



FORUM EUROPÉEN CŒUR, EXERCICE & PRÉVENTION

Modalités Pratiques

AP chez le cancéreux

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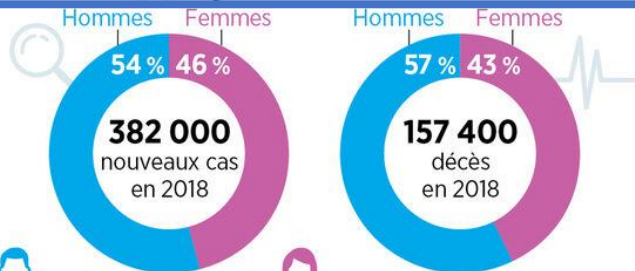
Aucun Conflits d'intérêts



Cancer : la situation en France



3,8 millions de personnes ont ou ont eu un cancer



Chez les hommes

Diminution des nouveaux cas entre 2010 et 2018 :
- 1,4 % par an

Cancers causant le plus de décès

- 1 Poumon
- 2 Colorectal
- 3 Prostate

Chez les femmes

Ralentissement des nouveaux cas mais toujours
+ 0,7 % par an

Cancers causant le plus de décès

- 1 Sein
- 2 Poumon
- 3 Colorectal

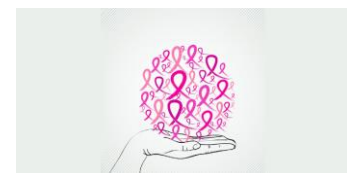
A l'horizon 2025, le cancer du poumon pourrait devenir le plus meurtrier chez les femmes

40 % des nouveaux cas sont **évitables car liés à nos modes de vie** (tabac, alcool, alimentation déséquilibrée...)

44,4 % des malades ont une **qualité de vie dégradée** cinq ans après le diagnostic d'un cancer

SOURCES : INCA ET SANTÉ PUBLIQUE FRANCE.

LP/INFOGRAPHIE - T.H.



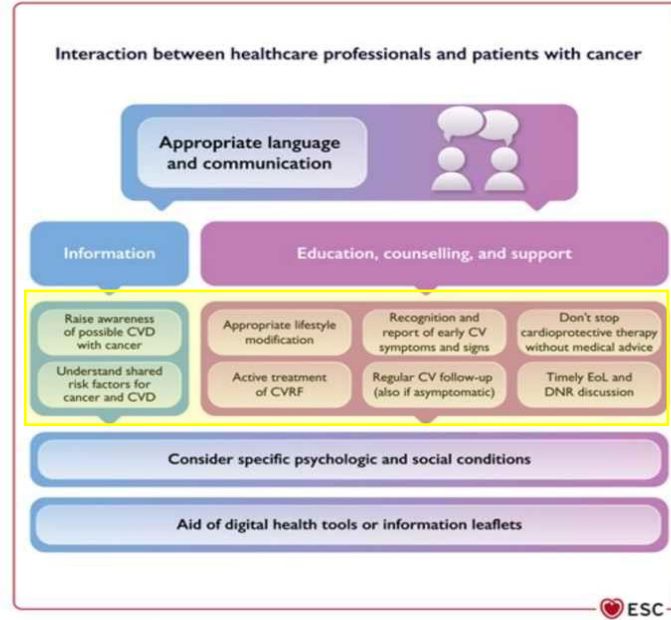
Recommendation Table 5 Recommendations for primary prevention of cancer therapy-related cardiovascular toxicity

Recommendations	Class ^a	Level ^b
Management of <u>CVRF</u> according to the 2021 ESC Guidelines on CVD prevention in clinical practice is recommended before, ^c during, and after cancer therapy. ¹⁹	I	C
Dexrazoxane should be considered in adult patients with cancer at high and very high CV toxicity risk when anthracycline chemotherapy is indicated. ^{d,158}	IIa	B
Liposomal anthracyclines should be considered in adult patients with cancer at high and very high CV toxicity risk when anthracycline chemotherapy is indicated. ^{e,164,165,168}	IIa	B

2022 ESC Guidelines on cardio-oncology developed in collaboration with the European Hematology Association (EHA), the European Society for Therapeutic Radiology and Oncology (ESTRO) and the International Cardio-Oncology Society (IC-OS): Developed by the task force on cardio-oncology of the European Society of Cardiology (ESC)

Alexander R Lyon et al. European Heart Journal, Volume 43, Issue 41, 1 November 2022, Pages 4229–4361,

Figure 47



Education
CORE

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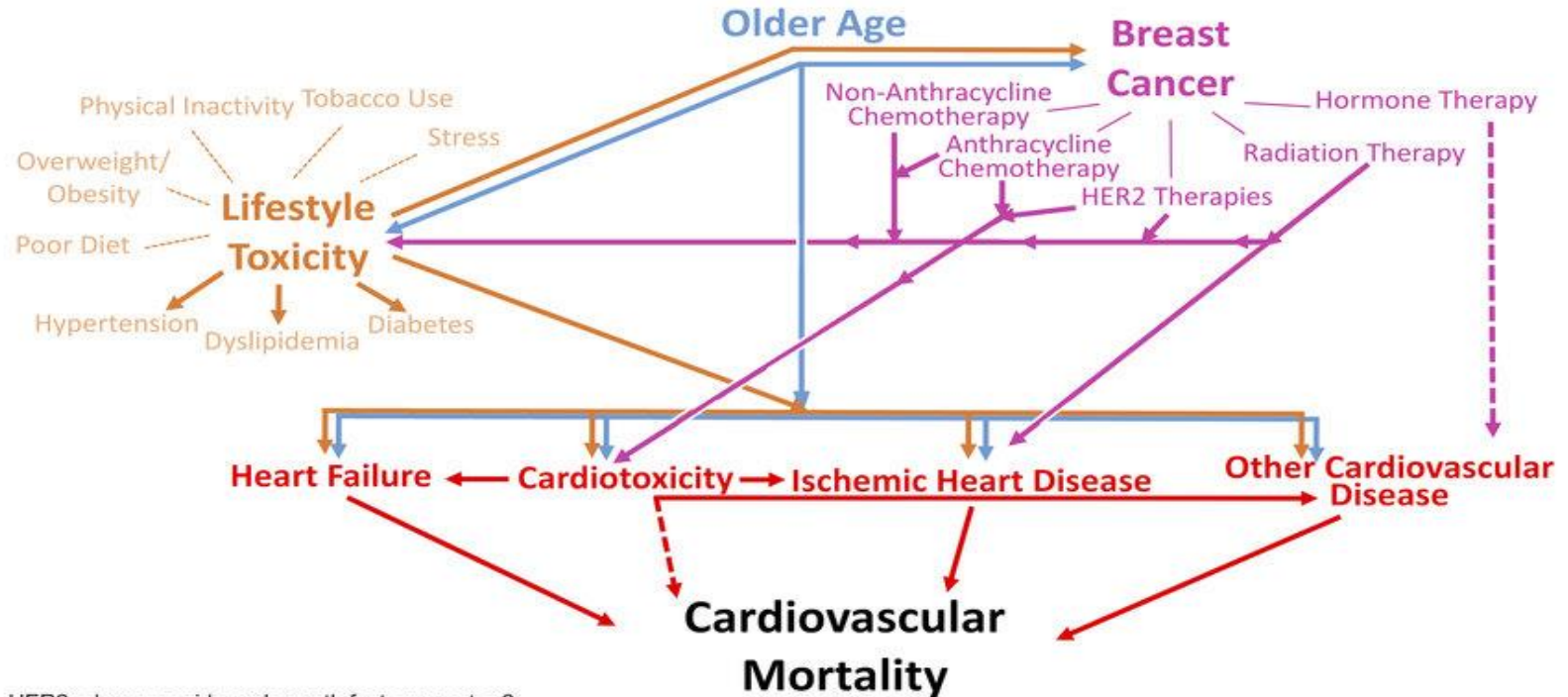
Patient information, communication, and self-management.

CV, cardiovascular; CVD, cardiovascular disease; CVRF, cardiovascular risk factors; DNR, do not resuscitate; EoL, end of life.

2022 ESC Guidelines on cardio-oncology developed in collaboration with the European Hematology Association (EHA), the European Society for Therapeutic Radiology and Oncology (ESTRO) and the International Cardio-Oncology Society (IC-OS): Developed by the task force on cardio-oncology of the European Society of Cardiology (ESC)
Alexander R Lyon et al. *European Heart Journal*, Volume 43, Issue 41, 1 November 2022, Pages 4229–4361,



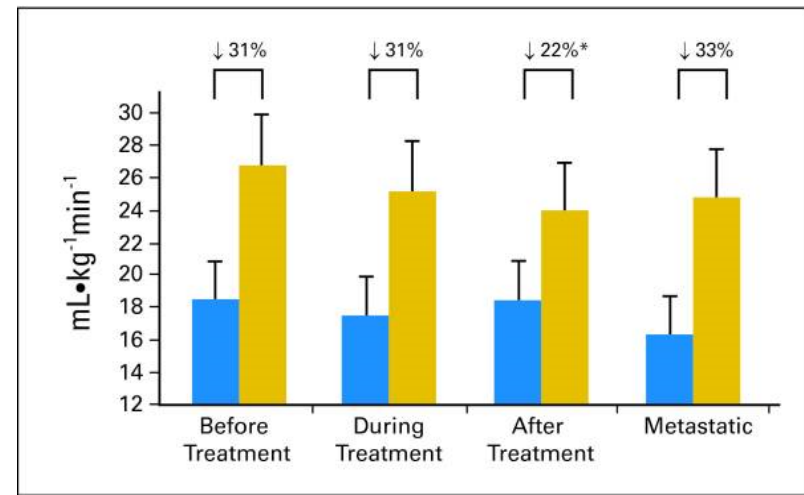
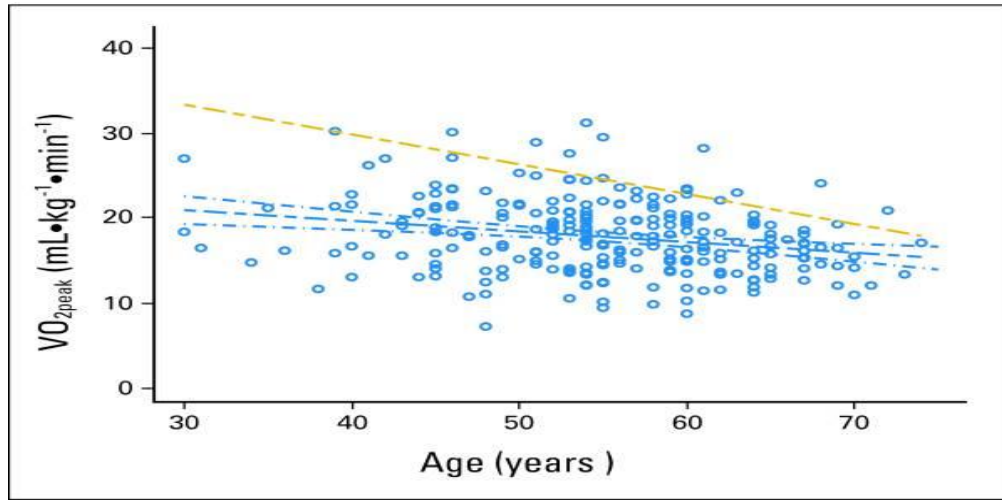
Figure 1: Interaction of risk factors for elevated cardiovascular mortality in women diagnosed with breast cancer



HER2 = human epidermal growth factor receptor 2

Curing breast Cancer and killing the heart: A novel model to explain elevated cardiovascular disease and mortality risk among women with early stage breast Cancer., Kairkham A. et al. Research gate, 2019





Pic moyen de VO2
 40 ans 19,7ml/kg/min
 70 ans sans cancer 19,3ml/kg/min

Pic de VO2 moyen
 $17,8 \pm 4,3 \text{ mL} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$
 = inférieur de 27 % femmes sédentaires, appariées du même age bonne sante sans carcinome mammaire

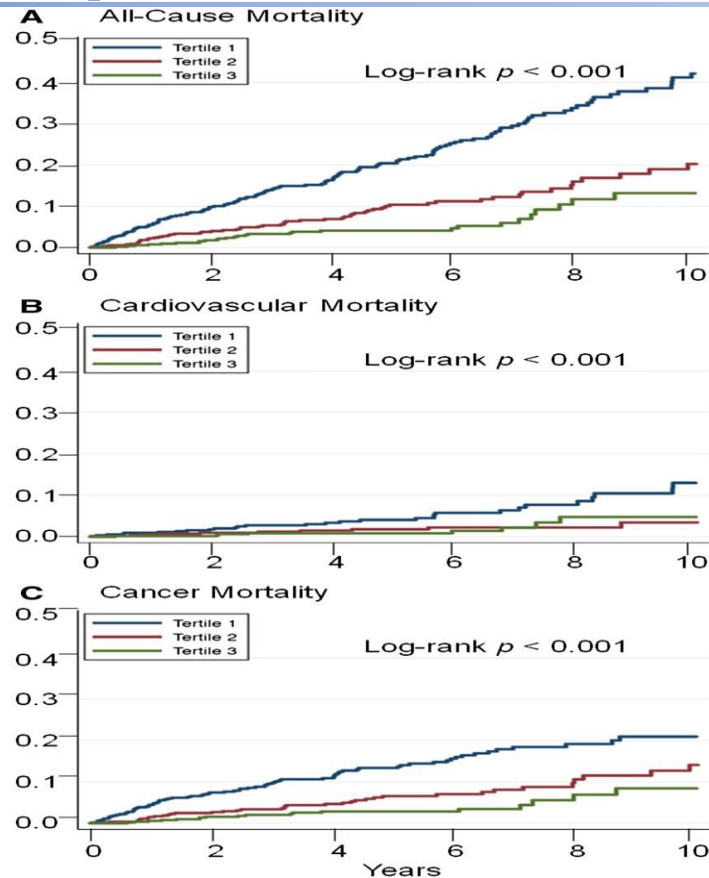
Surtout pdt chimio et stade IV

1/3 femmes ont un pic de VO2 inférieur au pic d'indépendance fonctionnelle 15ml/kg/min

Mortalité cardio vasculaire / fonction capacité cardio-respiratoire

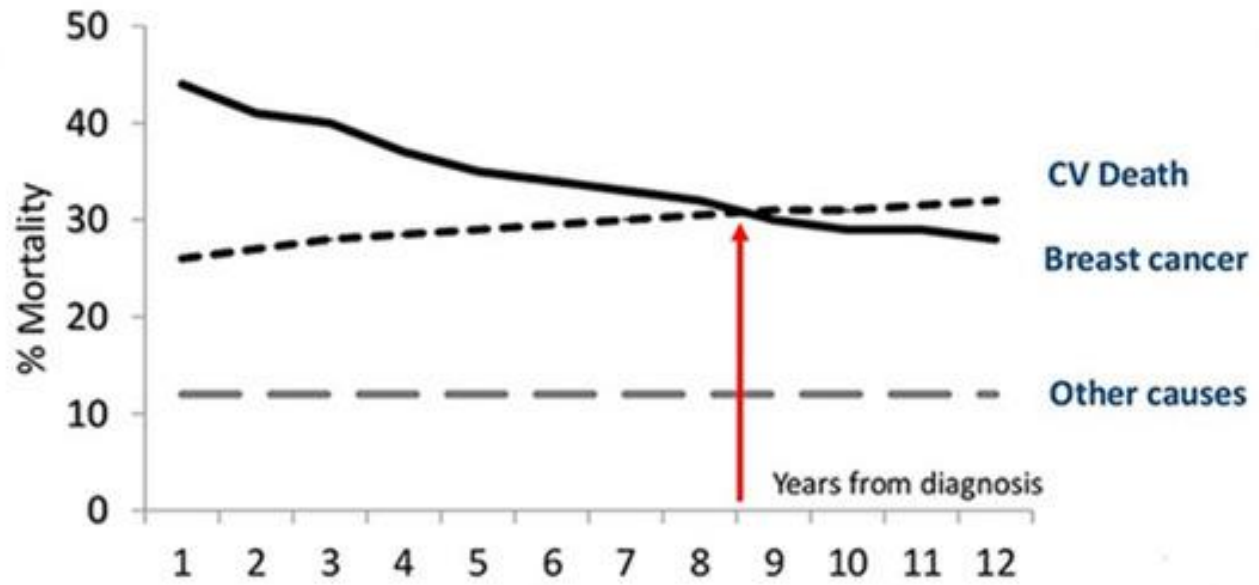
Probability of all-cause mortality (A), cardiovascular mortality (B), and cancer mortality (C) in cancer patients according to cardiorespiratory fitness tertiles achieved during exercise treadmill testing:

low cardiorespiratory fitness (blue line),
intermediate cardiorespiratory fitness (red line),
and high cardiorespiratory fitness (green line).



Association of post-diagnosis cardiorespiratory fitness with cause-specific mortality in cancer. Groarke JD and al. *European Heart Journal - Quality of Care and Clinical Outcomes*, Volume 6, Issue 4, October 2020, Pages 315–322

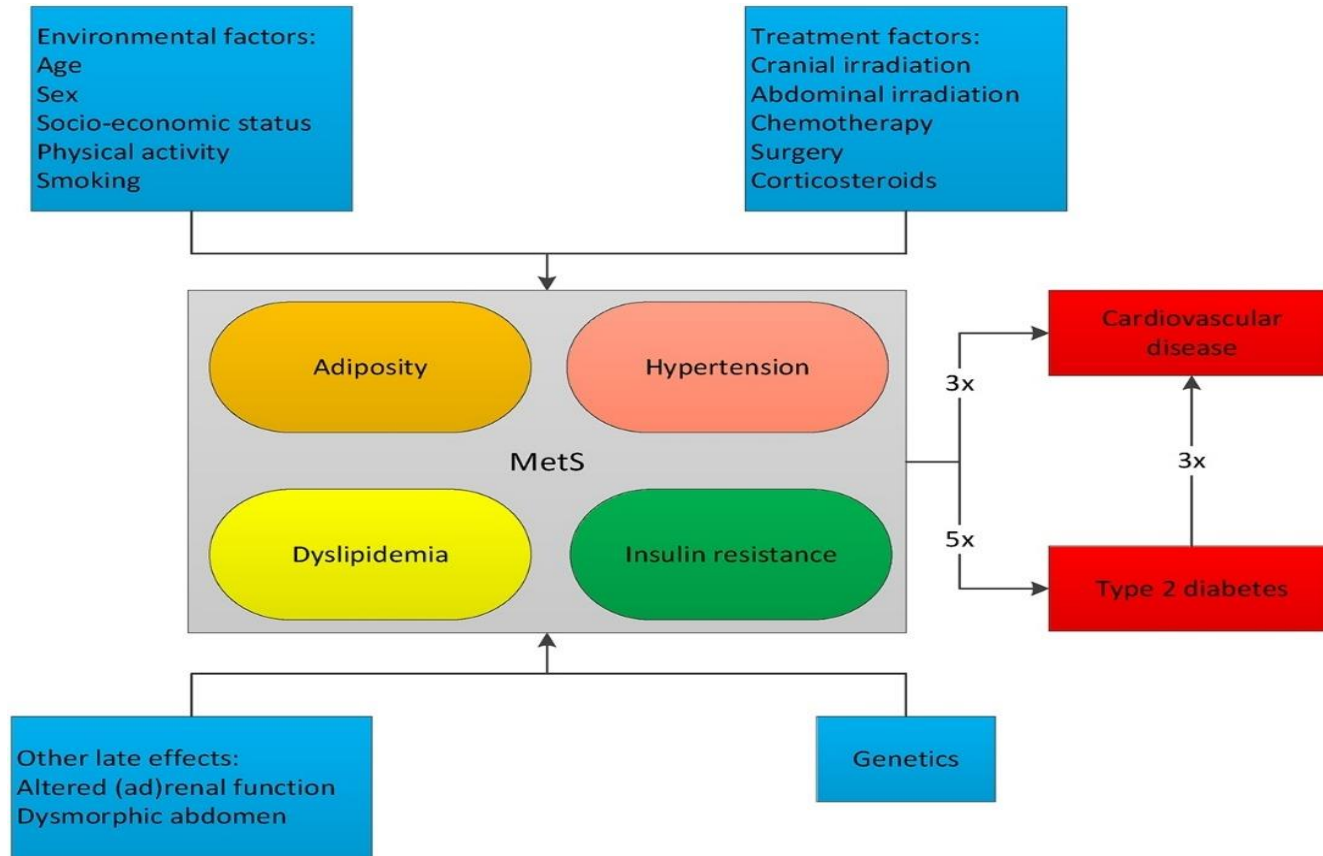




Cardiovascular disease competes with breast cancer as the leading cause of death for older females diagnosed with breast cancer: a retrospective cohort study. Patnaik JL. And al. Breast Cancer Research 2011.



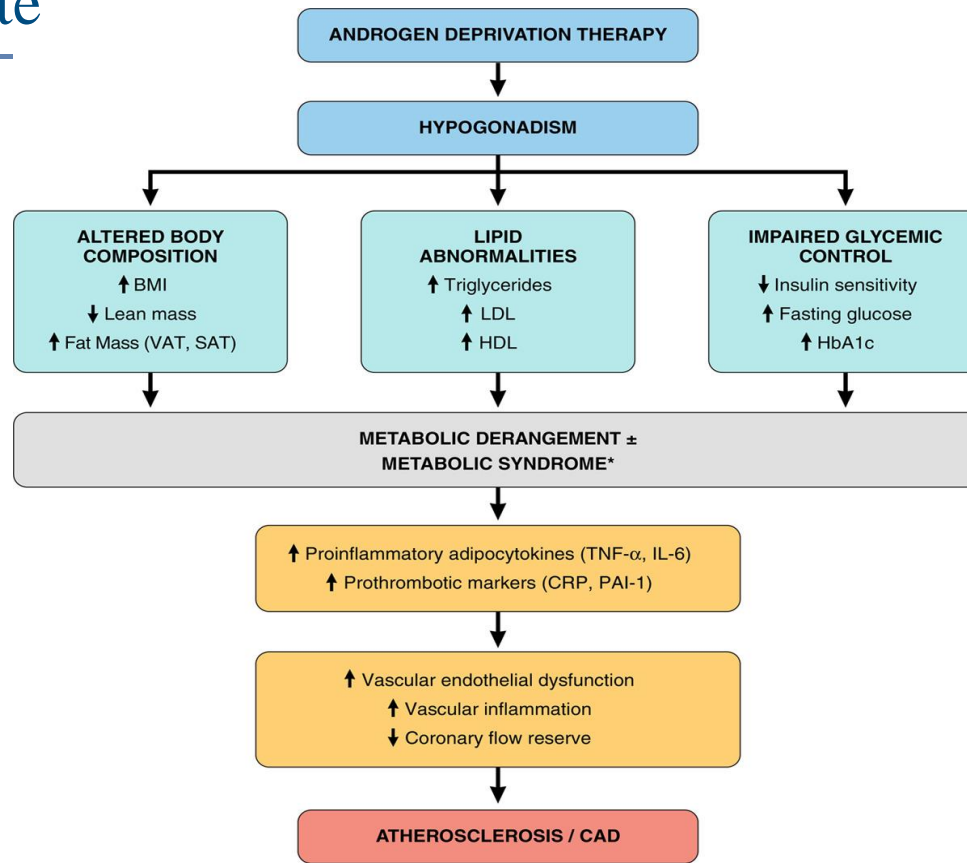
Risque MCV et hémopathie maligne



Metabolic syndrome as cardiovascular risk factor in childhood cancer survivors. Pluimakers VG and al. Critical Reviews in Oncology/Hematology Vol. 133 Jan. 2019, Pages 129-141

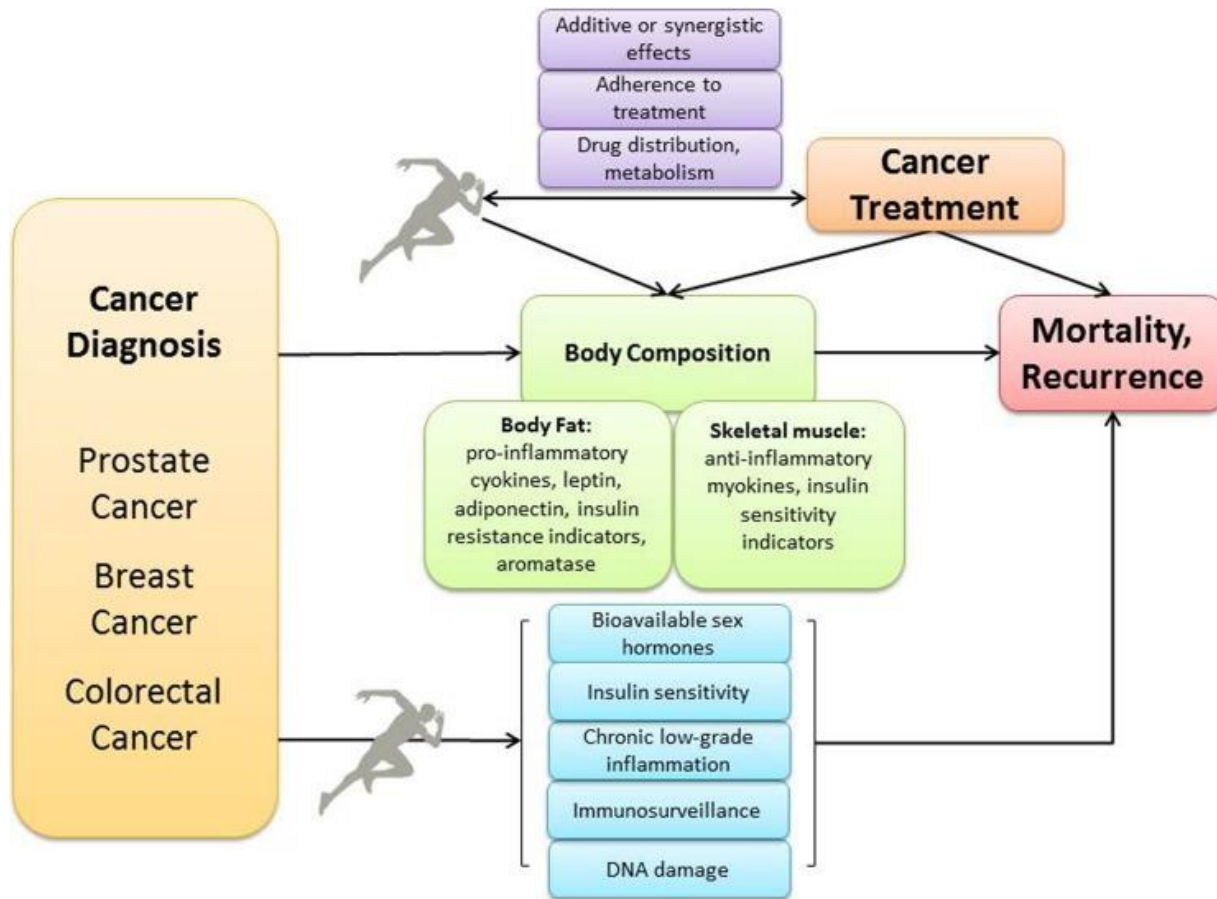


Cancer de prostate



Tochi M. Okwuosa. *Circulation: Genomic and Precision Medicine. Impact of Hormonal Therapies for Treatment of Hormone-Dependent Cancers (Breast and Prostate) on the Cardiovascular System: Effects and Modifications: A Scientific Statement From the American Heart Association, 2021, Volume: 14, Issue: 3.*





Ficarra S. et al Impact of exercise interventions on physical fitness in breast cancer patients and survivor a systematic review breast cancer. 2022



AP pour quels types de cancers ?

Table 1. Studies of Exercise on Clinical and CVD Outcomes in Patients With Cancer in the Adjuvant and Postadjuvant Setting (Table view)

Setting	Clinical Outcomes	Cardiovascular Outcomes
Adjuvant		
Breast	↓ CVD events ²² ↓ CAD mortality ²²	↑ ²³ □ ²⁴ ↓ ²⁵ CRF ↓ LVEF ²⁶
Prostate		↑ CRF ²⁷
Colorectal		↑ CRF
Mixed (meta-analysis)		↑ CRF ²¹
Postadjuvant		
Breast	↓ CVD events ²⁸ ↓ All-cause mortality ²⁹	□ ↑ CRF ↑ Vascular function
Prostate		↑ CRF ³⁰ ↑ Vascular function ³⁰ □ Lipid profile ³⁰ □ Blood pressure ³⁰
ASCC	↓ CVD events ³¹ ↓ All-cause mortality ³¹	
Testicular		↑ CRF ³² ↑ Vascular function ³² ↑ Framingham Risk Score ³²
Colorectal	↓ All-cause mortality ²⁹	↑ ³³ □ ³⁴ CRF
Leukemia		↑ CRF ³⁵
Lymphoma		↑ CRF ³⁶
Mixed (meta-analysis)		↑ CRF ²¹

Susan C. Gilchrist. *Circulation. Cardio-Oncology Rehabilitation to Manage Cardiovascular Outcomes in Cancer Patients and Survivors: A Scientific Statement From the American Heart Association, Volume: 139, Issue: 21, Pages: e997-e1012*



Phase 1/2/3



Impact sur la fatigue

20 studies

1793 breast cancer

Per chimiotott radiott

Exercice combined AT RT supervised > separated

Seule manière de lutter contre la « fatigue dite cancéro-induite »

Sieste

#Anti-Depresseurs

Table 3 Post-intervention data, number of participants (n), mean and standard deviation (SD) for fatigue in different types of physical exercises, and standardized mean difference (SMD) with CI 95% using the random effects model with associated levels of heterogeneity (I²)

Study and year	Intervention		Control		SMD (95% CI)	% weight
	N	Mean (SD)	N	Mean (SD)		
Supervised RT exercises						
Courneya et al. 2007	76	= 36.3 (9.4)	73	= 34.9 (12.5)	= 0.13 (= 0.45, 0.19)	23.85
Schmidt et al. 2014	49	36.1 (20.6)	46	44.8 (21.0)	= 0.42 (= 0.83, = 0.01)	14.90
Steindorf et al. 2014	77	5.4 (2.3)	78	5.9 (1.9)	= 0.24 (= 0.55, 0.08)	24.69
Schmidt et al. 2015	21	10.55 (3.22)	26	12.38 (3.50)	= 0.54 (= 1.13, 0.04)	7.18
Mijwel et al. 2018	74	3.16 (2.92)	60	3.94 (2.95)	= 0.27 (= 0.61, 0.08)	21.08
Češeko et al. 2019	27	25.5 (15.5)	28	36.8 (16.7)	= 0.70 (= 1.25, = 0.16)	8.29
Total (95% CI)	324		311		= 0.30 (= 0.46, = 0.15)	100.0
Heterogeneity		Chi ² = 4.36		df = 5 (p = 0.499)	I ² = 0.0%	
Global effect test	Z = 3.80	p = 0.000				
Supervised AT exercises						
Courneya et al. 2007	74	= 36.8 (10.4)	73	= 34.9 (12.5)	= 0.17 (= -0.50, 0.16)	42.20
Moros et al. 2010	10	31.1 (24.4)	7	30.1 (18.9)	0.04 (= 0.92, 1.01)	4.74
Al Majid et al. 2015	6	3.0 (1.96)	6	4.6 (2.20)	= 0.77 (= -1.95, 0.41)	3.18
Schmidt et al. 2015	20	12.35 (4.37)	26	12.38 (3.50)	= 0.01 (= 0.59, 0.58)	13.03
Mijwel et al. 2018	70	3.16 (2.61)	60	3.94 (2.95)	= 0.28 (= -0.63, 0.07)	36.86
Total (95% CI)	180		172		= 0.20 (= 0.41, 0.01)	100.0
Heterogeneity		Chi ² = 1.81		df = 4 (p = 0.771)	I ² = 0.0%	
Global effect test	Z = 1.83	p = 0.067				
Supervised RT + AT exercises						
Campbell et al. 2005	10	2.43 (1.94)	9	4.35 (3.48)	= 0.69 (= 1.62, 0.24)	22.48
Travier et al. 2015	91	11.82 (4.23)	82	12.74 (3.69)	= 0.23 (= -0.53, 0.07)	27.73
Van Waart et al. 2015	71	13.1 (3.9)	66	14.7 (4.2)	= 0.40 (= 0.73, = 0.06)	27.53
Waked et al. 2016	23	3.91 (1.64)	23	8.7 (0.9)	= 3.62 (= -4.57, -2.67)	22.26
Total (95% CI)	195		180		= 1.13 (= 2.09, = 0.17)	100.0
Heterogeneity	Tau ² = 0.841	Chi ² = 44.91		df = 3 (p = 0.000)	I ² = 93.3%	
Global effect test	Z = 2.32	p = 0.021				
Supervised MB exercises						
Vadinja et al. 2009	42	31.37 (21.79)	33	52.09 (24.24)	= 0.90 (= -1.38, -0.43)	33.46
Chen et al. 2014	49	3.1 (2.0)	47	2.7 (2.1)	0.20 (= 0.21, 0.60)	34.20
Tsuo et al. 2014	30	10.9 (6.9)	30	20.4 (5.0)	= 1.58 (= -2.16, -0.99)	32.34
Total (95% CI)	121		110		= 0.75 (= 1.78, 0.28)	100.0
Heterogeneity	Tau ² = 0.765	Chi ² = 27.33		df = 2 (p = 0.000)	I ² = 92.7%	
Global effect test	Z = 1.42	p = 0.155				
Unsupervised AT exercises						
Mock et al. 2005	54	3.5 (2.4)	54	3.7 (2.6)	= 0.08 (= 0.46, 0.30)	24.21
Reis et al. 2013	12	= 45.2 (5.32)	17	= 42.3 (7.84)	= 0.42 (= -1.17, 0.33)	15.82
Naraphong et al. 2015	9	3.62 (2.07)	12	3.38 (2.75)	0.10 (= -0.77, 0.96)	13.67
Van Waart et al. 2015	69	13.7 (3.9)	66	14.7 (4.2)	= 0.25 (= -0.39, 0.09)	25.09
Wang et al. 2011	35	= 45.81 (4.29)	37	= 39.91 (5.38)	= 1.21 (1.71, = 0.70)	21.20
Total (95% CI)	179		186		= 0.40 (= -0.83, 0.05)	100.0
Heterogeneity	Tau ² = 0.167	Chi ² = 14.55		df = 4 (p = 0.006)	I ² = 72.5%	
Global effect test	Z = 1.76	p = 0.079				
Unsupervised RT + AT exercises						
Husebo et al. 2014	29	12.01 (4.38)	31	13.13 (4.47)	= 0.25 (= 0.76, 0.26)	
Total (95% CI)	29		31		= 0.25 (0.76, 0.26)	

RT, resistance training; AT, aerobic training; MB, mind-body exercises; RT+AT, combined resistance and aerobic training



Quand pratiquer une activité physique pour un patient atteint de cancer en cours de traitement pour améliorer sa cap. Cardio-respiratoire ?

Pendant? Ou après ? Ou Pendant et après ?

Etude randomisée

158 patientes inactives

Cancer du sein

Chimiothérapie adjuvante ou néo-adjuvante

- *Usual care*
- *Concurrent (pendant la chimiothérapie uniquement)*
- *Sequential (après chimiothérapie)*
- *Concurrent and sequential ? (continu, pendant et après la chimiothérapie)*

Key question(s)

What is the most appropriate timing of exercise therapy (ETx) to improve cardiorespiratory fitness (CRF) in cancer patients initiating adjuvant chemotherapy?

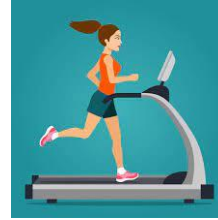
Key finding(s)

In this randomized controlled trial of 158 patients with primary breast cancer, concurrent (during chemotherapy only) and sequential (after chemotherapy only) had similar CRF benefit.



Activité physique :

- *Tapis roulant 3 fois par semaine*
 - *20/50 minutes à 55/100% du pic VO2*
 - *16 semaines pendant ou après la chimiothérapie (sequential and concurrent)*
 - *32 semaines pendant et après traitement (continuous)*
-
- *Objectif primaire:*
 - *évaluation du pic de VO2*
 - *pré traitement (T0)*
 - *Immédiatement après chimiothérapie (T1)*
 - *16 semaines après chimiothérapie T2 puis 32 semaines*



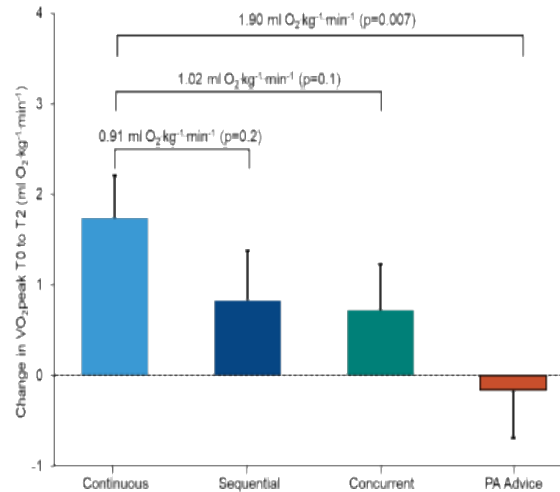
Usual Care vs. During, After, and Continuous Exercise in Newly Diagnosed Breast Cancer Patients

- n=158 breast cancer patients receiving chemotherapy

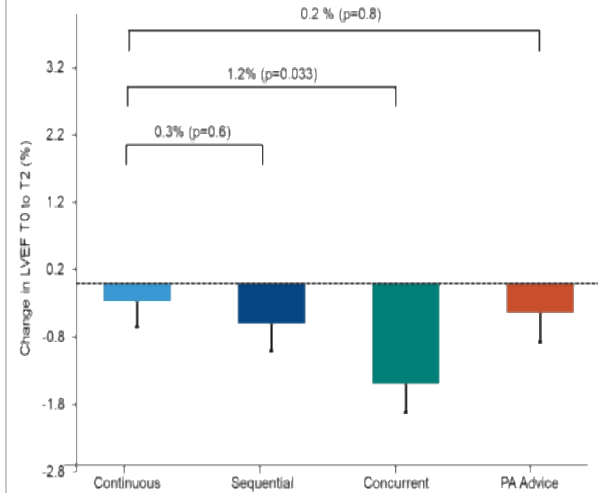
Randomized to ~32 weeks of:



Primary Endpoint: VO_2 peak



Secondary Endpoint: LVEF



Timing of Exercise Therapy in Patients Initiating Adjuvant Chemotherapy for Breast Cancer. Scott J and al. 2023



AP autodéclarée durant le traitement du cancer

Canada

223 femmes Cancer du sein I à III

126 femmes Contrôle (pas de cancer pas de cardiopathie)

. >18 ans

. Surpoids

➤ AP autodéclarée avant et après 3 mois de ttt

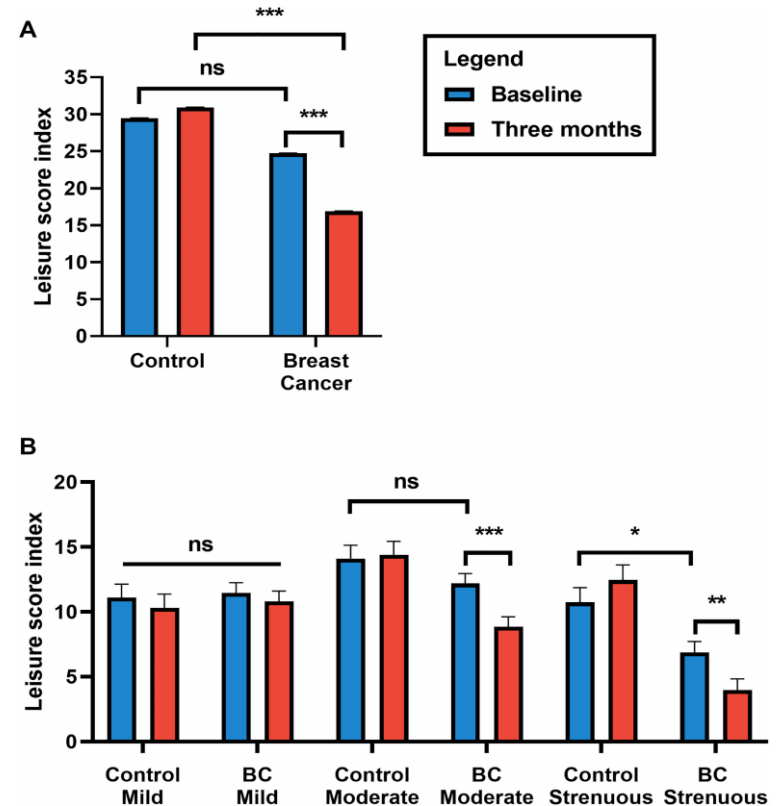
➤ Faible

➤ Modérée

➤ Intense

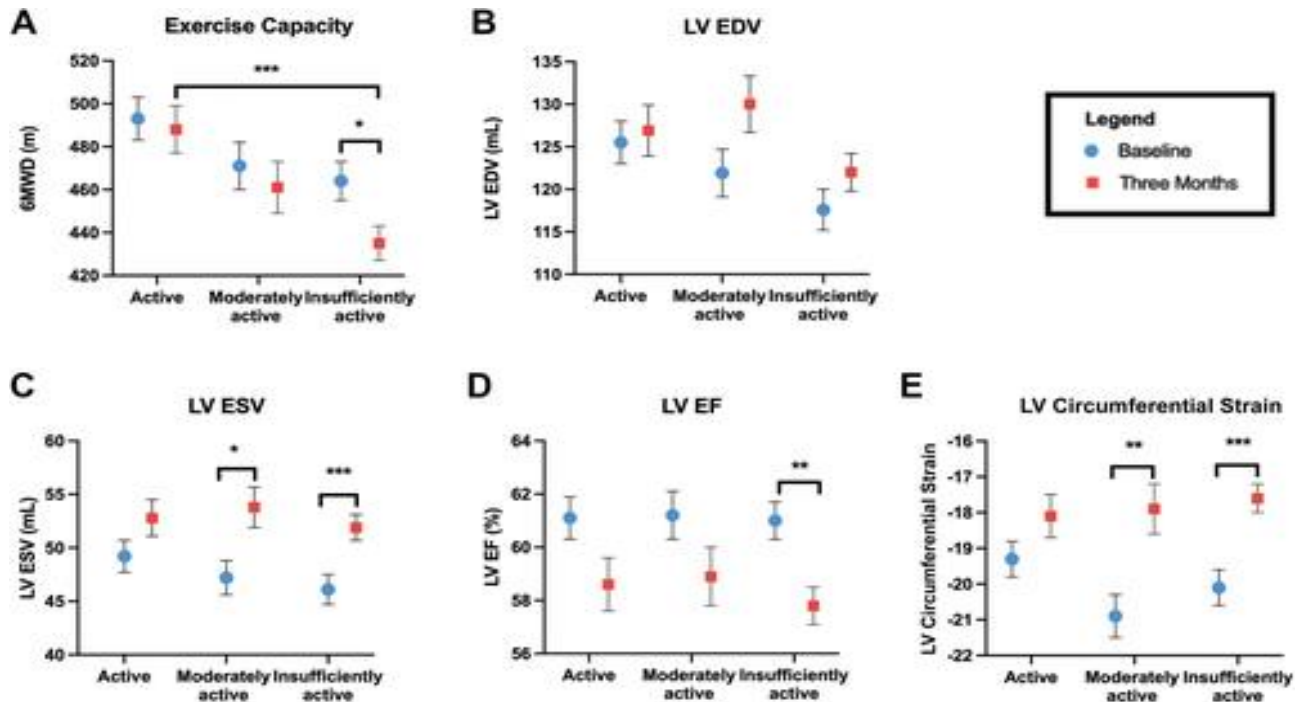
➤ AP auto déclarée en loisir (LPTA)

➤ Relation linéaire F° cardiaque et cap physique



Moriah P. Bellissimo et al. J Am Coll Cardiol CardioOnc 2023; 5:641-652.





Moriah P. Bellissimo et al. *J Am Coll Cardiol CardioOnc* 2023; 5:641-652.



75 patients randomisés Bras UC Vs OCR

53 ans de moyenne âge +/- 12 ans

Intention de traiter

Stop TTT 2 mois avant inclusion

-ATC forte dose

-Radiothérapie forte dose

-ATC faible dose. + anti HER2

-Atcd cmi, fevg modérément altéré ou < 50%

et 2 fdrcv

-Pas de RCV avant

-Durant 8 semaines

OCR (CBCR) : Aérobie, résistance, relaxation, diet, psycho, ETP fdrcv

Groupe communautaire (CBET) : aérobies

Résistance, supervisée



Table 1. Baseline Characteristics of Participants

Characteristic	Patients ^a	
	CBCR (n = 38)	CBET (n = 37)
Age, mean (SD), y	54.5 (13.5)	53.8 (10.7)
Sex		
Female	29 (76.3)	29 (78.4)
Male	9 (23.7)	8 (21.6)
Marital status		
Single	3 (7.9)	4 (10.8)
Married	29 (76.3)	27 (73.0)
Divorced	4 (10.5)	6 (16.2)
Widowed	2 (5.3)	0
Highest educational level		
Elementary school	23 (60.5)	15 (40.5)
High school	12 (31.6)	16 (43.2)
University graduate	3 (7.9)	5 (13.5)
Postgraduate degree	0	1 (2.7)
Work situation		
Employed	23 (60.5)	16 (43.2)
Unemployed	7 (18.4)	12 (32.4)
Retired	8 (21.1)	9 (24.3)
Type of cancer		
Breast	24 (63.1)	26 (70.3)
Colorectal	1 (2.6)	1 (2.7)
Gastric	1 (2.6)	0
Prostate	1 (2.6)	1 (2.7)
Lymphoma	11 (28.9)	9 (24.3)
Solid tumor		
Any	28 (73.7)	27 (73.0)
Stage I	12 (31.6)	16 (43.2)
Stage II	11 (28.9)	5 (13.5)
Stage III	3 (7.9)	6 (16.2)
Stage IV	2 (5.3)	0
Time elapsed between cancer diagnosis and study enrollment, median (IQR), mo	27.0 (14.0-45.5)	25.0 (17.5-38.5)
Cancer treatment		
Chemotherapy	36 (94.7)	34 (91.9)
Anthracyclines ^b	33 (86.8)	31 (83.8)
Cumulative dose of anthracyclines, mean (SD), mg/m ²	265.9 (76.4)	251.7 (44.9)
Thoracic radiotherapy	24 (63.2)	24 (64.9)
Radiotherapy dose, mean (SD), Gy	46.7 (6.3)	44.3 (7.4)
Surgery	26 (68.4)	26 (70.3)
Adjuvant hormonal therapy		
Any	22 (57.9)	21 (56.8)
Tamoxifen	6 (15.8)	12 (32.4)
Tamoxifen plus goserelin	3 (7.9)	3 (8.1)
Exemestane plus goserelin	1 (2.6)	0
Letrozole	12 (31.6)	6 (16.2)
Trastuzumab	5 (13.2)	2 (5.4)
Pertuzumab	3 (7.9)	1 (2.7)

Table 1. Baseline Characteristics of Participants (continued)

Characteristic	Patients ^a	
	CBCR (n = 38)	CBET (n = 37)
Cardiovascular risk factors		
Diabetes	1 (2.6)	2 (5.4)
Hypertension	15 (39.5)	13 (35.1)
Dyslipidemia	19 (50.0)	20 (54.0)
Smoking habits	4 (10.5)	5 (13.5)
Depression	12 (31.6)	9 (24.3)
Overweight	18 (47.3)	14 (37.8)
Obesity	12 (31.6)	10 (27.0)
Other comorbidities		
Ischemic heart disease	3 (7.9)	4 (10.8)
Atrial fibrillation	0	1 (2.7)
Heart failure	4 (10.5)	4 (10.8)
Valvular disease	1 (2.6)	0
Implantable cardioverter-defibrillator	1 (2.6)	1 (2.7)
Respiratory diseases ^c	6 (15.8)	5 (13.5)
Musculoskeletal disease ^d	7 (18.4)	7 (18.9)
Other ^e	5 (13.2)	4 (10.8)
Left ventricular ejection fraction, mean (SD)	55.6 (12.4)	55.6 (8.6)
Medication		
Anticoagulants	0	1 (2.7)
Antiplatelet therapy	2 (5.3)	3 (8.1)
β-Blockers	5 (13.2)	5 (13.5)
Anxiolytics	11 (28.9)	10 (27.0)
Antidepressants	12 (31.6)	9 (24.3)
Diuretics	7 (18.4)	7 (18.9)
Statins	16 (42.1)	14 (37.8)
Nitrates	0	1 (2.7)
Fibrates	2 (5.3)	2 (5.4)
ACEI	5 (13.2)	6 (16.2)
ARA II	4 (10.5)	6 (16.2)
Sacubitril or valsartan	2 (5.3)	0
Calcium channel blockers	4 (10.5)	1 (2.7)
Insulin	0	1 (2.7)
Antidiabetic agents ^f	1 (2.6)	2 (5.4)

Abbreviations: ACEI, angiotensin-converting enzyme inhibitor; ARA II, angiotensin II receptor antagonists; CBCR, center-based cardiac rehabilitation; CBET, community-based exercise treatment.

^a Data are presented as the number (percentage) of patients unless otherwise indicated.

^b Anthracyclines and radiotherapy were given sequentially.

^c Asthma and chronic obstructive pulmonary disease.

^d Degenerative joint disease.

^e Thyroid diseases, hepatitis, HIV infection, obstructive sleep apnea, chronic kidney disease, peripheral arterial disease, vertiginous syndrome.

^f Excluding insulin.

group (mean [SD] increase, 0.1 [1.4] points) ($P < .001$), with a mean between-group difference of 2.6 points (95% CI, 1.9-3.3

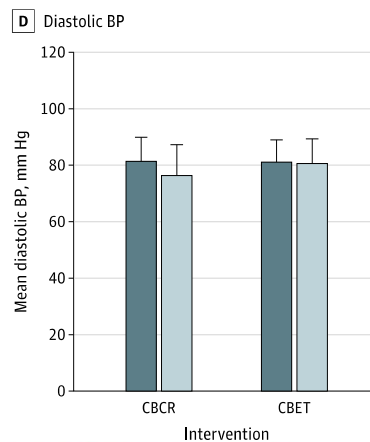
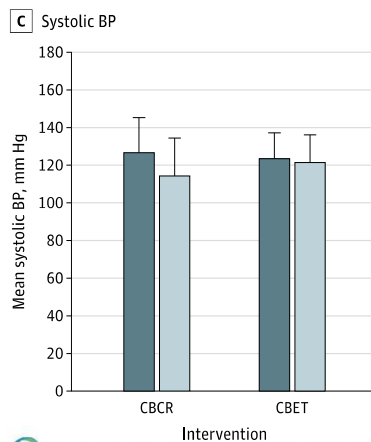
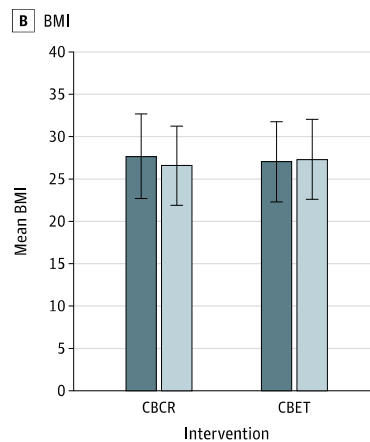
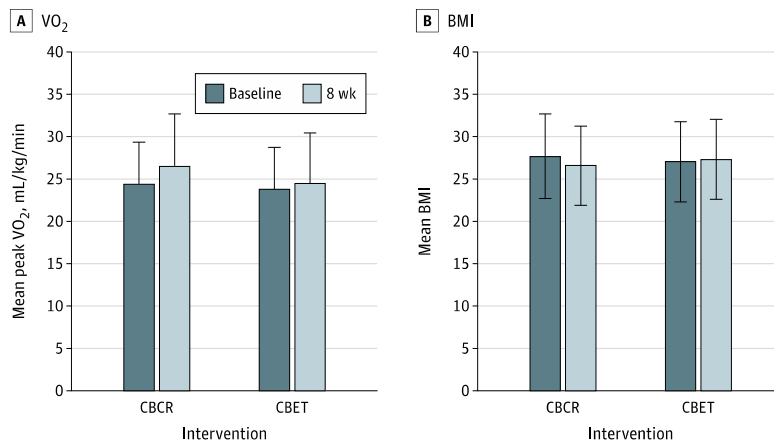
Figure 2. Changes From Baseline to the End of Intervention

Compliance 90% OCR (CBCR)

Vs 68%

Sans raison valable

0,8% (CBCR) Vs 14%



Viamonte S et al. JAMA Cardiology 2023



Table 3. Blood Pressure, Heart Rate, Physical Activity, Lipid Profile, Inflammation Markers, Psychological Symptoms, Health Literacy, and Health-Related Quality-of-Life Changes After the 8-Week Intervention

Metric	CBCR (n = 38)				CBET (n = 37)				Between-group difference	
	Mean (SD)		Change from baseline	P value	Mean (SD)		Change from baseline	P value		
	Baseline	Postintervention			Baseline	Postintervention				
Resting SBP, mm Hg	127.1 (18.9)	114.8 (13.8)	-12.3 (11.8)	<.001	123.9 (20.2)	122.0 (14.7)	-1.9 (12.9)	.39	-10.4 (-16.1 to -4.7)	<.001
Resting DBP, mm Hg	81.5 (8.4)	76.5 (7.8)	-5.0 (5.7)	<.001	81.4 (11.0)	80.9 (8.7)	-0.5 (7.0)	.70	-4.5 (-7.5 to -1.6)	.003
Resting heart rate, bpm	81.2 (13.6)	75.3 (11.3)	-5.9 (6.5)	<.001	82.0 (13.3)	83.7 (12.3)	1.7 (8.2)	.22	-7.6 (-11.0 to -4.2)	<.001
Total cholesterol level, mg/dL	182.1 (36.9)	167.1 (26.3)	-15.0 (27.8)	.002	178.1 (33.1)	186.7 (33.4)	8.6 (32.6)	.12	-23.6 (-37.6 to -9.7)	.001
Triglyceride levels, mg/dL	125.2 (60.0)	93.0 (32.6)	-32.3 (40.4)	<.001	152.0 (105.6)	154.9 (113.9)	2.9 (68.0)	.80	-35.2 (-60.8 to -9.5)	.008
HDL cholesterol level, mg/dL	53.3 (12.9)	54.3 (10.5)	1.0 (7.4)	.41	53.2 (13.3)	52.6 (14.2)	-0.6 (7.5)	.60	1.6 (-1.8 to 5.1)	.34
LDL cholesterol level, mg/dL	107.0 (32.3)	92.8 (24.5)	-14.2 (29.4)	.005	101.0 (32.3)	105.1 (28.6)	4.2 (21.6)	.25	-18.3 (-30.2 to -6.5)	.003
IL-6 level, pg/mL	5.2 (6.2)	4.8 (5.7)	-0.5 (2.0)	.19	3.6 (5.1)	5.1 (5.5)	1.5 (5.5)	.15	-2.0 (-4.0 to 0.1)	.06
HSCRP level, mg/dL	0.35 (0.39)	0.26 (0.29)	-0.08 (0.39)	.18	0.29 (0.46)	0.41 (0.72)	0.12 (0.66)	.35	-0.2 (-0.5 to 0.1)	.12
Physical activity, METs/min/wk	349.6 (530.6)	1384.7 (893.9)	1035.2 (735.7)	<.001	519.7 (467.9)	553.8 (608.1)	34.1 (424.4)	.63	1001.1 (719.8 to 1282.8)	<.001
HADS score										
Anxiety	7.9 (4.6)	5.3 (3.9)	-2.6 (2.7)	<.001	8.2 (4.3)	7.4 (4.2)	-0.8 (2.3)	.03	-1.8 (-2.9 to -0.6)	.003
Depression	6.0 (4.4)	3.3 (3.2)	-2.7 (3.0)	<.001	6.3 (4.0)	5.8 (3.7)	-0.5 (2.2)	.21	-2.2 (-3.7 to -0.6)	.009
EQ-5D-5L health state score	68.3 (15.2)	82.3 (9.5)	14.0 (10.0)	<.001	70.3 (15.7)	70.7 (16.1)	0.4 (12.9)	.85	13.6 (8.3 to 18.9)	<.001
Health literacy score ^a	1.6 (1.8)	4.3 (1.2)	2.7 (1.6)	<.001	1.7 (2.0)	1.8 (2.1)	0.1 (1.4)	.81	2.6 (1.9 to 3.3)	<.001

Abbreviations: CBCR, center-based cardiac rehabilitation; CBET, community-based exercise treatment; DBP, diastolic blood pressure; EQ-5D-5L, European Quality of Life 5 Dimensions questionnaire; HADS, Hospital Anxiety and Depression Score; HDL, high-density lipoprotein; HSCRP, high-sensitivity C-reactive protein; IL-6, interleukin 6; LDL, low-density lipoprotein; MET,

metabolic equivalents; SBP, systolic blood pressure.

SI conversion factors: To convert HDL, LDL, and total cholesterol to mmol/L, multiply by 0.0259 and triglycerides to mmol/L, by 0.0113.

^a Assessed by the Newest Vital Sign instrument.



Table 2. Body Composition, Handgrip Strength, and Physical Function Changes After the 8-Week Intervention

Metric	CBCR (n = 38)				CBET (n = 37)				Between-group difference	
	Mean (SD)		Change from baseline	P value	Mean (SD)		Change from baseline	P value		
	Baseline	Postintervention			Baseline	Postintervention			Mean (95% CI)	P value
Peak $\dot{V}O_2$, mL/kg/min	24.4 (7.0)	26.5 (7.5)	2.1 (2.8)	<.001	23.8 (6.2)	24.5 (6.0)	0.8 (2.5)	.07	1.3 (0.1 to 2.6)	.03
Exercise test duration, s	583.4 (141.6)	689.3 (142.9)	105.8 (64.0)	<.001	574.0 (175.5)	621.2 (156.6)	47.3 (64.2)	<.001	58.6 (28.9 to 88.3)	<.001
Weight, kg	75.0 (14.0)	72.1 (13.1)	-2.9 (2.6)	<.001	74.1 (14.8)	74.4 (14.6)	0.3 (1.6)	.22	-3.2 (-4.2 to -2.2)	<.001
BMI	27.7 (5.0)	26.6 (4.7)	-1.2 (0.9)	<.001	27.1 (4.7)	27.3 (4.7)	0.2 (0.7)	.10	-1.4 (-1.7 to -1.0)	<.001
Lean mass, kg	25.6 (4.0)	28.4 (5.5)	2.8 (2.5)	<.001	25.6 (5.4)	25.6 (5.5)	-0.1 (1.2)	.74	2.9 (2.0 to 3.8)	<.001
Fat mass, kg	27.8 (11.5)	25.0 (10.8)	-2.9 (2.3)	<.001	26.9 (10.5)	27.3 (10.7)	0.4 (2.3)	.24	-3.3 (-4.4 to -2.3)	<.001
Waist circumference, cm	99.2 (10.2)	94.4 (9.8)	-4.8 (3.3)	<.001	97.4 (11.2)	96.7 (11.4)	-0.7 (2.9)	.18	-4.1 (-5.6 to -2.7)	<.001
Hip circumference, cm	106.8 (12.1)	102.5 (10.8)	-4.3 (3.3)	<.001	103.8 (10.0)	103.9 (9.6)	0.1 (2.9)	.87	-4.4 (-5.8 to -3.0)	<.001
IHG, kgf										
Dominant hand	34.5 (7.2)	37.2 (7.2)	2.7 (2.4)	<.001	33.7 (9.7)	35.3 (8.5)	1.6 (3.4)	.01	1.0 (-0.3 to 2.4)	.13
Nondominant hand	31.6 (6.7)	33.7 (7.0)	2.1 (2.4)	<.001	31.6 (9.3)	33.3 (8.4)	1.6 (3.6)	.01	0.5 (-1.0 to 1.9)	.52
Sit-to-stand test, repetitions in 60 s, No.	32.0 (9.9)	42.7 (12.5)	10.7 (8.6)	<.001	30.9 (9.7)	32.9 (10.6)	2.0 (5.1)	.02	8.7 (5.5 to 12.0)	<.001

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); CBCR, center-based cardiac rehabilitation; CBET,

community-based exercise treatment; IHG, isometric handgrip strength; kgf, kilogram-force; $\dot{V}O_2$, oxygen consumption.



Etude rétrospective

39775 patientes diagnostiquées entre 2006 et 2011

Cancer du sein

*Korean National Health Insurance Service
database.*

*Suivi à partir de 5 ans après le diagnostic de cancer
du sein*

*Suivi durant 5 ans ou après évènement cv ou le
décès*

Activité minime, modérée, intense

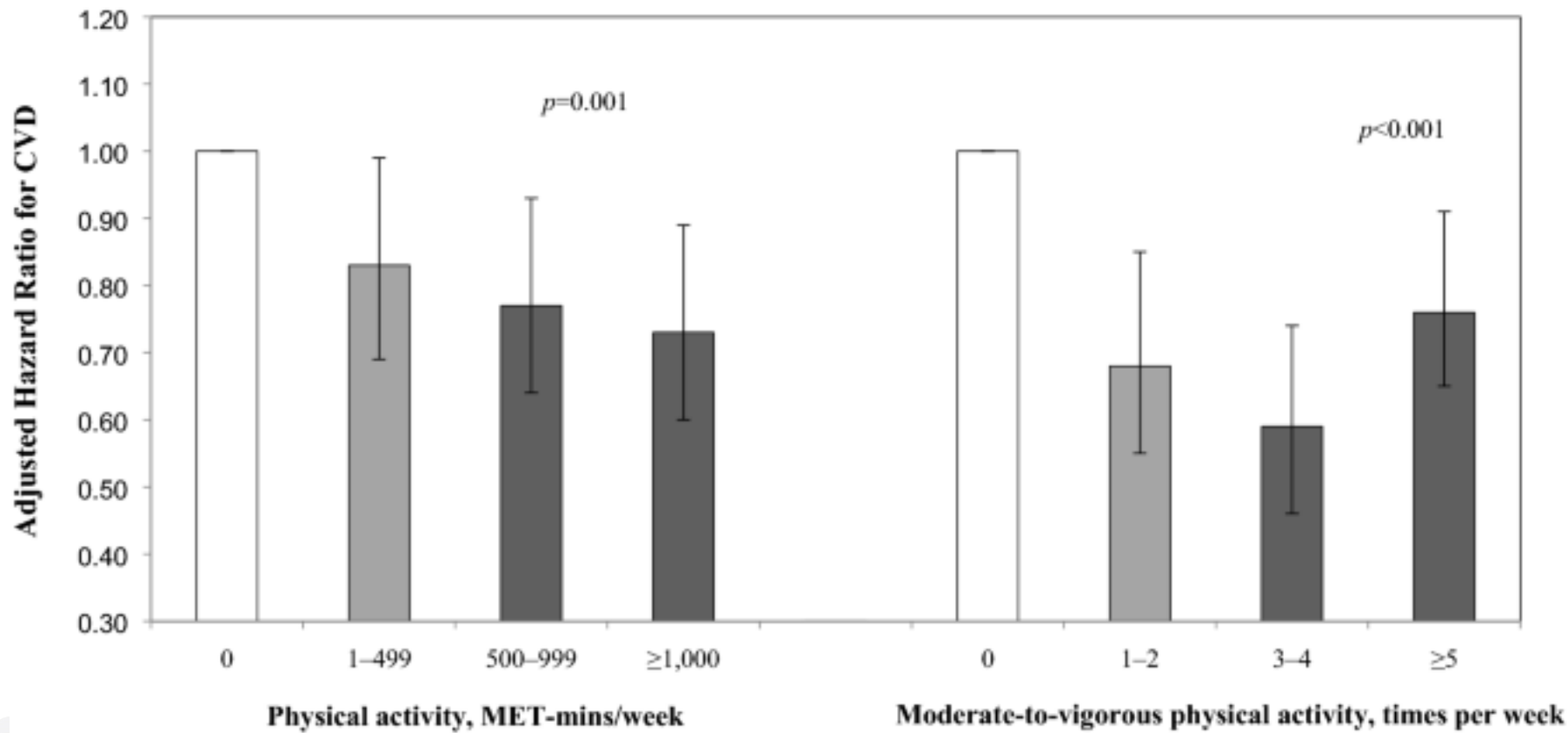
Association between physical activity and subsequent cardiovascular disease among 5-year breast cancer survivors. Kim KH. and al. Breast Cancer Res Treat. 2021 Jul;188(1):203-214.



FORUM EUROPÉEN CŒUR, EXERCICE & PRÉVENTION



Hazard ratios for cardiovascular disease according to physical activity for 5-year breast cancer survivors



Association between physical activity and subsequent cardiovascular disease among 5-year breast cancer survivors. Kim KH. and al. *Breast Cancer Res Treat.* 2021 Jul;188(1):203-214.



Table 4 Sensitivity analysis on the association of physical activity with cardiovascular disease risk among 5-year breast cancer survivors with healthy lifestyle behaviors or no cardiotoxic cancer treatment

Variables	Adjusted hazard ratio (95% CI) according to Physical activity, MET-min/week ^a				<i>P</i> _{trend}
	0	1–499	500–999	≥ 1,000	
Total participants	1.00 (reference)	0.83 (0.69–0.99)	0.77 (0.64–0.93)	0.73 (0.60–0.89)	0.001
Lifestyle behaviors					
Never smokers	1.00 (reference)	0.82 (0.69–0.99)	0.78 (0.65–0.94)	0.70 (0.57–0.85)	<0.001
Non-drinkers	1.00 (reference)	0.82 (0.68–0.98)	0.77 (0.63–0.93)	0.78 (0.64–0.96)	0.011
Cancer treatment					
No cardiotoxic chemotherapy	1.00 (reference)	0.78 (0.63–0.97)	0.81 (0.65–1.00)	0.71 (0.56–0.91)	0.009
No tamoxifen	1.00 (reference)	0.82 (0.68–0.98)	0.77 (0.63–0.92)	0.74 (0.61–0.91)	0.002
No aromatase inhibitor	1.00 (reference)	0.82 (0.68–0.99)	0.76 (0.63–0.92)	0.75 (0.61–0.92)	0.003
No radiotherapy	1.00 (reference)	0.79 (0.63–1.00)	0.82 (0.64–1.03)	0.73 (0.56–0.95)	0.025

^aThe 500 MET-min/week correspond to 152, 125, and 62.5 min per week of light-, moderate-, and vigorous-intensity physical activity, respectively

Adjusted hazard ratios calculated by Cox proportional hazards regression after adjustments for age, household income, smoking, alcohol intake, body mass index, systolic blood pressure, fasting serum glucose, total cholesterol, cardiotoxic chemotherapy, tamoxifen, aromatase inhibitor, radiotherapy, Charlson comorbidity index, and diagnosis year

MET metabolic equivalent of task



Etude rétrospective

Pays-Bas

559 patientes ayant présenté un cancer du sein entre 5 et 12 ans

Questionnaire d'AP sur les douze derniers mois

Inactive, AP minime, modérée, intense.

	Time Spent in Sports and Cycling (h/wk)			
	None	≤3.5	>3.5 to ≤7.0	>7.0
Sedentary	Inactive	Moderately inactive	Moderately active	Active
Standing	Moderately inactive	Moderately active	Active	Active
Manual	Moderately inactive	Active	Active	Active
Heavy manual	Active	Active	Active	Active
Unknown/missing	Inactive	Moderately inactive	Moderately active	Active

Table 1: Calculation of the Cambridge Physical Activity Index: A Cross-Tabulation of Occupational Activities With Recreational Activities

Physical Activity and Cardiac Function in Long-Term Breast Cancer Survivors: A Cross-Sectional Study. Naaktgeboren WR.and al. JACC CardioOnc.2022 Jun, 4 (2) 183-191



	Inactive (n = 28)	Moderately Inactive (n = 127)	Moderately Active (n = 154)	Active (n = 250)	Total (N = 559)
Age at diagnosis, y	46.8 (44.5-48.7)	46.4 (43.7-49.5)	46.3 (43.3-49.6)	47.1 (44.0-49.4)	46.9 (43.8-49.5)
Age at inclusion, y	55.2 (51.9-57.0)	56.0 (53.4-59.2)	55.1 (52.2-57.6)	55.4 (53.0-58.6)	55.5 (52.7-58.5)
Follow-up time, y	7.4 (6.9-11.1)	10.4 (6.8-11.6)	10.4 (6.9-11.6)	10.1 (6.7-11.6)	10.2 (6.8-11.6)
5-7 y	19 (67.9)	58 (45.7)	76 (49.4)	121 (48.4)	274 (49.0)
10-12 y	9 (32.1)	69 (54.3)	78 (50.6)	129 (51.6)	285 (51.0)
Cardiovascular risk factors ^a					
Hypertension	15 (53.6)	45 (35.4)	57 (37.5)	93 (37.2)	210 (37.7)
Hypercholesterolemia	9 (32.1)	43 (33.9)	45 (29.2)	79 (31.6)	176 (31.5)
Diabetes mellitus	4 (14.3)	8 (6.3)	9 (5.8)	17 (6.8)	38 (6.8)
Smoking					
Never	12 (42.9)	47 (37.0)	65 (42.2)	99 (39.6)	223 (39.9)
Former	10 (35.7)	55 (43.3)	65 (42.2)	123 (49.2)	253 (45.3)
Current	6 (21.4)	24 (18.9)	23 (14.9)	28 (11.2)	81 (14.5)
Unknown	0	1 (0.8)	1 (0.6)	0	2 (0.4)
Body mass index, kg/m ²	29.3 ± 6.0	26.2 ± 4.8	25.3 ± 4.1	25.7 ± 4	25.9 ± 4.4
Anthracyclines	15 (53.6)	66 (52.0)	88 (57.1)	137 (54.8)	306 (54.7)
Cumulative doxorubicin equivalent dose, ^b mg/m ²	202.5 (191-243)	240.0 (203-242)	240.0 (203-300)	240.0 (203-300)	240.0 (203-293)
Radiotherapy field					
Left sided	15 (53.6)	52 (40.9)	57 (37.0)	114 (45.6)	238 (42.6)
Right sided	9 (32.1)	61 (48.0)	79 (51.3)	107 (42.8)	256 (45.8)
IMNs	3 (10.7)	9 (7.1)	7 (4.5)	18 (7.2)	37 (6.6)
None	1 (3.6)	5 (3.9)	11 (7.1)	11 (4.4)	28 (5.0)
Trastuzumab	2 (7.1)	12 (9.4)	16 (10.4)	19 (7.6)	49 (8.8)

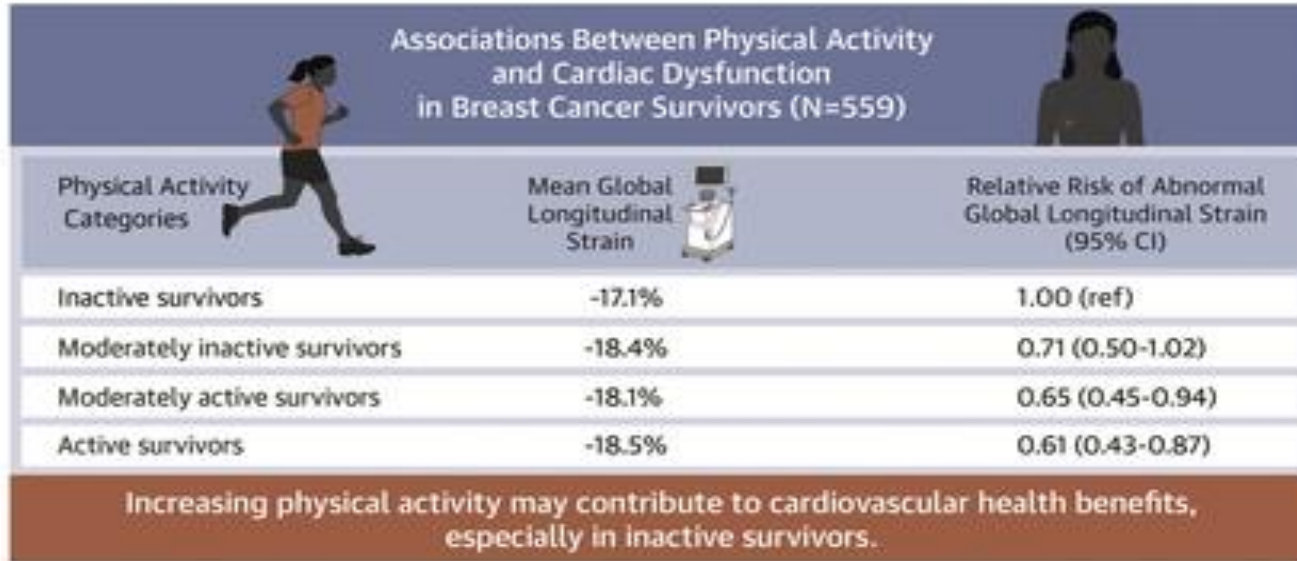
Table 2 Characteristics of Participants According to Cambridge Physical Activity Index Category
Values are median (Q1-Q3), n (%), or mean ± SD.



	Inactive (n = 28)	Moderately Inactive (n = 127)	Moderately Active (n = 154)	Active (n = 250)
GLS (%)^a				
Mean GLS (%)	17.1 ± 2.31	18.4 ± 3.40	18.2 ± 2.55	18.5 ± 3.14
Unadjusted $\hat{\beta}$ (95% CI)	Ref	$\hat{\beta} \sim 1.31$ (2.59 to 0.02) ^b	1.12 (2.39 to 0.15)	1.47 (2.70 to 0.24) ^b
Partially adjusted $\hat{\beta}$ (95% CI) ^c	Ref	1.14 (2.43 to 0.15)	0.87 (2.16 to 0.42)	$\hat{\beta} \sim 1.29$ (2.54 to 0.05) ^b
Fully adjusted $\hat{\beta}$ (95% CI) ^d	Ref	1.12 (2.41 to 0.17)	$\hat{\beta} \sim 0.92$ ($\hat{\beta} \sim 2.21$ to 0.38)	1.31 (2.55 to 0.06) ^b
Abnormal GLS (>-18%)^a				
At risk	17/26 (65.4)	54/115 (47.0)	57/130 (43.8)	87/214 (40.7)
Unadjusted RR (95% CI)	Ref	0.72 (0.51-1.01)	0.67 (0.48-0.94) ^b	0.62 (0.45-0.86) ^b
Partially adjusted RR (95% CI) ^c	Ref	0.72 (0.50-1.03)	0.68 (0.47-0.98) ^b	0.61 (0.43-0.88) ^b
Fully adjusted RR (95% CI) ^d	Ref	0.71 (0.50-1.02)	0.65 (0.45-0.94) ^b	0.61 (0.43-0.87) ^b
LVEF (%)				
Mean LVEF (%)	58.7 $\hat{A} \pm 4.61$	59.2 $\hat{A} \pm 3.97$	58.9 $\hat{A} \pm 4.48$	59.1 $\hat{A} \pm 5.00$
Unadjusted $\hat{\beta}^2$ (95% CI)	Ref	0.49 (1.40 to 2.38)	0.25 (1.61 to 2.11)	0.40 (1.40 to 2.21)
Partially adjusted $\hat{\beta}^2$ (95% CI) ^c	Ref	0.37 (1.55 to 2.28)	0.28 (1.62 to 2.18)	0.39 (1.44 to 2.23)
Fully adjusted $\hat{\beta}^2$ (95% CI) ^d	Ref	0.27 (1.64 to 2.18)	0.20 (1.70 to 2.09)	0.35 (1.48 to 2.18)
LVEF (<53%)				
At risk	1/27 (3.6)	5/127 (3.9)	10/163 (6.5)	18/249 (7.2)

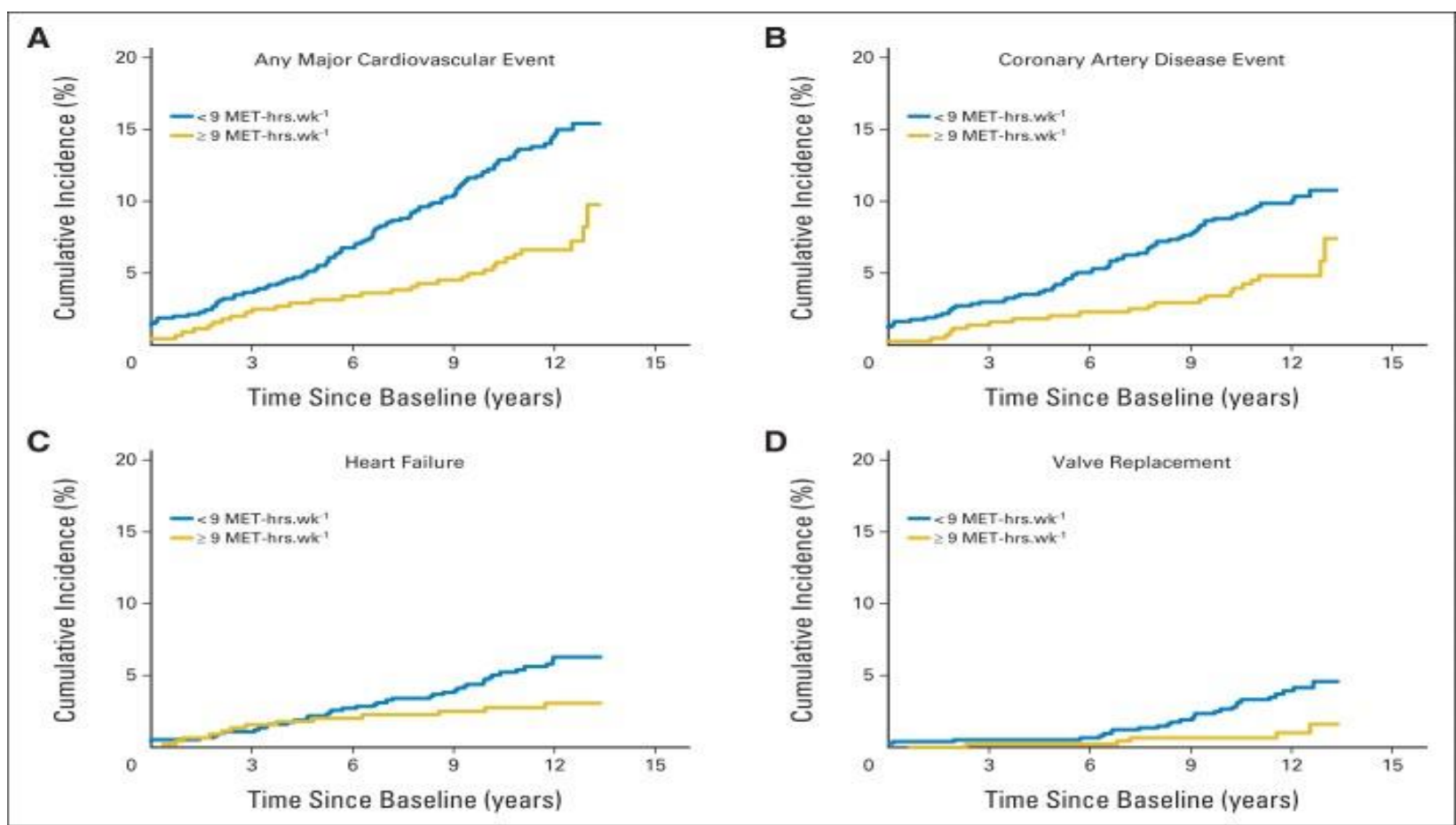


CENTRAL ILLUSTRATION: Physical Activity and Cardiac Function in Long-Term Breast Cancer Survivors



Naaktgeboren WR, et al. J Am Coll Cardiol CardioOnc. 2022;4(2):183-191.

Chez les survivantes du cancer du sein à long terme des niveaux d'activité physique plus élevés ont été associés à une amélioration GLS mais pas FEVG.



Exercise and Risk of Major Cardiovascular Events in Adult Survivors of Childhood Hodgkin Lymphoma: A Report From the Childhood Cancer Survivor Study. Jones L. and al. J Clin Oncol. 2014 Nov 10;32(32):3643-50.

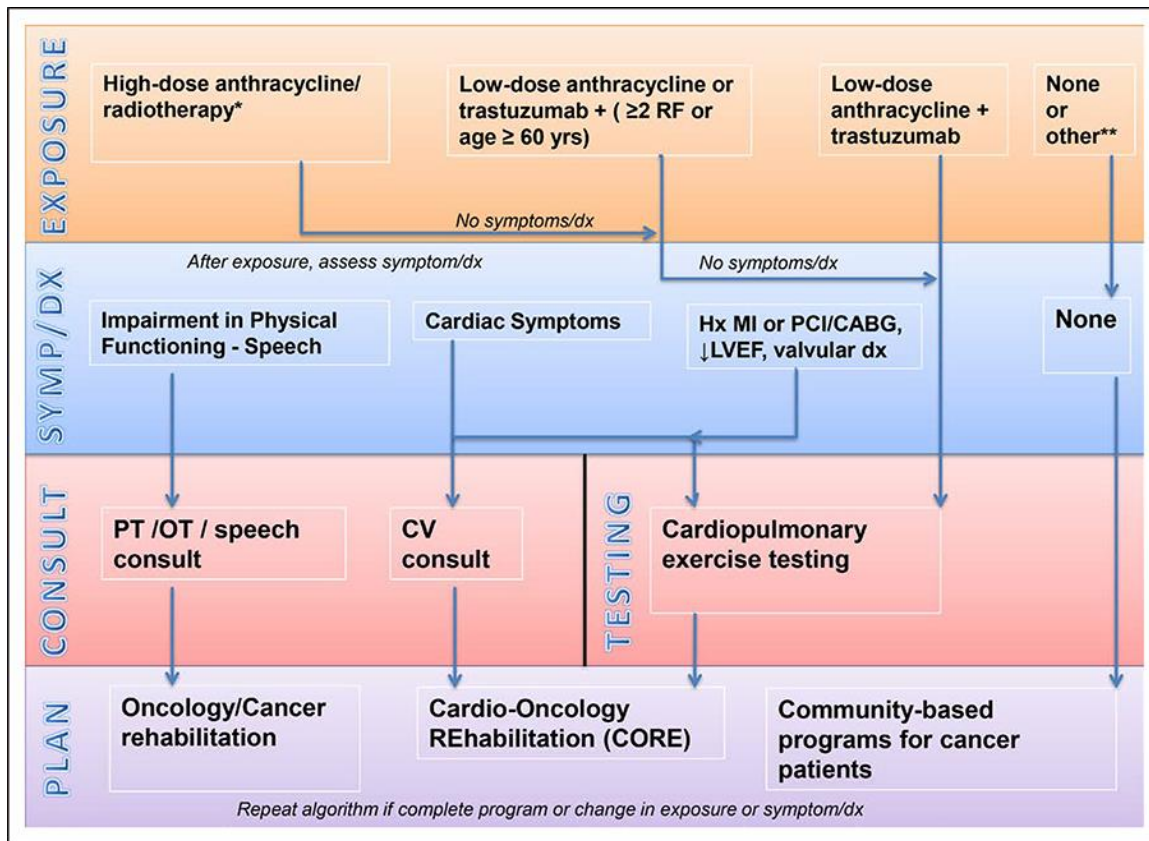


AHA SCIENTIFIC STATEMENT

Cardio-Oncology Rehabilitation to Manage Cardiovascular Outcomes in Cancer Patients and Survivors: A Scientific Statement From the American Heart Association

Susan C. Gilchrist, MD, MS, Chair, Ana Barac, MD, PhD, Vice Chair, Philip A. Ades, MD, Catherine M. Alfano, PhD, Barry A. Franklin, PhD, FAHA, Lee W. Jones, PhD, Andre La Gerche, MBBS, PhD, Jennifer A. Ligibel, MD, Gabriel Lopez, MD, Kushal Madan, PhD, FAHA, Kevin C. Oeffinger, MD, Jeannine Salamone, BA, Jessica M. Scott, PhD, Ray W. Squires, PhD, FAHA, Randal J. Thomas, MD, MS, FAHA, Diane J. Treat-Jacobson, PhD, RN, FAHA, Janet S. Wright, MD, and On behalf of the American Heart Association Exercise, Cardiac Rehabilitation, and Secondary Prevention Committee of the Council on Clinical Cardiology; Council on Cardiovascular and Stroke Nursing; and Council on Peripheral Vascular Disease





None or other:

- maladie cardiovasculaire
- antécédents médicaux
- expositions à un traitement antérieur
- **survivants de cancers pédiatriques**
- sur la base d'expositions antérieures à haut risque.

AHA recommande d'effectuer un CPET lors de la visite initiale d'évaluation du patient dans le cadre d'un programme CORE

Susan C. Gilchrist. *Circulation. Cardio-Oncology Rehabilitation to Manage Cardiovascular Outcomes in Cancer Patients and Survivors: A Scientific Statement From the American Heart Association, Volume: 139, Issue: 21, Pages: e997-e1012*



Utilisation des EE dans le cancer

Evaluation objective de la capacité fonctionnelle

Aide à :

- orienter
- stratifier des risques
- surveiller les toxicités
- individualiser les prescriptions d'exercices
- évaluer l'efficacité des interventions

TABLE 1. Exemplar Performance Status Assessment Tools

Tool	Target Population	Assessment Description	Outcome Description	Objective	Dynamic	Widespread Feasibility
KPS ⁷	Pan-cancer	Evaluation of patient physical functioning related to activities of daily living	Linear score from 0 (dead) to 100 (well functioning)	No	Possible	Yes
ECOG ⁸	Pan-cancer	Evaluation of patient physical functioning related to activities of daily living	Linear score from 0 (fully active) to 5 (dead)	No	Possible	Yes
GA ³²	Age ≥ 65 years	Evaluation of multiple domains (eg, functional status, falls, comorbid conditions, cognitive status, psychological state, nutrition)	Linear or dichotomous scores, depending on domain	No	Possible	No
HCT-CI ³³	Patients undergoing HCT	Evaluation of 17 categories of comorbidities (eg, cardiac, pulmonary, psychiatric)	Weighted score from 0 (low risk) to 29 (high risk)	Yes	Possible	No
Sit-to-Stand ³⁵	Pan-cancer	Measurement of the No. of times sitting to full standing can be completed in 30 seconds	Linear metric from < 4 (poor) to approximately 20 (excellent)	Yes	Possible	No
TUG ³⁶	Pan-cancer	Measurement of time taken to rise from a chair, walk 3 meters, turn, walk back, and sit down	Linear metric from < 12 seconds (poor) to approximately 85 seconds (excellent)	Yes	Possible	No
SPPB ³⁷	Pan-cancer	Evaluation of multiple domains (eg, balance, sit to stand, walking speed)	Linear score in each domain from 0 (poor) to 4 (excellent)	Yes	Possible	No
6MWT ³¹	Pan-cancer	Measurement of distance covered during 6MWT in a 100-foot hallway	Linear metric from < 100 meters (poor) to approximately 700 meters (excellent)	Yes	Possible	No
Incremental exercise test/ CPET ³¹	Pan-cancer	Estimation or direct measurement of VO ₂ peak during an 8- to 12-minute exercise test on a bike or treadmill where the load or speed is progressively increased	Linear metric from < 15 mL O ₂ ·kg ⁻¹ ·min ⁻¹ (poor) to > 85 mL O ₂ ·kg ⁻¹ ·min ⁻¹ (endurance trained)	Yes	Possible	No
Digital phenotyping ⁷¹	Pan-cancer	Measurement of PRO, mobility, and/or physiologic data using digital devices	Metrics of mobility (eg, light, moderate, vigorous activity, minutes/day) and physiologic (eg, sleep duration, [minutes]; heart rate, [beats/minutes])	Yes	Yes	Possible

Abbreviations: 6MWT, 6-minute walk test; CPET, cardiopulmonary exercise test; ECOG, Eastern Cooperative Oncology Group; GA, Geriatric Assessment; HCT-CI, Hematopoietic Cell Transplantation–Specific Comorbidity Index; KPS, Karnofsky Performance Score; PRO, patient-reported outcome; SPPB, Short Physical Performance Battery; TUG, Timed-Up-and-Go test; VO₂peak, peak oxygen consumption.

Performance Status in Cancer: Not Broken, But Time for an Upgrade? Scott JM et al. Jclin Oncol 2020; 38(25) : 2824-2829.



Programme multimodal de CORE

Table 3. Safety Check for Exercise Training in CORE (Table view)

Normal testing
CPET ⁷¹
Resting BP \leq 160/90 mm Hg*
Normal BP response to exercise
No inducible ischemia
No atrial or ventricular arrhythmias
Maintain normal O ₂ saturations
No symptoms†
6-min walk test ⁷²
Resting blood pressure \leq 160/90 mm Hg*
Maintain normal O ₂ saturations
Laboratory studies
Absence of severe anemia (<8.0 g/dL)
Absolute neutrophil count >500 mm ³
Platelet count >50 000/ μ L
No baseline symptoms
Acute nausea during exercise
Vomiting within 24 h
Disorientation
Blurred vision
Ongoing cancer complications
Acute infection
Acute metabolic disease‡
New-onset lymphedema
Mental or physical impairment to exercise
Initial wound healing after surgery
Bone or brain metastasis§
Displays exercise knowledge
Understands functions of aerobic and resistance equipment
Demonstrates correct form on equipment
Understands perceived exertion and heart rate goals; performs exercise accordingly



Gilchrist SC. *Circulation. Cardio-Oncology Rehabilitation to Manage Cardiovascular Outcomes in Cancer Patients and Survivors: A Scientific Statement From the American Heart Association, Volume: 139, Issue: 21, Pages: e997-e1012*



Key Strategies for Cardiac Rehabilitation Services

- Well-trained multidisciplinary team
- Baseline patient assessment
- Evidence-based treatment plan
- Assessment of patient progress
- Adjustment of treatment plan as indicated
- Long-term follow-up plans

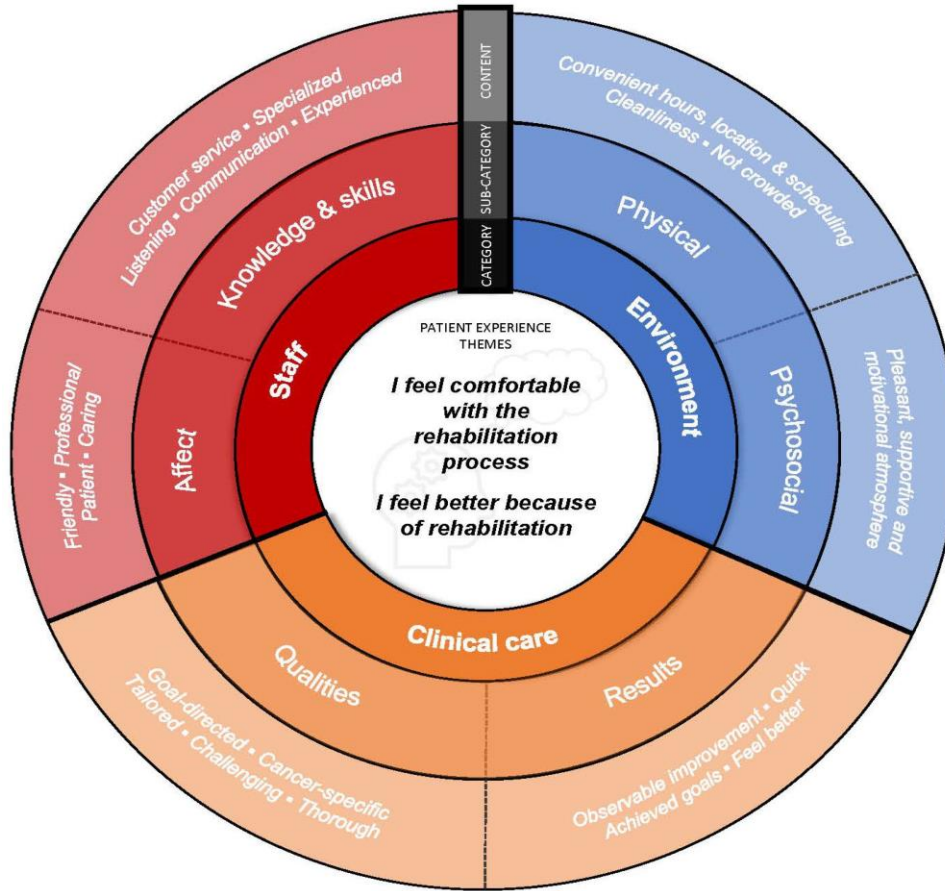


Key Adaptations for Home-based Cardiac Rehabilitation Activities

- Communication links with CR Team
 - Smartphone-based strategies
 - Wearable devices for reminders, tracking, reporting
- Treatment plan adjusted to home-setting
- Patient self-directed activities
 - Monitoring of adherence to treatment plan
 - Tracking progression in exercise and nutrition plans
 - Adjusting treatment plans with help of care team

Susan C. Gilchrist. Circulation. Cardio-Oncology Rehabilitation to Manage Cardiovascular Outcomes in Cancer Patients and Survivors: A Scientific Statement From the American Heart Association, Volume: 139, Issue: 21, Pages: e997-e1012





Understanding Patient Experience with Outpatient Cancer Rehabilitation Care. Wood KC. *Healthcare* 2023, 11(3), 348.



Cardiac Rehabilitation	Cardio-Oncology Rehabilitation
Exercise training	Same
Physical activity counseling	Same
Nutrition counseling	Same
Psychosocial management	Same
Weight management	Same
Coronary Risk Factor management: hypertension and dyslipidemia Diabetes Smoking cessation	Useful before mandatory after oncology therapy
Some of these issue also in advanced Heart Failure	Effects after oncology therapy: fatigue, surgical and radiation related impairment, pain syndromes, deconditioning/weakness/balance issues

Une relation sous-estimée!

Oncology and Cardiac Rehabilitation: An Underrated Relationship. Venturini E. and Al. J. Clin. Med. 2020, 9(6), 1810.



BRIEF AND CASE REPORTS

Cardio-Oncology Rehabilitation (CORE) Exercise Prescription and Programming

A PRACTICAL GUIDE

Shultz, Adam M. MS; Squires, Ray W. PhD; Shin, John Y. MD; Durani, Urshila MD; Pophali, Priyanka A. MD

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Journal of Cardiopulmonary Rehabilitation and Prevention 41(5):p 341-344, September 2021. | DOI: 10.1097/HCR.0000000000000572



FORUM EUROPÉEN CŒUR, EXERCICE & PRÉVENTION



*Cadre et justification partenariat
entre cardiologues de RC et oncologues
Programme de RC
En ambulatoire
Multidisciplinaire
AP supervisée, contrôle des FDRCV*

*Mayo Clinic depuis 2017
aucun délai d'attente après le cancer
pt pec durant le TTT
Centre de RC de référence
Ambulatoire (proche du centre)
5 semaines à 3 mois jsq 5 seances par semaine
Télé-réhabilitation
Suivi telephonique 6 mois*

**Cardio-Oncology Rehabilitation (CORE) Exercise Prescription and Programming A
PRACTICAL GUIDE. Shultz et al. 2021**



Table 1

Types of Cancer and Number of Patients With Each Diagnostic Category for Participants in CORE^a

Cancer Type	Patients (n = 109)
Breast	18 (16)
Colon	1 (1)
Endometrial	1 (1)
Esophageal	2 (2)
Hypopharyngeal	1 (1)
Lung	1 (1)
Lymphoma	68 (62)
Lymphoma/leukemia/myelodysplastic myeloproliferative overlap	1 (1)
Lymphoma/prostate	1 (1)
Myelodysplastic syndrome	1 (1)
Myeloma	2 (2)
Prostate	2 (2)
Rectal	1 (1)
Renal	2 (2)
Sarcoma	4 (4)
Thyroid	3 (3)

Abbreviation: CORE, cardio-oncology rehabilitation.

^aData presented as n (%).

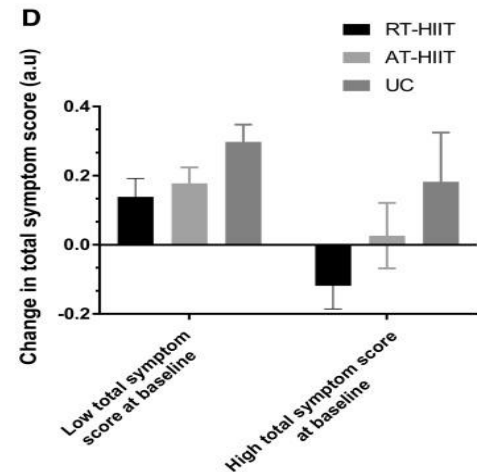
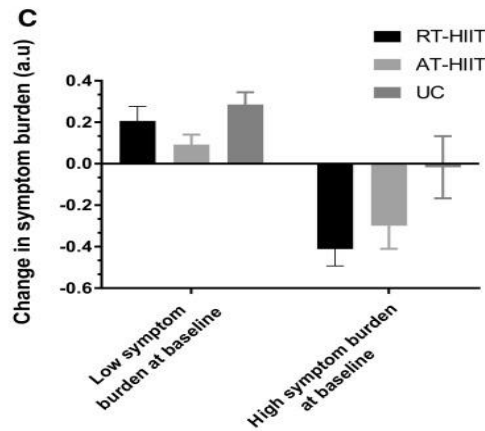
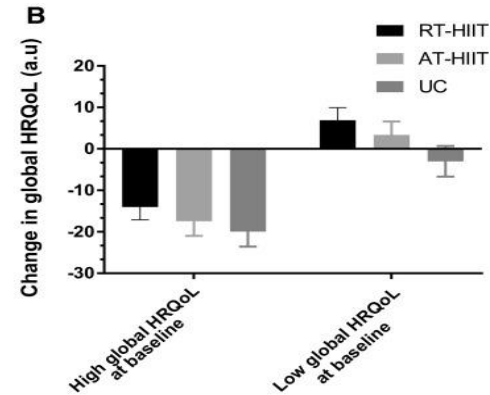
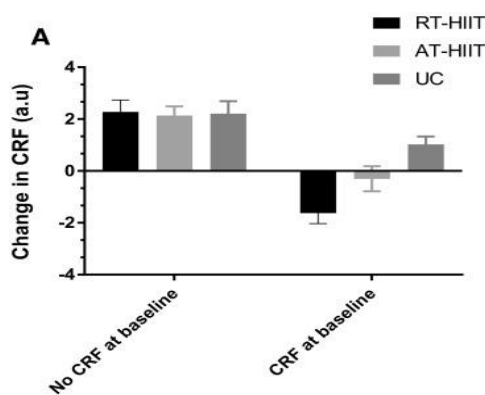
Table 2**Mayo Clinic Exercise Prescription Components for CORE**

FITT-P Components	Aerobic	Resistance	Flexibility/ROM
Frequency	<ul style="list-style-type: none"> • 3-5(+) d/wk • 5-7 d/wk preferred 	<ul style="list-style-type: none"> • 2-3(+) d/wk 	<ul style="list-style-type: none"> • Daily
Intensity	<ul style="list-style-type: none"> • Moderate to very hard • RPE 12-14/20 and/or 65-75% HR_{peak} or 40-60% of HRR for moderate-intensity training • RPE 15-17 and/or 85-95% HR_{peak} or 80-90% of HRR for high-intensity interval training 	<ul style="list-style-type: none"> • Initial RPE 12-14/20 and/or 60% of one-repetition maximum • To point of fatigue but not failure • No Valsalva maneuver • Use proper technique 	<ul style="list-style-type: none"> • To point of muscle tension, avoid pain
Time	<ul style="list-style-type: none"> • Begin with 5-20 min, as tolerated • Progress to 30-90(+) min/session or as tolerated 	<ul style="list-style-type: none"> • 1-3 sets • 8-15 slow, deliberate repetitions • 8-10(+) exercises 	<ul style="list-style-type: none"> • 15(+) sec/stretch
Type	<ul style="list-style-type: none"> • Large muscle group rhythmic activities: walking, jogging, recumbent stepper, cycling, elliptical, water-based exercise, etc 	<ul style="list-style-type: none"> • Body weight exercises • Resistance bands • Free weights • Resistance machines 	<ul style="list-style-type: none"> • Gentle dynamic ROM exercises and static stretches focusing on all major joints of the limbs, as tolerated per musculoskeletal morbidities • Address treatment-related deficiencies in ROM
Progression	<ul style="list-style-type: none"> • Add 1-5 min/session, or as tolerated • Utilize RPE scale and/or target HR to determine need for increase in workload 	<ul style="list-style-type: none"> • When 15 repetitions can be comfortably performed, increase resistance to next higher increment • Gradually progress as tolerated • If resistance does not allow for ≥ 8 repetitions, decrease load 	<ul style="list-style-type: none"> • Progress to full joint ROM, as tolerated • Consider adding floor-based stretches if mobility allows • Consult with physical medicine and rehabilitation specialists, as needed

Abbreviations: CORE, cardio-oncology rehabilitation; FITT-P, frequency, intensity, time, type, and progression of exercise; HR, heart rate; HR_{peak}, peak heart rate; HRR, heart rate reserve; ROM, range of motion; RPE, ratings of perceived exertion.



240 femmes
 BC I à III
 Durant la chimioTTT
 RT-HIIT
 AT-HIIT,
 deux fois par semaine
 pendant 16 semaines,
 ou le groupe UC
 l'entraînement physique débute 3 jours
 après la deuxième séance de chimiothérapie.



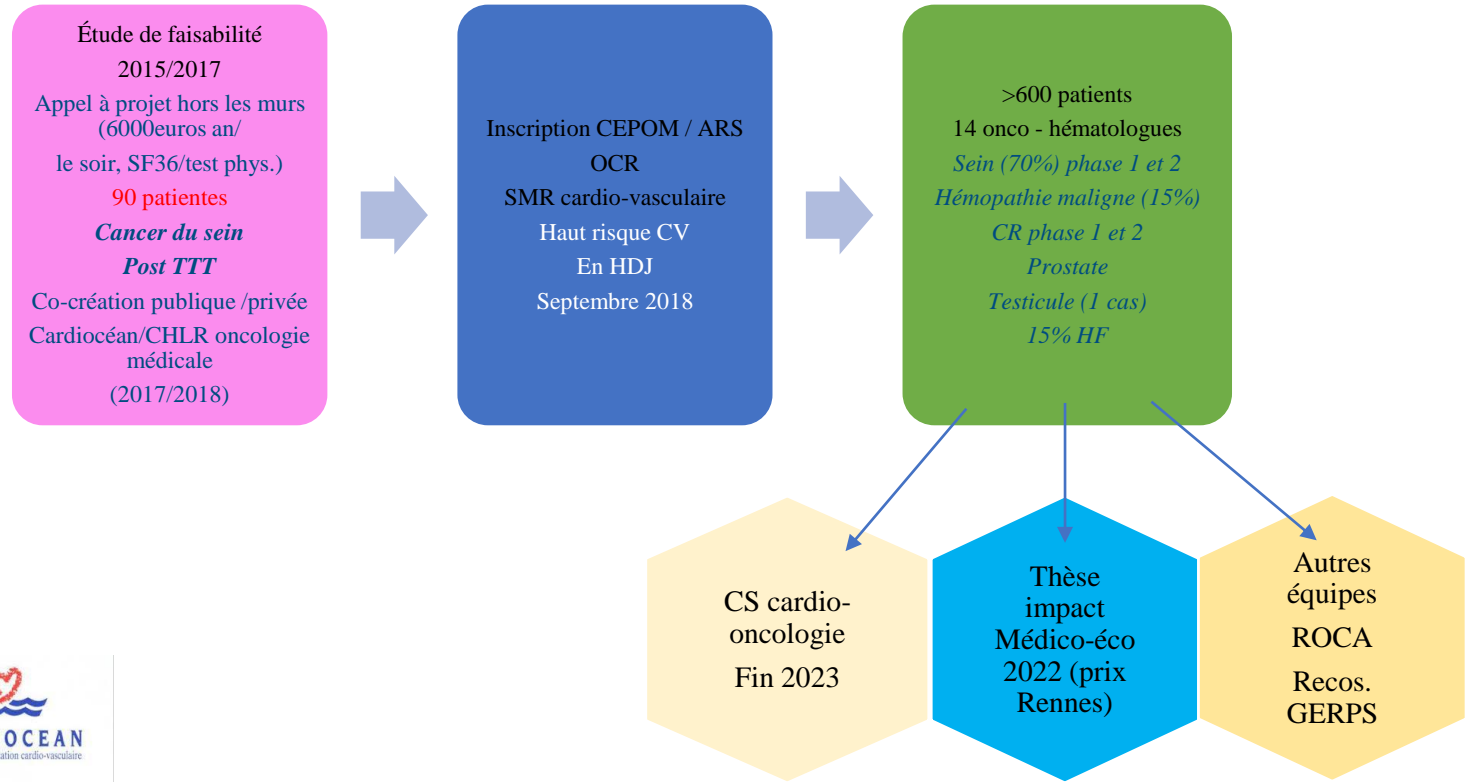
Adding high-intensity interval training to conventional training modalities: optimizing health-related outcomes during chemotherapy for breast cancer: the OptiTrain randomized controlled trial Mijwel S et al. Breast Cancer Research and Treatment (2018) 168:79–93



Comment on s'y
prend?



RetEx programme OCR rochelais de 2015 à ce jour...



OCR à Cardiocéan: déroulement du séjour

Pré-admission

- Adressage par oncologue /hématologue (MG/cardio...)
- Conseil: débiter avec un profil type de patients
- Fiche d'adressage
- Phase 1 / 2 (si phase 1, pas de venue durant 3/5j après cure de chimiothérapie)

Entrée

- Bilan cardiovasculaire: ETT (FEVG, **SLG**), ECG, CSE, **EE VO2** (<55ans)
- Dépistage vasculaire E.doppler TSA/IPS ou AMI, eval. lymphoedème
- **Questionnaire de qualité de vie SF36** (adapté à tout type de cancer)
- Diagnostic éducatif

Déroulement du séjour

- CSU, évaluation clinique, lymphoedème, holter ecg
- **Ateliers « ETP »** (éducation à la santé) + P.E.C **FDRCV**
- **Trois AP** par jour (2 aérobie (SV1/Borg)/résistance) + **danse thérapie 1/Semaine**
- Bilan diététique personnalisé, A. Sociale
- Groupes patients mixtes ETP/AP

OCR à Cardiocéan: déroulement du séjour



ETP

- **FDRCV**
- **Endurance**
- **Santé mentale : CS psy, relaxation, photolangage, danse thérapie**
- **Tabac**
- **Phase 3**
- **Suivi CV /CO**



Sortie

- **Bilan cardio-vasculaire de sortie: « ETT » EE VO2**
- **Consultation de sortie, bilan éducatif final, SF36 final**
- **Préparer la phase 3 et suivi CV**
- **Lettre de liaison aux médecins référents**



GUIDELINE AT-A-GLANCE RECOMMENDED INTERVENTIONS

Anxiety

During Active Treatment

- Mindfulness-based interventions
- Yoga
- Hypnosis
- Relaxation therapy
- Music therapy or music-based interventions
- Reflexology
- Lavender essential oil inhalation

Post-Treatment

- Mindfulness-based interventions
- Yoga
- Acupuncture
- Tai chi and/or qigong
- Reflexology

Depression

During Active Treatment

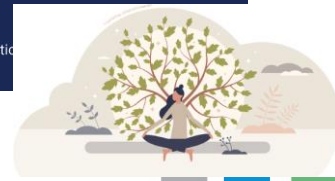
- Mindfulness-based interventions
- Yoga
- Relaxation therapy
- Music therapy or music-based interventions
- Reflexology

Post-Treatment

- Mindfulness-based interventions
- Yoga
- Tai chi and/or qigong

Carlson et al *J Clin Oncol* 2023
[ascopubs.org/survivorship-guidelines](https://ascopubs.org/journal/ascopubs/ascosurvivorship-guidelines)

Note. Evidence quality and strength of recommendations are available in the guideline publication.



PHASE 3: Club « cœur et cancer » depuis 2018



Équipe soignants Cardiocéan + oncologues (CA)
Association loi 1091
Prestataires diplômés
Appel à projet annuel ARS + mécénat

Aquagym
Stretching
RM
Endurance
Badminton

APA

Ateliers /trimestre
PNNS4, crétois,
Microbiote
Cours de cuisine en
immersion en ferme
bio (/an)

Diététique
(DE)

Art thérapie
Danse thérapie
(DIU)
Coaching mental
(oncologue/coach)
Chorale

Santé
Mentale

100aine adhérents



TAKE HOME MESSAGES

- **Cancer** en cardiologie = **l'affaire de tous !**
- FDRCV communs : Ne pas culpabiliser mais éduquer, sur le continuum de prise en charge du patient (A vie) !
- Préconiser **Activité physique**
 - **dès l'annonce diagnostique jusqu'en post-thérapeutique → A VIE**
 - *Aérobic + Résistance 3 à 4 fois par semaine, SVI*
- **Bénéfices CV et QDV si supervisé:**
 - **Améliore le pic de VO₂, diminue le déconditionnement, la toxicité cardiaque des traitements, les FDRCV, MCV, et la mortalité CV.**
 - A démontrer sur la FEVG et le SLG.
 - Penser EE + VO₂
- **OCR** en centre:
 - débiter par une filière, adressage petit groupe, phase 1 ou 2
 - → éducation plus facile: suivi CO + FDRCV
 - dépistage de cardiopathies précoces
 - équipe multidisciplinaire (dont binome de cardio/médecin non cardio)
- **Recommandations GERPS**
- Cœur de la femme !



Merci de votre attention



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