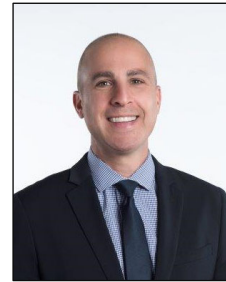




Heart Health During and After a Transplant

Celebrating a Second Chance at Life
Survivorship Symposium

April 17- 23, 2021



Saro Armenian DO, MPH
City of Hope



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Heart Health after Transplant

Saro Armenian, DO, MPH
Norman & Sadie Lee Foundation Professor,
Departments of Pediatrics and Population Sciences
Director, Center for Survivorship and Outcomes,
Hematologic Malignancies and Stem Cell Transplantation Institute
City of Hope Comprehensive Cancer Center

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Snapshot: Cancer Care 25 Years Ago

- Cancer treated primarily based on **location, characteristics under the microscope** and **size**; few biomarkers
- Roughly **250 fewer treatment options than today**
- Three **basic treatment modalities**
- **Limited supportive care options**

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Since the 1990s: Progress by Many Measures

Treatment

- New therapies
- Imaging, radiation oncology and surgery advances
- Precision medicine
- Immunotherapy

Prevention

- Interventions for infection-related cancers
- Cancer susceptibility genes
- Drug and surgical risk reduction strategies

Quality of Life

- Better toxicity management
- Less intensive therapies
- Palliative care integration

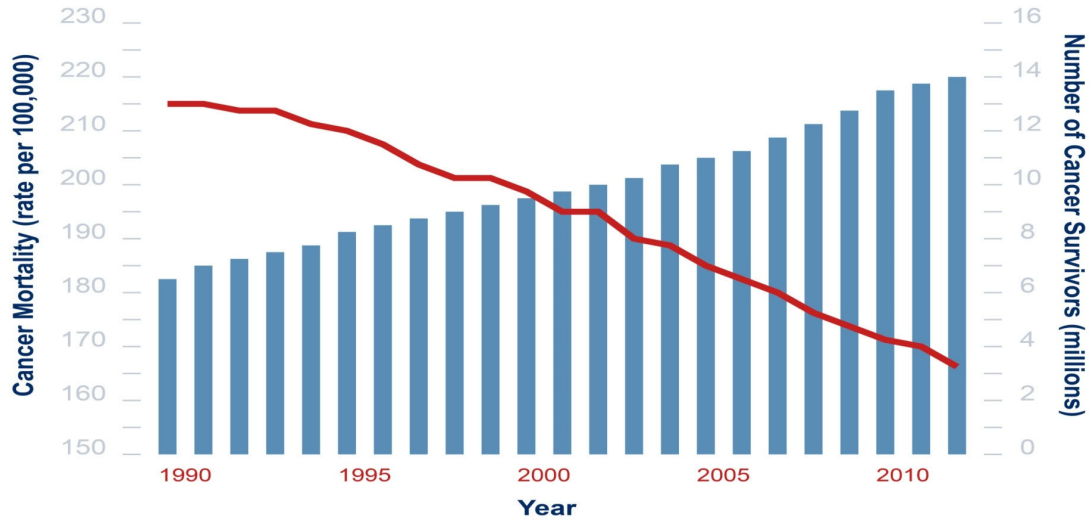
Survivorship

- Growing research area
- Late effects identified
- Surveillance strategies established

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Since the 1990s: Mortality Down, Survivorship Up

In the United States...



Sources: US Mortality Files, National Center for Health Statistics, CDC. DeSantis C, Chunchieh L, Mariotto AB, et al. (2014). Cancer Treatment and Survivorship Statistics, 2014. CA: A Cancer Journal for Clinicians.

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Cancer Survivors: Growing numbers, Living Longer

Five-Year Survival Rates by Treatment Era

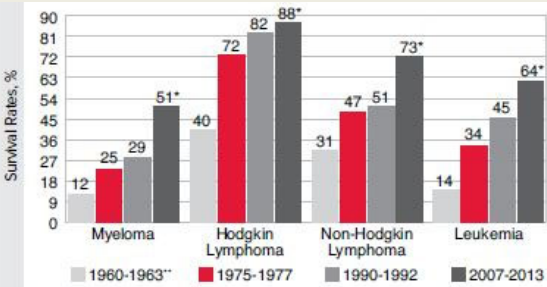
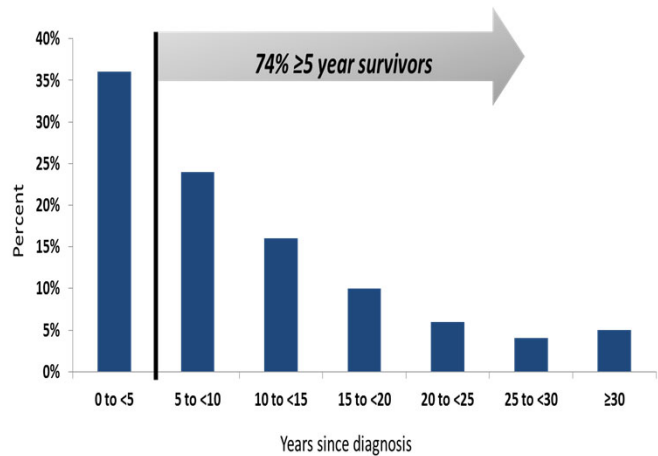


Figure 2. Source: SEER (Surveillance, Epidemiology and End Results) Cancer Statistics Review, 1975-2014. National Cancer Institute; 2017.

*The difference in rates between 1975-1977 and 2007-2013 is statistically significant ($p < .05$).

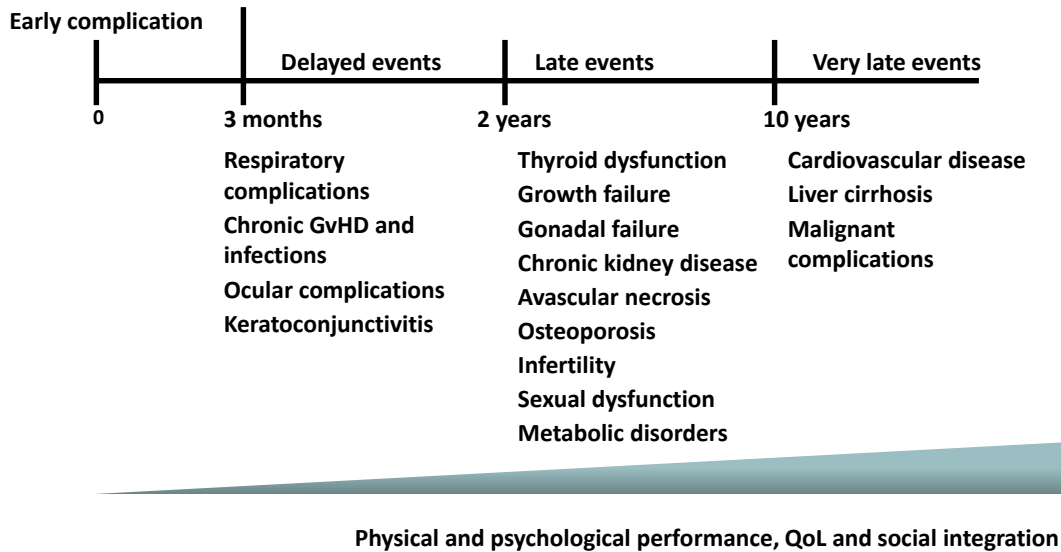
**Survival rate among whites.



Cancer Epidemiol Biomarkers Prev; 22(4); 561-70. ©2013 AACR.

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Late-Occurring Health Complications after HCT



Expert Rev Hematol. 2(5), 2009

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Health Risks Associated with Treatment

- Many long-term survivors will develop one or more long-term health problems
- Conditions are often under-appreciated in the general medical community
- Important to catch problems early, when they are most easily treated



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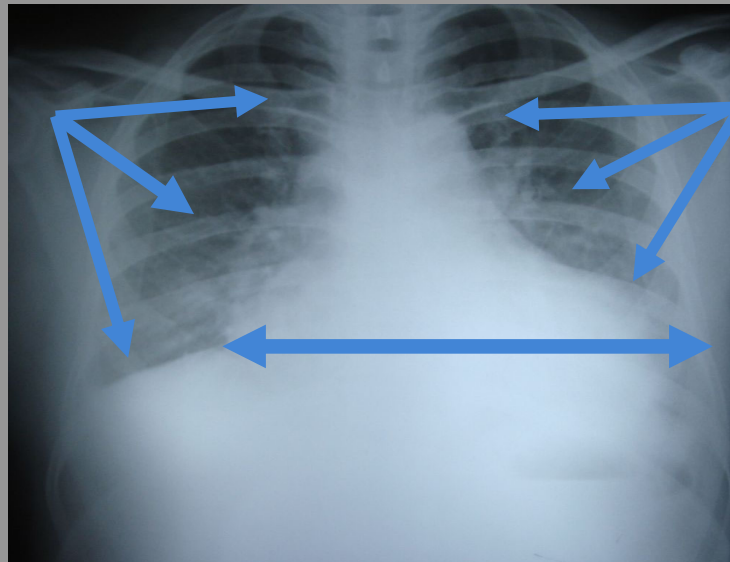


Patient DY

27 years old at diagnosis
Underwent Autologous Transplantation for
Recurrent Lymphoma

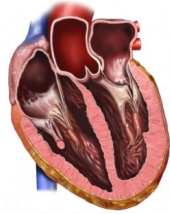
*Concerned about shortness of breath and easy fatigue
during soccer practice*

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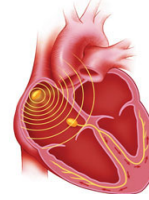
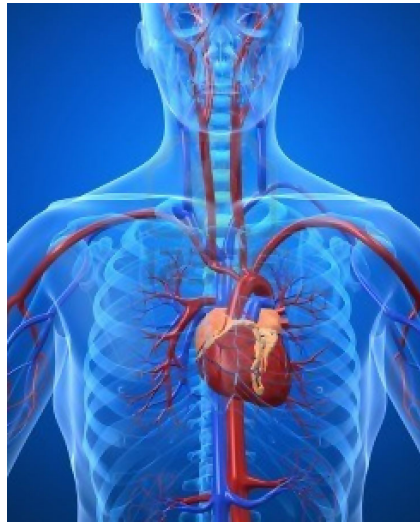
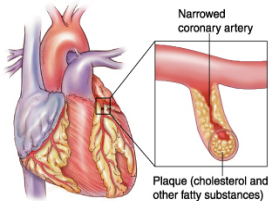
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Cardiovascular Disease

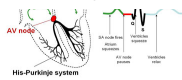


Cardiac
Dysfunction

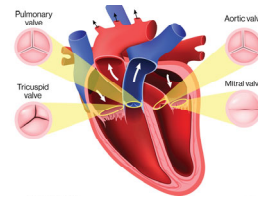
Atherosclerosis



Arrhythmia



Valvular disease



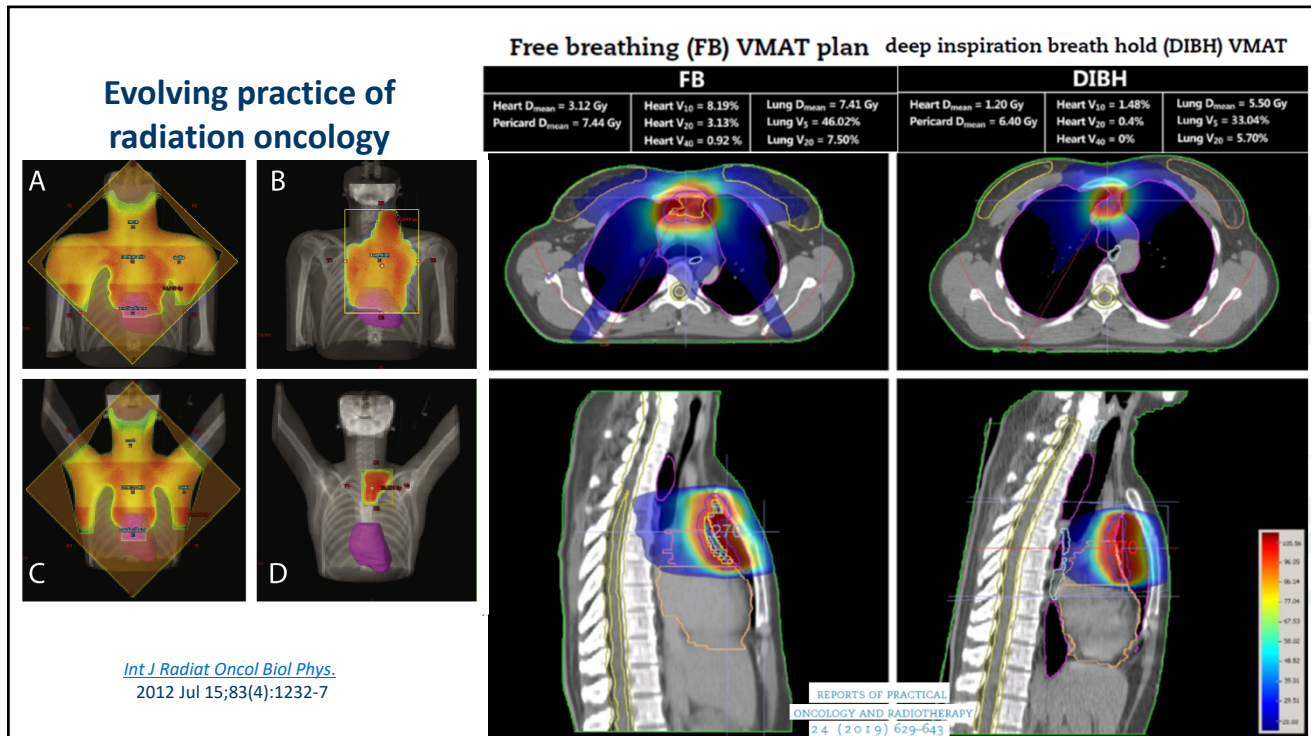
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Cardiovascular Disease: Risk Factors

- Risk of heart disease in HCT survivors
 - 2-4 times greater risk compared to the general population
- Who is at risk?
 - Treatment: chest radiation (near heart), high dose anthracycline chemotherapy, older treatment era (pre-1990)
 - Patient characteristics
 - Very young (<18y) or older age (>70y) at treatment
 - Traditional cardiovascular risk factors (hypertension, diabetes, obesity)
 - Lifestyle: sedentary behavior, smoking



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Cardiovascular Disease: Risk Factors

- Typical onset
 - Can occur early during transplantation, but typically >5y after
- What are the symptoms
 - **Heart failure:** swelling of extremities, shortness of breath, reduced ability to exercise/strenuous activity, fatigue/weakness
 - **Coronary artery disease:** chest pain or discomfort, shortness of breath, pain or discomfort (arms/shoulder), nausea, weakness
 - **Valvular disease:** Shortness of breath, chest pain, fatigue, fainting/dizziness, irregular heartbeat



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Cardiovascular Disease Prevention

- **Screening**
 - **Risk-based surveillance**
 - History & Physical
 - Echocardiography
 - ECG
- **Management of Risk Factors**
 - **Hypertension**
 - **Diabetes**
 - **Dyslipidemia**
- **Prevention as the long-term goal**

Number of persons with CV risk factors

What can a patient do?

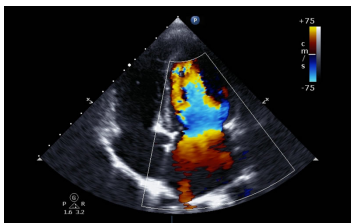
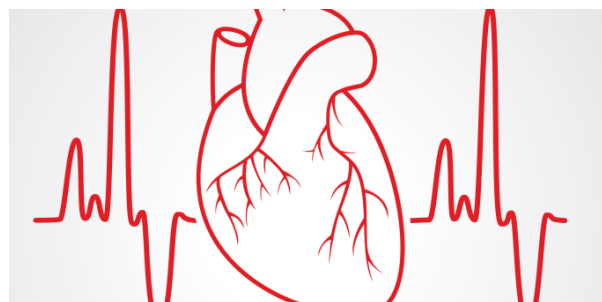
- **Heart-healthy lifestyle**
 - Heart-healthy diet
 - Smoking cessation
 - Physical activity
- **Compliance in treatment of CV risk factors**

Hypertension

Dyslipidemia

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Screening for Heart Disease

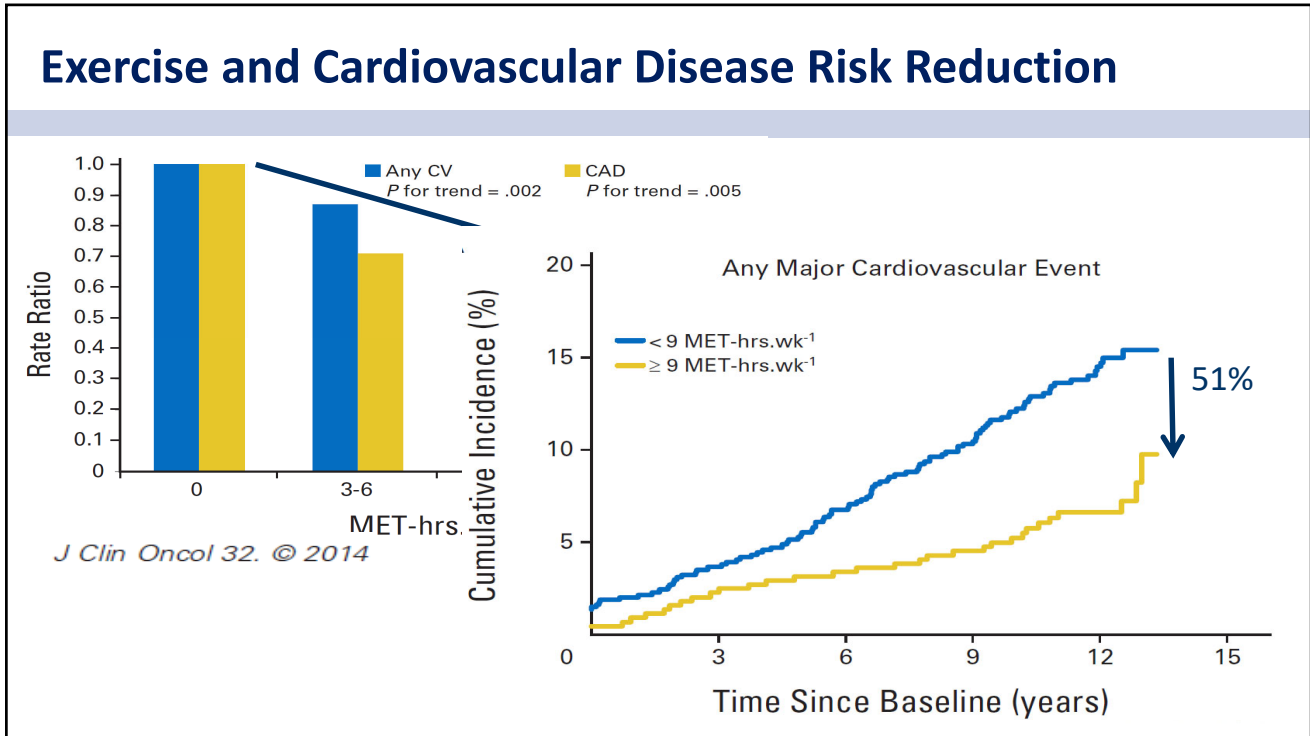


Consideration:

- Previous treatment with high dose anthracycline chemotherapy (Doxorubicin, Daunomycin) at a young age
- Chest radiation therapy in earlier treatment eras (<1990)
- Concerning symptoms during strenuous activities

<https://www.heart.org/en/health-topics/heart-attack/diagnosing-a-heart-attack/echocardiogram-echo>

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2019 Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable.

Expected benefits for different types of exercise

Aerobic only	Resistance only	Aerobic plus Resistance
↓ anxiety	↓ fatigue	↓ anxiety
↓ depressive symptoms	↑ quality of life	↓ depressive symptoms
↓ fatigue	No risk of exacerbating lymphedema	↓ fatigue
↑ quality of life	↑ perceived physical function	↑ quality of life
↑ perceived physical function		↑ perceived physical function

Campbell KL, Winters-Stone KM et al, Med Sci Sport Ex 2019;

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Remember

“If you are going to make exercise part of your life, you have a long time to get fit and you must slowly and steadily develop a routine you enjoy”

Schwartz, Anna L. (2004) Cancer Fitness: Exercise Programs for Patients and Survivors.
New York, NY: Fireside: P.136



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Exercise Guidelines

Stop exercise and contact your doctor if you have:

- Disorientation, dizziness, blurred vision or fainting
- Sudden onset of nausea, vomiting
- Unusual or sudden shortness of breath
- Irregular heartbeat, palpitations, chest pain
- Leg/calf pain, bone pain, unusual joint pain or pain not caused by injury
- Muscle cramps or sudden onset of muscular weakness or fatigue

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What Can You Do?

- Avoid inactivity
- Get individually tailored exercise program from a physical therapist or personal trainer who is certified as a trainer for cancer patients. Especially recommended for survivors who are still in their cancer treatment.
- Take a program designed for cancer survivors (LIVESTRONG at the YMCA, Exercise & Thrive, etc.)

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What Can You Do?

- Take a walk with your friends. Work out with a DVD, TV program or YouTube (search example ...“low impact aerobic exercise”, “chair exercise”)
- Ride your bike, mow the grass, rake the leaves, walk a dog, dance, park your car in the farthest parking place, use stairs, get off the bus several stops early
- Take classes at local Centers and YMCA. (Gentle Yoga, Tai chi, EnhanceFitness Class, Fall prevention class. These are gentle-enough so they are perfect as a start.)

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Changing paradigms in healthcare delivery

Traditional paternalistic model of care

Empowered
Physician

Empowered
Patient

- Patient completely reliant on HCP to receive information, diagnosis and referral
- Difficult for patients to navigate within and between health and social care
- Interventions usually in response to physical evidence from patient



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Changing paradigms in healthcare delivery

Empowered patient sharing ownership

Empowered
Physician

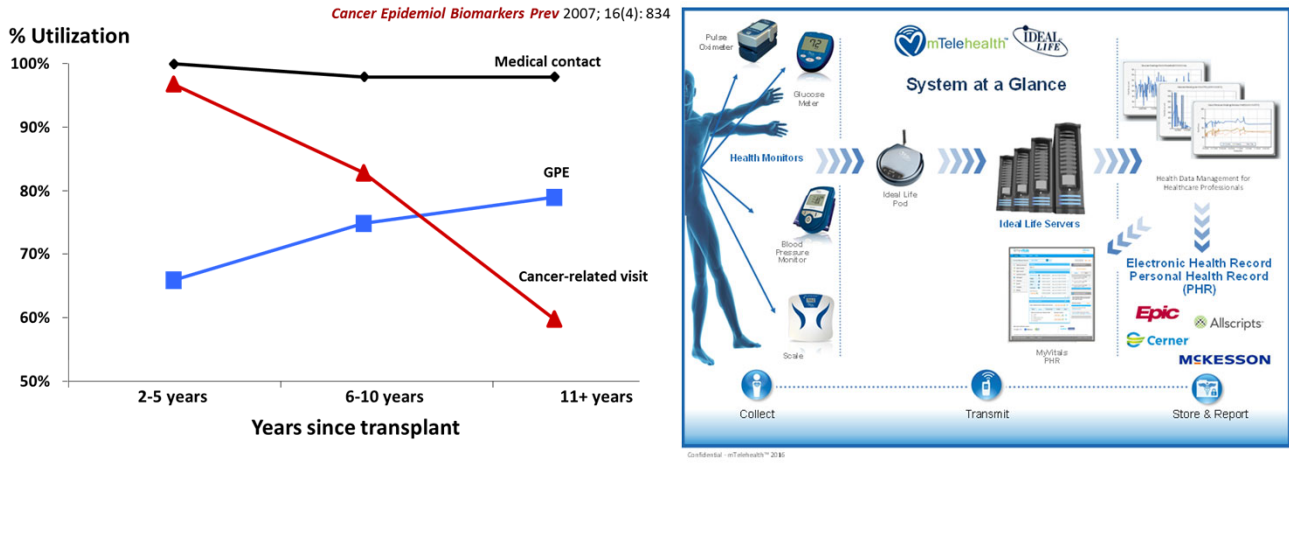
Empowered
Patient

- Patient informed whenever and wherever, using their interoperable medical record
- Co-creation of care packages, proactive prevention, rapid access to services
- Technology enabled support and self-management



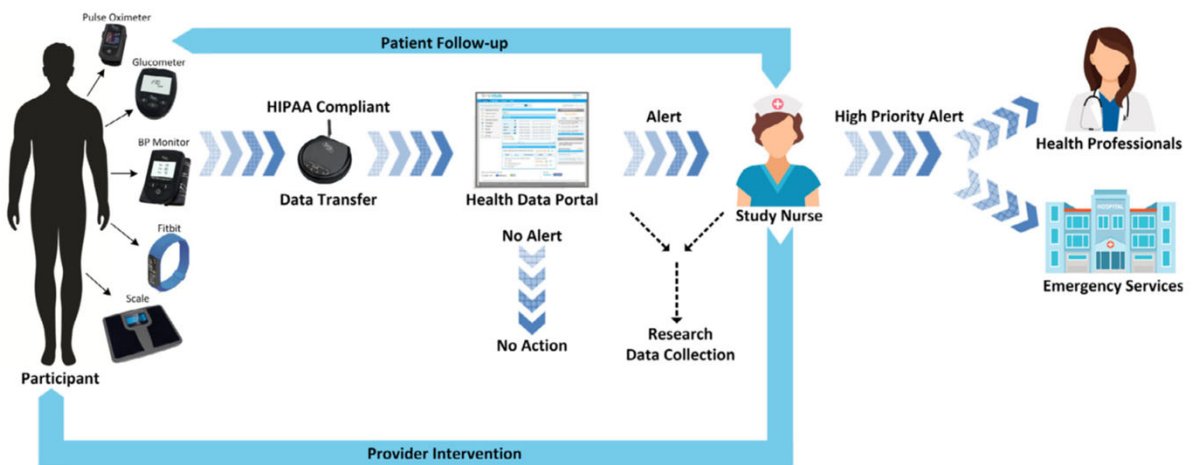
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Challenges to Monitoring & Delivery of HCT Survivorship Care



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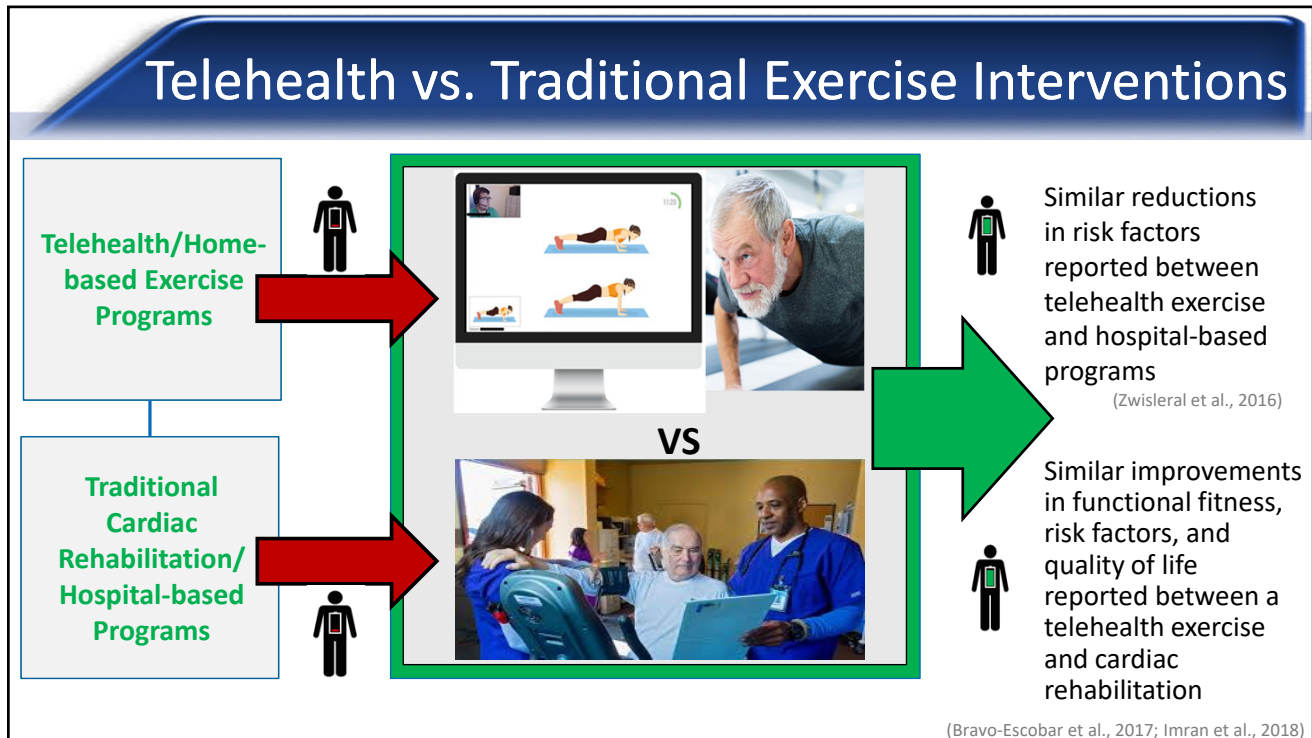
Technology-Enabled Monitoring & Comprehensive Care



Biol Blood Marrow Transplant. 2020 Jun;26(6):1233-1237



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What we encourage our patients to do

- Learn about the treatment they received
- Get regular check-ups focusing on the health risks related to their cancer treatment
- Work with healthcare providers to develop a long-term follow-up plan
- Make healthy choices

“You are the most important member of your healthcare team!”

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Thank you!



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Questions?

Celebrating a Second Chance at Life
Survivorship Symposium 2021



bmtinfonet.org ♦ help@bmtinfonet.org ♦ 847-433-3313

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