Functiebehoud en inspanningstraining bij oncologie-patiënten

Symposium
Kankercachexie en het belang van functiebehoud

Maastricht UMC+, Oncologiecentrum

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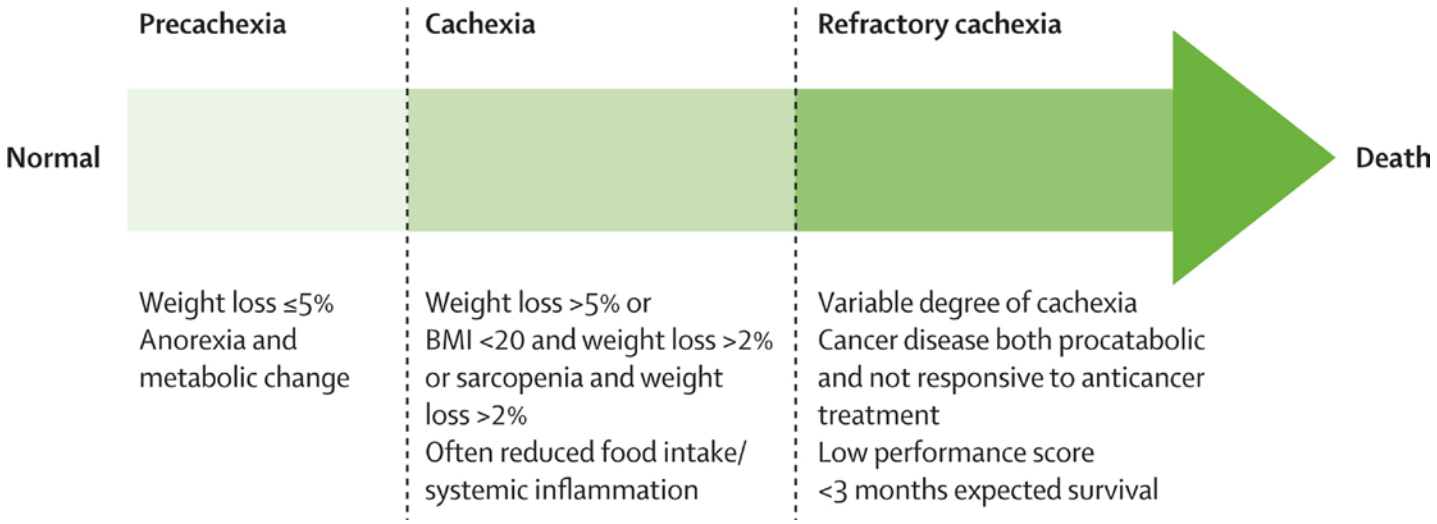
Disclosure belangen spreker

(potentiële) belangenverstrengeling	Geen
Voor bijeenkomst mogelijk relevante relaties met bedrijven	Bedrijfsnamen
• Sponsoring of onderzoeksgeld • Honorarium of andere (financiële) vergoeding • Aandeelhouder • Andere relatie, namelijk …	• • • •

Cachexia versus exercise training



Fearon K, Lancet Oncology 2011

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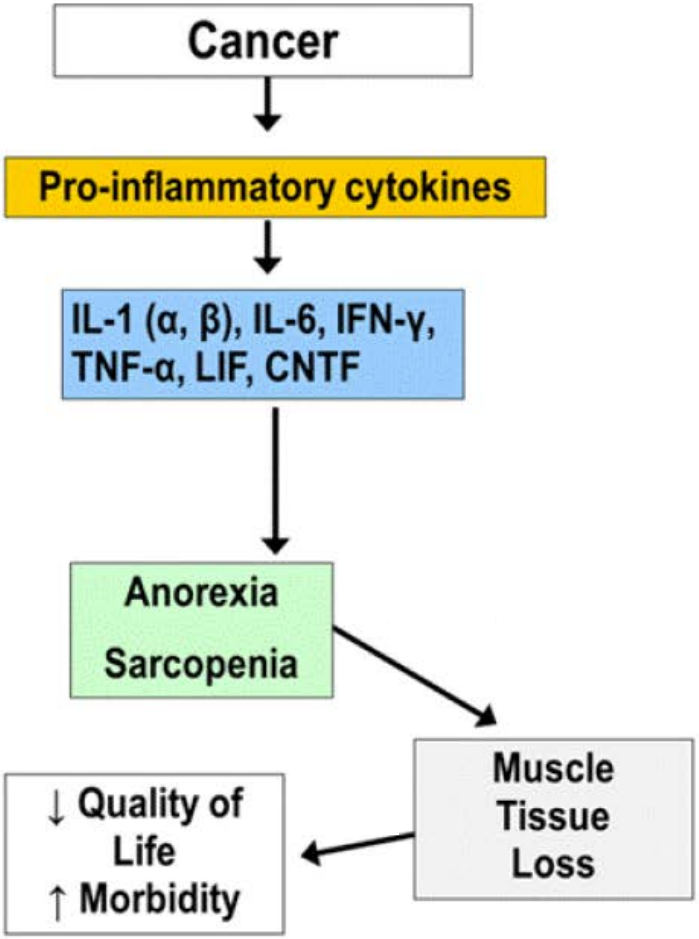
Cachexia versus exercise training: rationale



Exercise Anti-Cachectic Hypothetical Model – Battaglini CL, Cancers 2012

Cachexia versus exercise training: the evidence

Cochrane Library

Cochrane Database of Systematic Reviews

2014

Exercise for cancer cachexia in adults (Review)

Grande AJ, Silva V, Riera R, Medeiros A, Vitoriano SGP, Peccin MS, Maddocks M

- Randomized controlled trials
- Patients with cachexia according to the Fearon 2011 definition (>50%)
- Any form of exercise compared to usual care or no treatment
- Primary outcome: Lean body mass
- Secondary outcome: Muscle function, exercise capacity, fatigue, HRQoL

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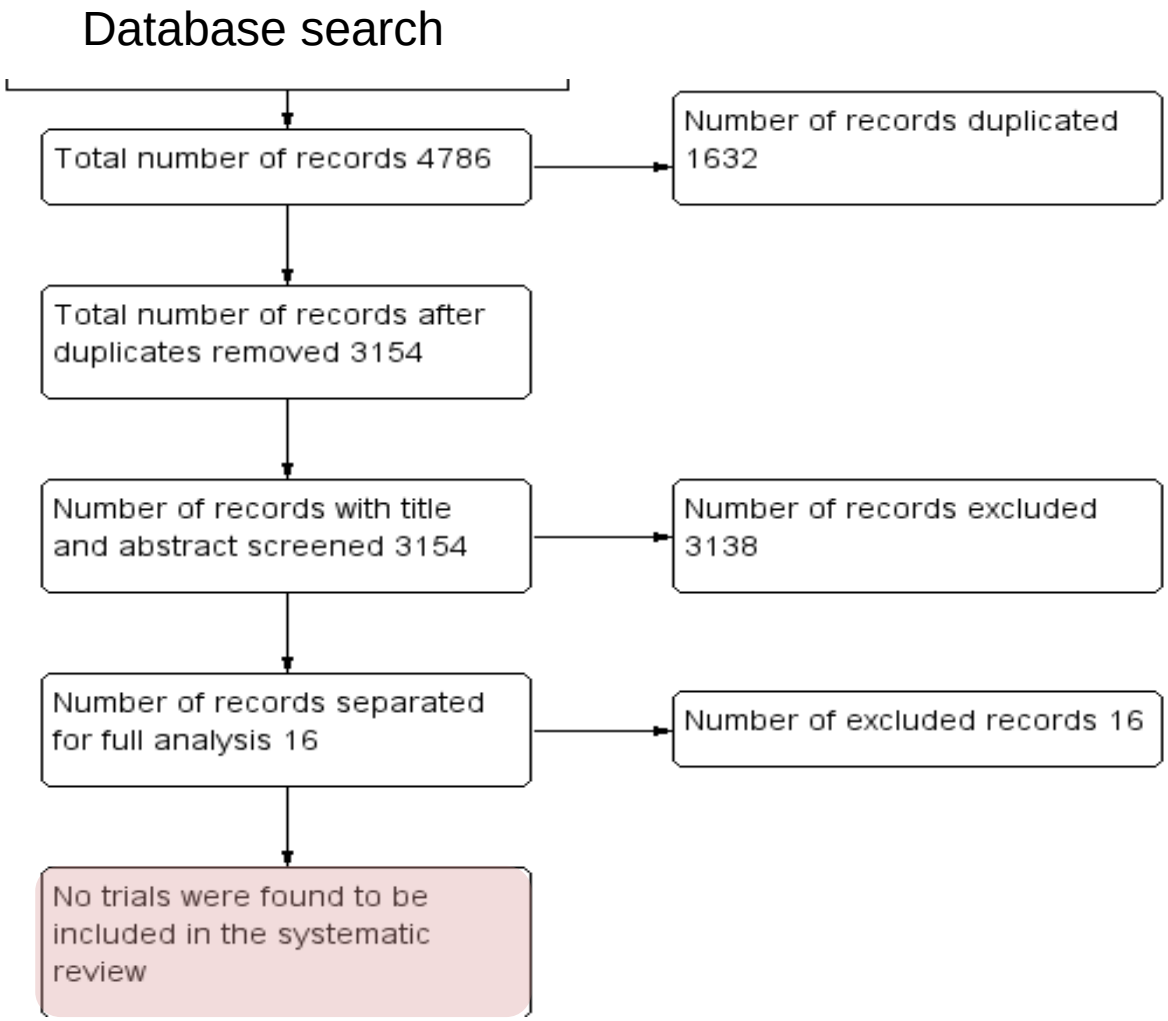
Cachexia versus exercise training: the evidence



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Muscle dysfunction in cancer patients

Age

Comorbidities

Supportive care medication

Malnutrition

Cancer therapy

Tumor-derived factors

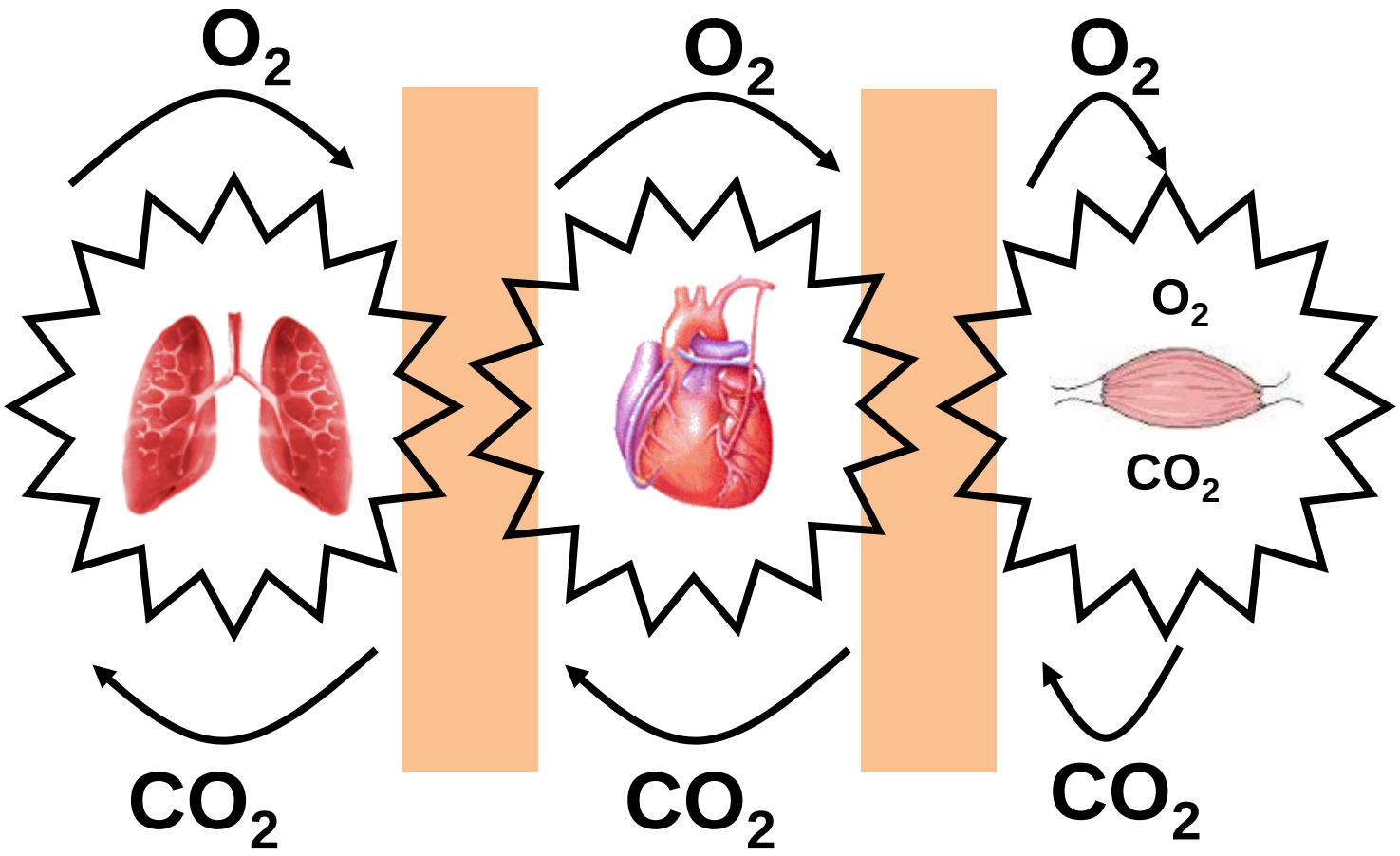
Low physical activity

Sedentary behaviour

Ventilation

Cardiac output and circulation

Muscle



Inspired by Thierry Troosters

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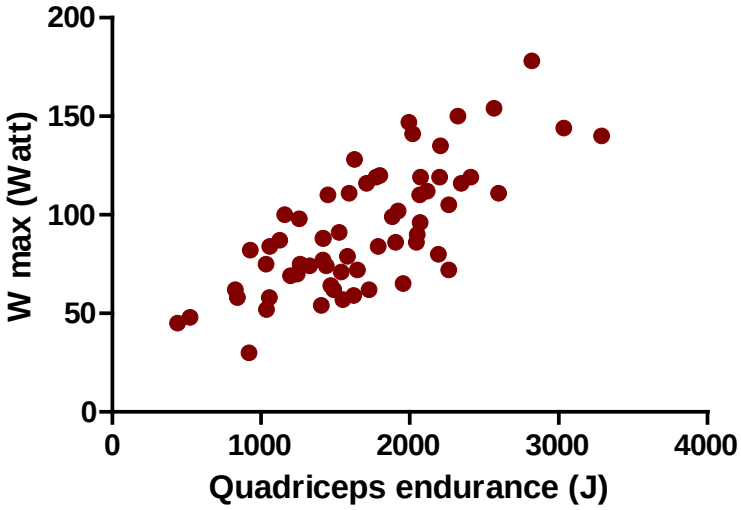
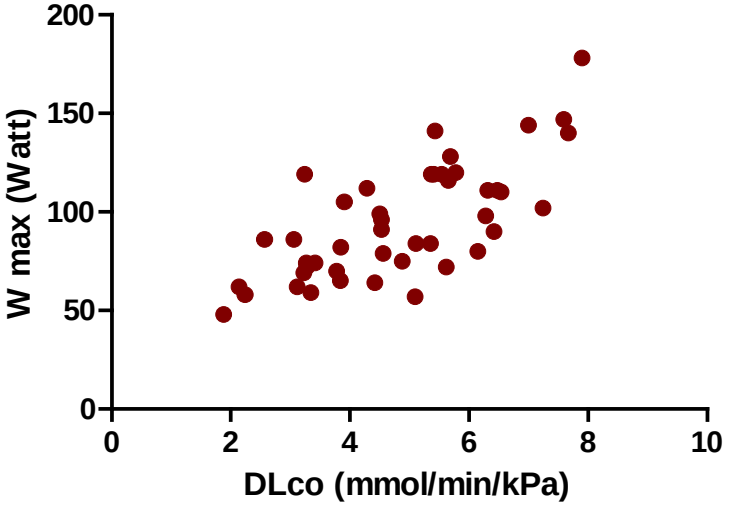
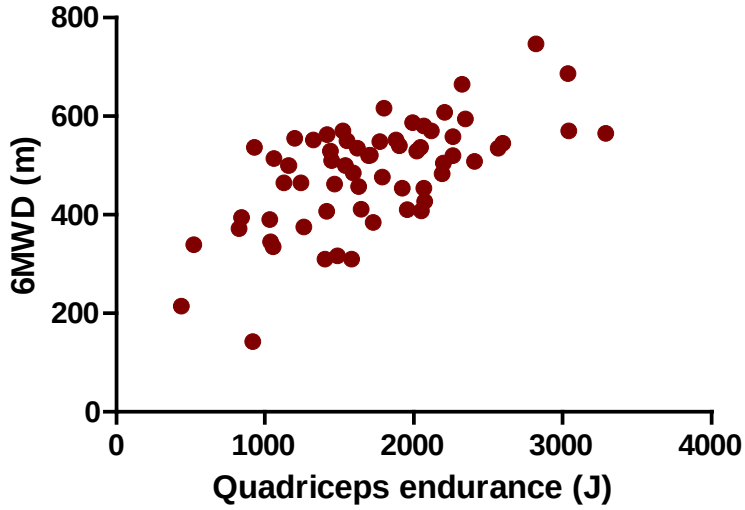
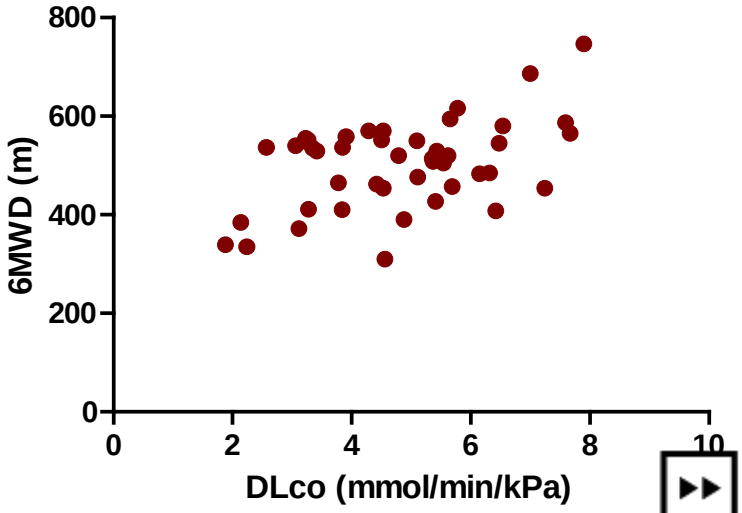
Exercise capacity after lung resection

N=64; assessment during first year after surgery









Burtin C, Respirology 2017

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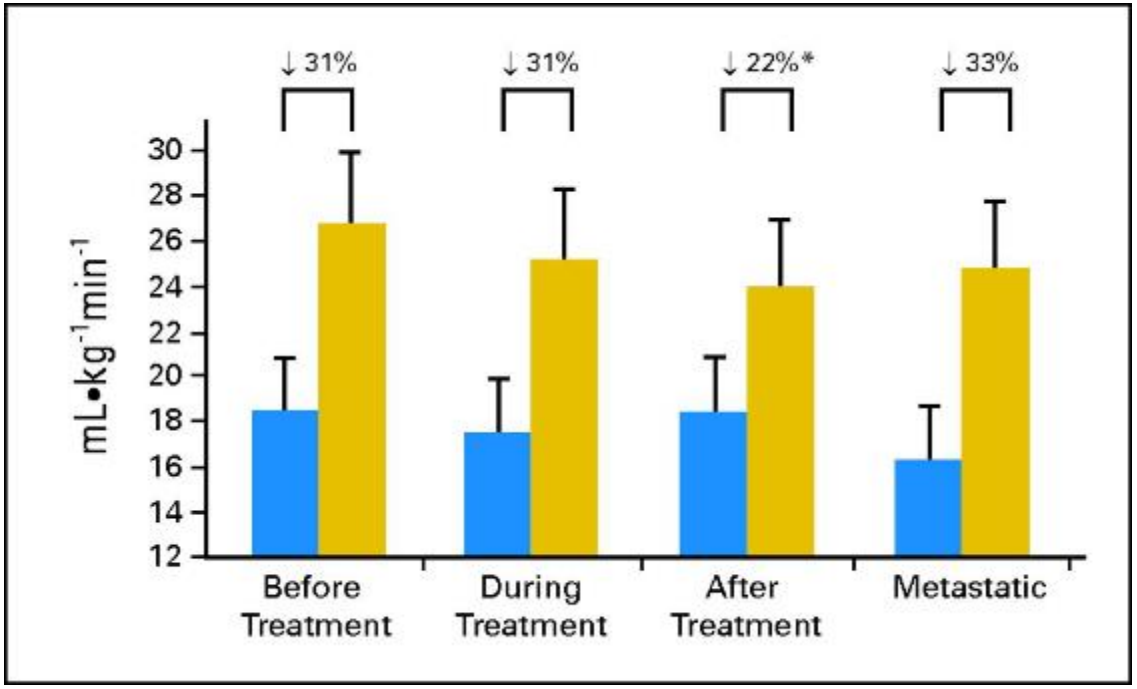
Exercise capacity after breast cancer



Findings not unique for breast cancer:

VO_2max decreases 30 to 50% after treatment in different cancer types

Cohort	40yrs	50yrs	60yrs	70yrs
Patients After Therapy (n=140)	21.05	19.51	17.97	16.44
Healthy controls (n=107)	29.82	26.32	22.82	19.32

Jones L, J Clin Oncol 2012

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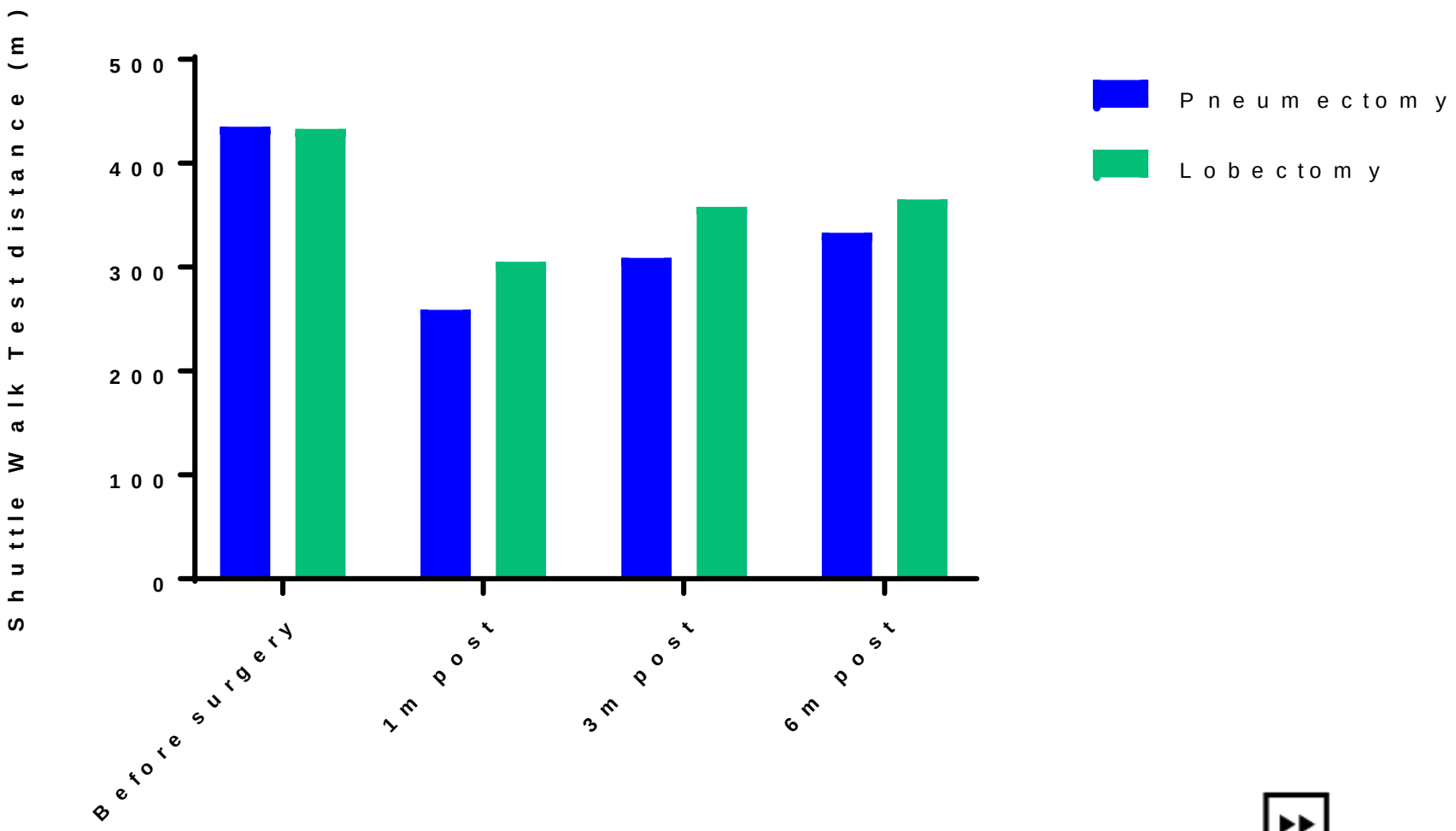
Exercise capacity after lung resection

n=88

HEALTHY SUBJECTS



Win T, Resp Care 2007

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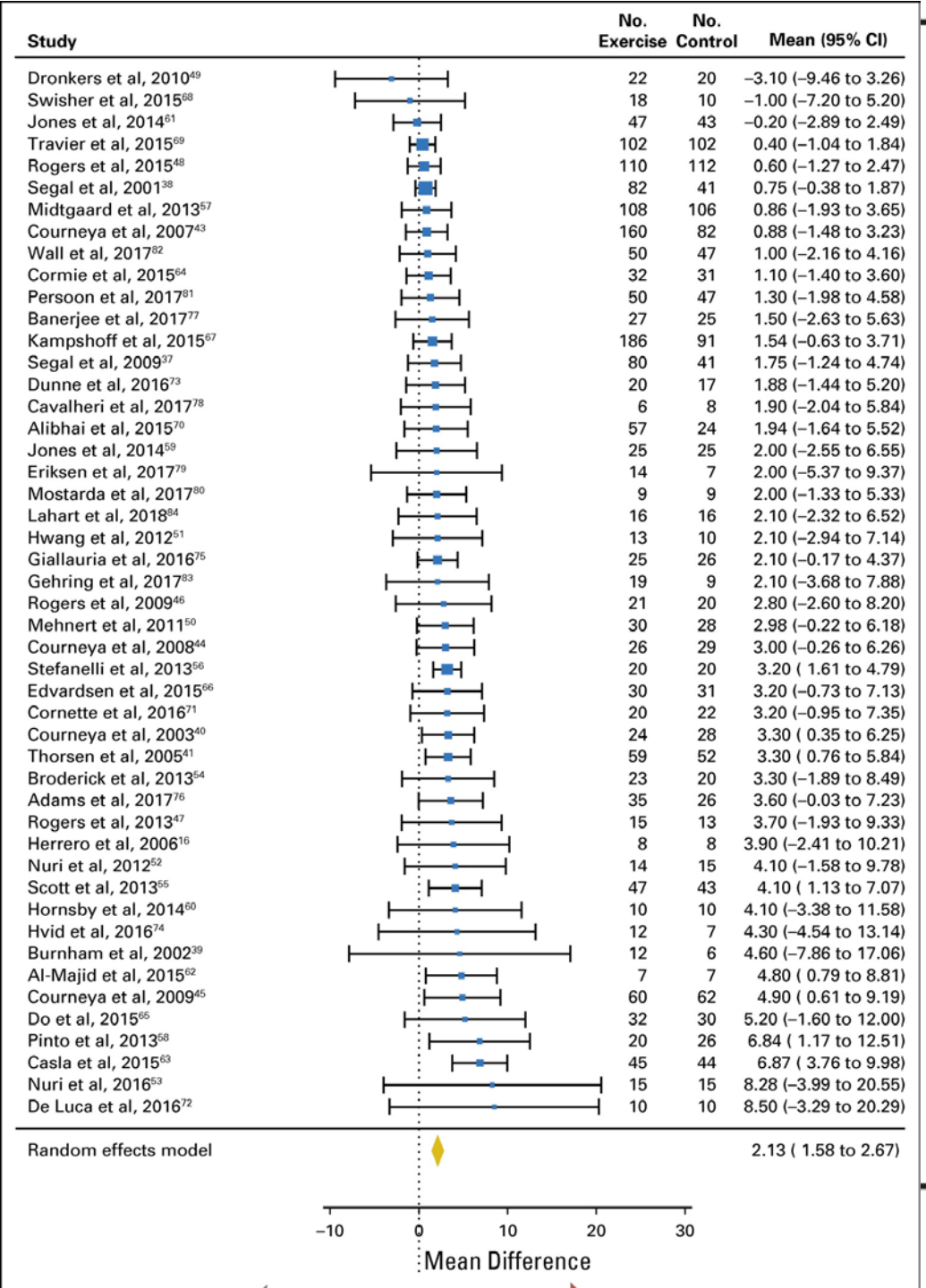

Effect on VO_2 max

Meta-analysis

48 RCT's – 3632 patients

- Timing of invervention
- Type of cancer
- Linear vs non-linear training
- Aerobe training vs Combined training
- Duration of training
- Supervised vs partly supervised
- Publication year

Did not influence magnitude of training effect

Scott JM, J Clin Oncology 2018

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The most complete overview of exercise effects

Therapeutic effects of aerobic and resistance exercises for cancer survivors: a systematic review of meta-analyses of clinical trials

Joel T Fuller,[1,2] Michael C Hartland,[2] Luke T Maloney,[2] Kade Davison[2]

- 140 independent meta-analyses
- 139/140 meta-analyses suggest a beneficial effect of exercise
- The beneficial effect was statistically significant in 104 (75%) of meta-analyses
- Quality of evidence was variable, with most studies rated low or moderate quality
- The majority of meta-analyses are entirely or mostly based on patients with breast cancer

Fuller JT, British Journal of Sports Med 2018

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The most complete overview of exercise effects

Therapeutic effects of aerobic and resistance exercises for cancer survivors: a systematic review of meta-analyses of clinical trials

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Primarily moderate effect sizes: cardiovascular fitness and muscle strength

Primarily small effect sizes: cancer-related fatigue, health-related quality of life and depression

Other beneficial effects based on individual trials: activity behaviour, balance, endothelial function, body composition, insulin resistance

Fuller JT, British Journal of Sports Med 2018

FITT recommendations for individuals with cancer

	Aerobic	Resistance	Flexibility
Frequency	3-5 d/wk	2-3 d/wk	≥2-3 d/wk with daily being most effective
Intensity	Moderate (40-59% VO2R; 64-75% Hrmax; RPE 12-13 to vigorous (60-89% VO2R; 76-95% Hrmax; RPE 14-17)	Start with low resistance (e.g. <30% 1-RM) and progress with smallest increments possible	Move through ROM as tolerated
Time	75 min/wk of vigorous intensity or 150 min/wk of moderate intensity or an equivalent combination of the two	At least 1 set of 8-12 repetitions	10-30s hold for static stretching
Type	Prolonged, rhythmic activities using large muscle groups (eg. Walking, cycling, swimming)	Free weights; resistance machines or weight-bearing functional tasks targeting all major muscle groups	Stretching or ROM exercises for all major muscle groups (! Radiation, surgery area)

ACSM's guidelines for exercise testing and prescription

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ACSM's guidelines for exercise testing and prescription

Risk assessment for exercise-induced adverse events

Low Risk:
- Early-stage cancer survivors
- High baseline level of physical activity
- No significant comorbidities

→ General recommendations[9] for physical activity for cancer survivors →

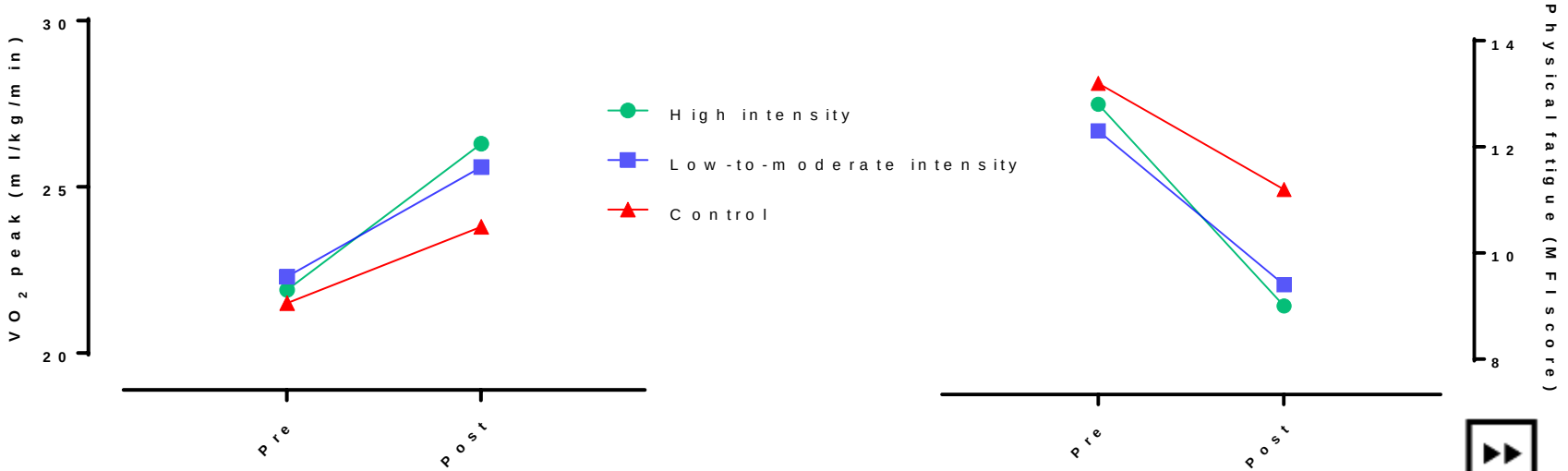
Implementation of physical activity recommendations (see SPA-4)

National Comprehensive Cancer Network Guidelines Survivorship: Healthy lifestyles 2014

Individualization of training: an example (high intensity training)

- RCT with 277 cancer survivors (2/3 breast cancer) that completed chemotherapy
- 12 weeks of exercise training – 2 sessions per week

	Resistance exercises (1-RM) [a]	Endurance interval exercises	Endurance interval exercises	Counseling
	(six exercises targeting the large muscle groups)	Part A (MSEC) [a] (8 min alternating workload)	Part B (HRR) [a] (3 × 5 min constant workload)	
HI exercise [b]	70–85 %	30/65 %	≥80 %	Participants were encouraged to start or maintain a physically active lifestyle in addition to the supervised exercise sessions
LMI exercise [b]	40–55 %	30/45 %	40–50 %	



Kampshoff CS, BMC Medicine 2015

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Individualization of training: an example (NMES)

- RCT with 49 patients receiving palliative treatment for lung cancer
- 30 minutes of quadriceps NMES; minimally 3 sessions per week

- Only 50% of patients reached the minimal adherence
- Adherence was enhanced by incorporating sessions into a daily routine and hindered by undesirable effects of chemotherapy
- There were no serious adverse events related to NMES
- There were no effects on quadriceps strength, thigh muscle mass and physical activity

Maddocks M, Plos One 2013

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