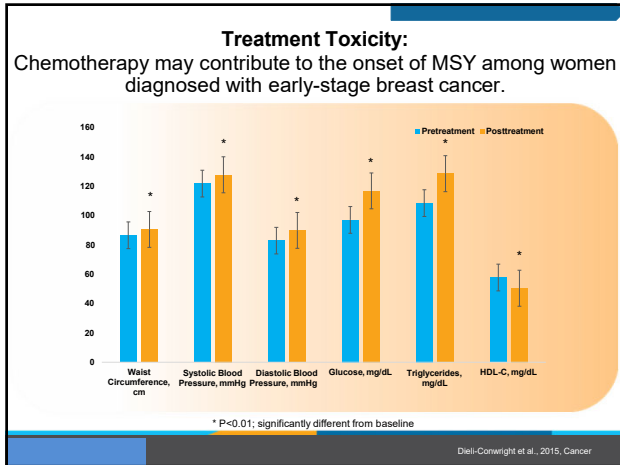
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Treatment Toxicity: Chemotherapy may contribute to the onset of MSY among women diagnosed with early-stage breast cancer.

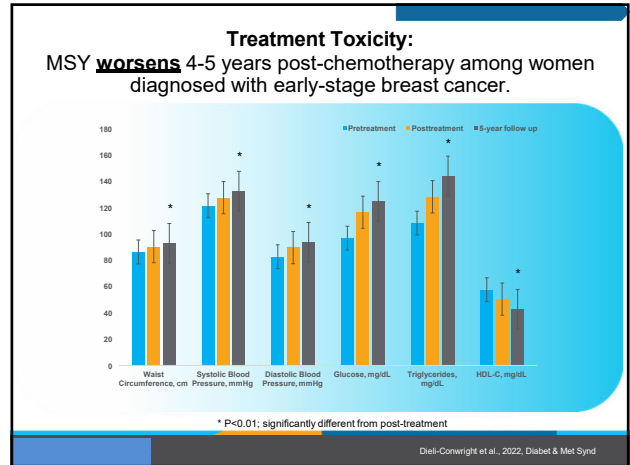
CHARACTERISTIC	MEAN (Standard Deviation)	N (%)	
Age, years	48.2(10.1)	30(40)	
Menopausal status		48(53)	
		Premenopausal	40(47)
		Postmenopausal	
Race/ethnicity		38(44)	
		Caucasian	8(21)
		Asian	28(52)
		Hispanic	7(25)
		African-American	9(11)
		Other	
Tobacco use		44(49)	
		Never	4(21)
		Current	4(21)
		Past	40(45)
Partner status		68(72)	
		Married	11(15)
		Single	5(8)
Education level		20(28)	
		High school or equivalent	47(58)
		College or postgraduate degree	
Employment status		57(68)	
		Full-time	18(18)
		Part-time	13(18)
		Retired	
Cancer stage		24(42)	
		I	42(49)
		II	10(11)
Surgery type		30(48)	
		Mastectomy	29(24)
		Lumpectomy	18(21)
Chemotherapy type		36(42)	
		Doxorubicin/Cyclophosphamide + Paclitaxel	31(38)
		Doxorubicin/Cyclophosphamide	8(25)
		Cyclophosphamide	8(21)
		Doxorubicin/Cyclophosphamide	8(21)
		Doxorubicin/Cyclophosphamide/Epidaurin	8(21)

Diels-Cornwright et al., 2015, Cancer

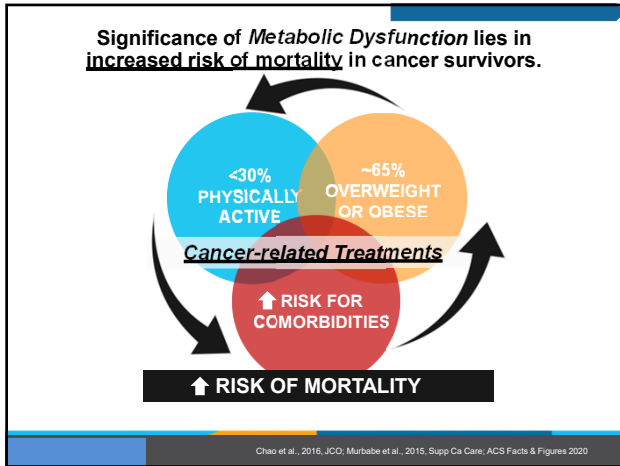
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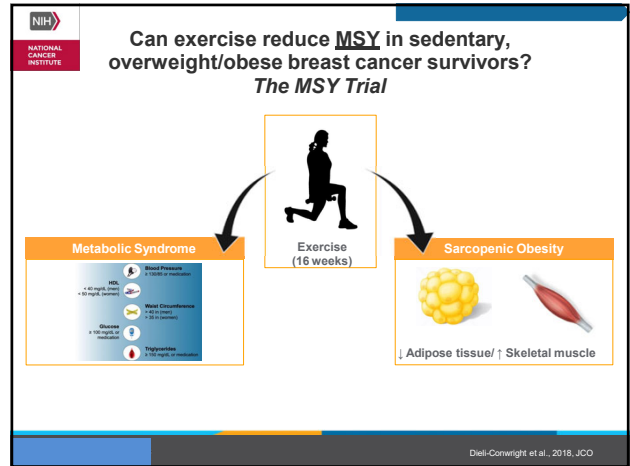
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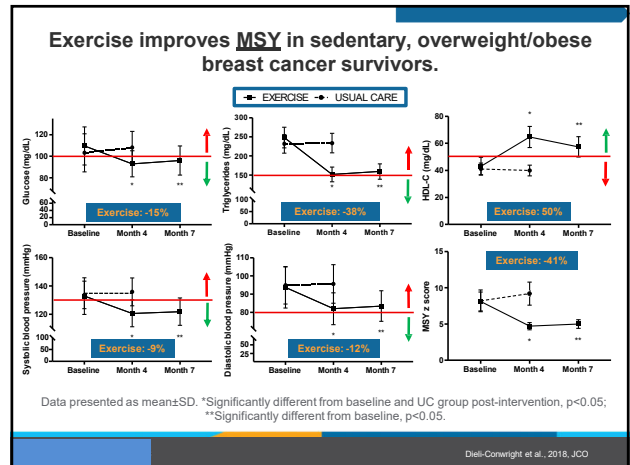
The MSY Exercise Intervention

Supervised, Progressive Aerobic and Resistance Exercise

Day 1		Day 2		Day 3	
Resistance Exercise		No Resistance Exercise		Resistance Exercise	
3 sets	15 repetitions			3 sets	15 repetitions
65-80% 1-rep max				65-80% 1-rep max	
Aerobic Exercise		Aerobic Exercise		Aerobic Exercise	
50 minutes	65-80% VO _{2max}	50 minutes	65-80% VO _{2max}	50 minutes	65-80% VO _{2max}

Dieli-Conwright et al., 2018, JCO

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SCCTSI

Can HIIT improve MSY in sedentary, overweight/obese breast cancer patients receiving anthracycline chemotherapy? The HIIT Trial

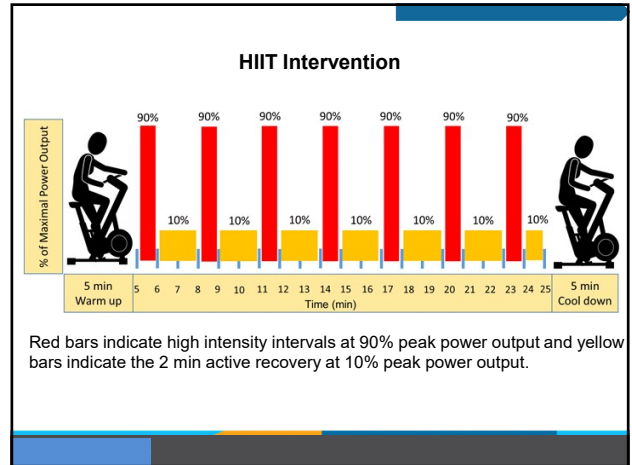
Chemotherapy (Anthracyclines)

MSY

High Intensity Interval Training (HIIT)

Lee et al., 2019, BCRT

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HIIT improves MSY in breast cancer patients undergoing anthracycline-based chemotherapy.

	Baseline	Post Intervention	Between Group Difference	
	Mean (sd)	Mean (sd)	Mean (95% CI)	p
Metabolic Syndrome				
Waist Circumference (cm)			-1.88 (-4.40, 0.63)	0.14
Systolic Blood Pressure (mmHg)			-4.38 (-11.31, 2.56)	0.21
Diastolic Blood Pressure (mmHg)			-2.78 (-7.41, 1.84)	0.22
HDL-C (mg/dL)			27.51 (19.73, 35.30)	<0.001
Triglycerides (mg/dL)			-80.89 (-109.69, -52.09)	<0.001
Glucose (mg/dL)			-37.21 (-48.35, -16.07)	<0.001
Mets Z-Score			-7.60 (-9.08, -6.13)	<0.001
ATP III Score			-2.05 (-2.69, -1.40)	<0.001

Gonzalo-Encabo et al., JHSH

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Does a 12-week periodized resistance training intervention affect health outcomes in prostate cancer survivors on ADT?

- Frequency** • 3x/week
- Intensity** • Progressed through periodization
- Time** • 45 min/session; 3 months
- Type** • Machine-based, total body exercises

Jackie Dawson; Dawson et al. 2018, BMC Cancer

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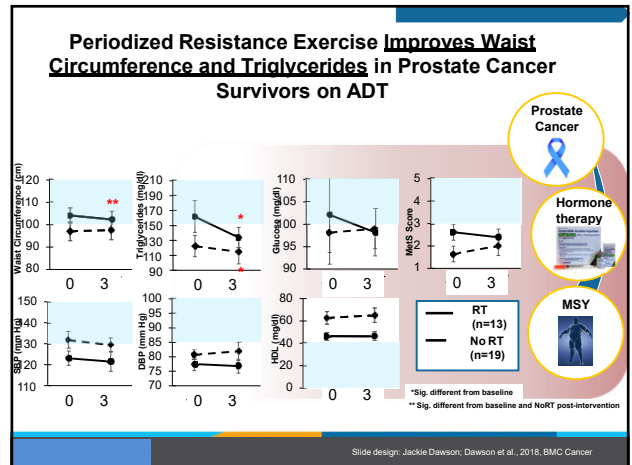
Periodization is a safe, feasible approach to resistance training among prostate cancer survivors.

Mesocycle	Muscular Endurance /Hypertrophy				Hypertrophy							
Microcycle (Wk)	1	2	3	4	5	6	7	8	9	10	11	12
Intensity	60% 1RM	65-67%1RM	70% 1RM	75% 1RM	80% 1RM	83% 1RM	80% 1RM	83% 1RM	80% 1RM	83% 1RM	80% 1RM	83% 1RM
Volume	15 x3	12 x3	10 x3	10 x3	10 x3	10 x3	8 x3	8 x3	8 x3	8 x3	8 x3	8 x3
Rest	1 min	1 min	1 min	1 min	1 min	1 min	1 min	1 min	1 min	1 min	1 min	1 min

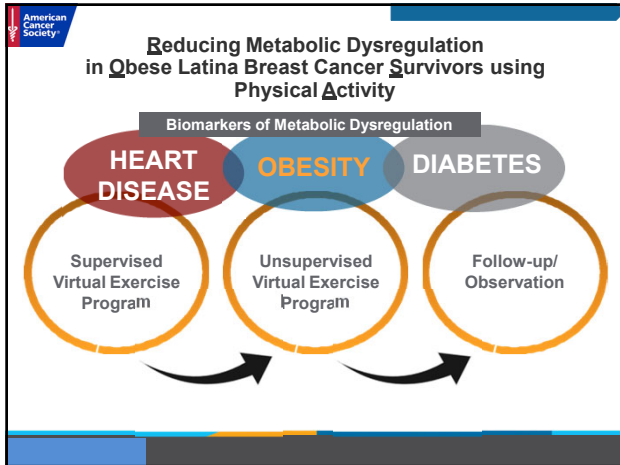
Training split: Lower Body, Upper Body, Lower + Upper Body

Jackie Dawson; Dawson et al. 2018, BMC Cancer

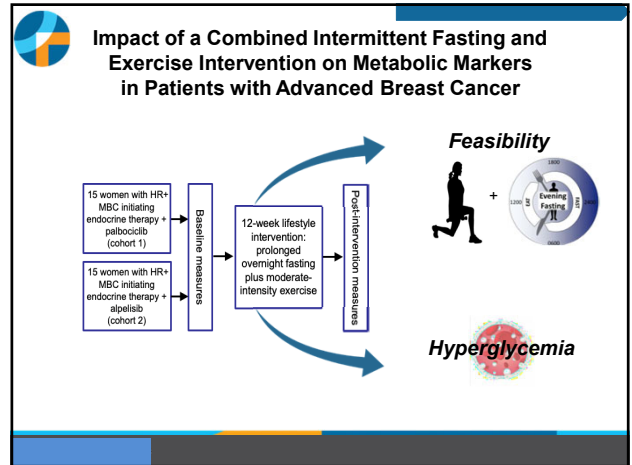
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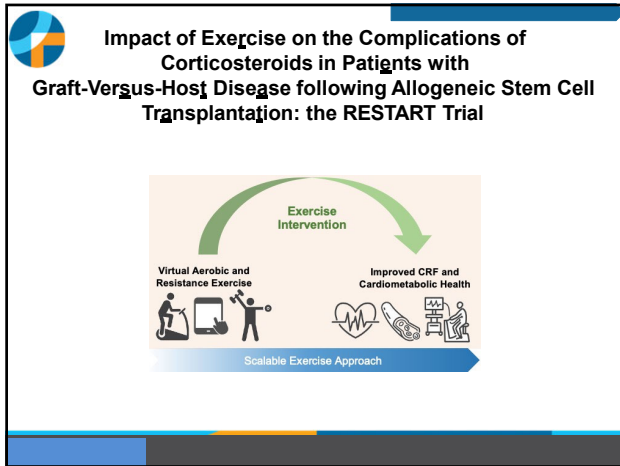
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CANCER TREATMENT & YOUR HEART CardioSmart American College of Cardiology

CANCER TREATMENTS SAVE LIVES but sometimes also can damage your heart or blood vessels.

17 MILLION SURVIVORS in the U.S. alone

HEART CONCERNS

Know what increases your risk for HEART DISEASE: High blood pressure, High cholesterol, Diabetes, Obesity, Tobacco use, Family history

Possible effects during treatment: Damage to the heart or blood vessels, Loss of physical fitness, weight gain, high blood pressure

Late effects: Heart problems can develop later, more than 10 years down the line

WHAT YOU CAN DO

BEFORE AND DURING TREATMENT

- Discuss your heart health
- Understand how cancer therapies might affect your heart
- Ask about:
 - What increases the chance of harm to your heart
 - Tests that could check how your heart or blood vessels are doing
 - How to protect your heart during treatment

AFTER TREATMENT

- Know what cancer treatments you've had, including dose and for how long
- List these along with other risk factors like high cholesterol
- Ask about heart checkups

TELL YOUR HEALTH CARE TEAM IF YOU EXPERIENCE:

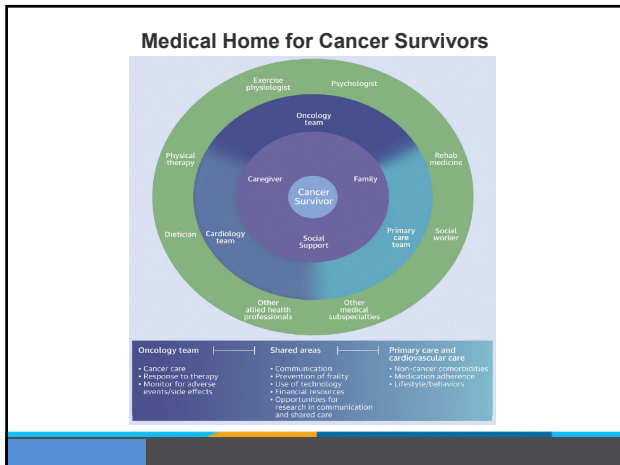
- Shortness of breath
- Fatigue
- Chest pain
- Irregular heartbeat
- Swelling of legs or ankles

THROUGHOUT YOUR JOURNEY

- MANAGE:** blood pressure, cholesterol, diabetes, weight, stress
- STOP SMOKING**
- EXERCISE**
- EAT RIGHT**

Information provided for educational purposes only. Please consult your health care provider about your specific health needs. Go to [CardioSmart.org/CancerTreatment](https://www.cardiosmart.org/CancerTreatment) to learn more.

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Thank you!

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