

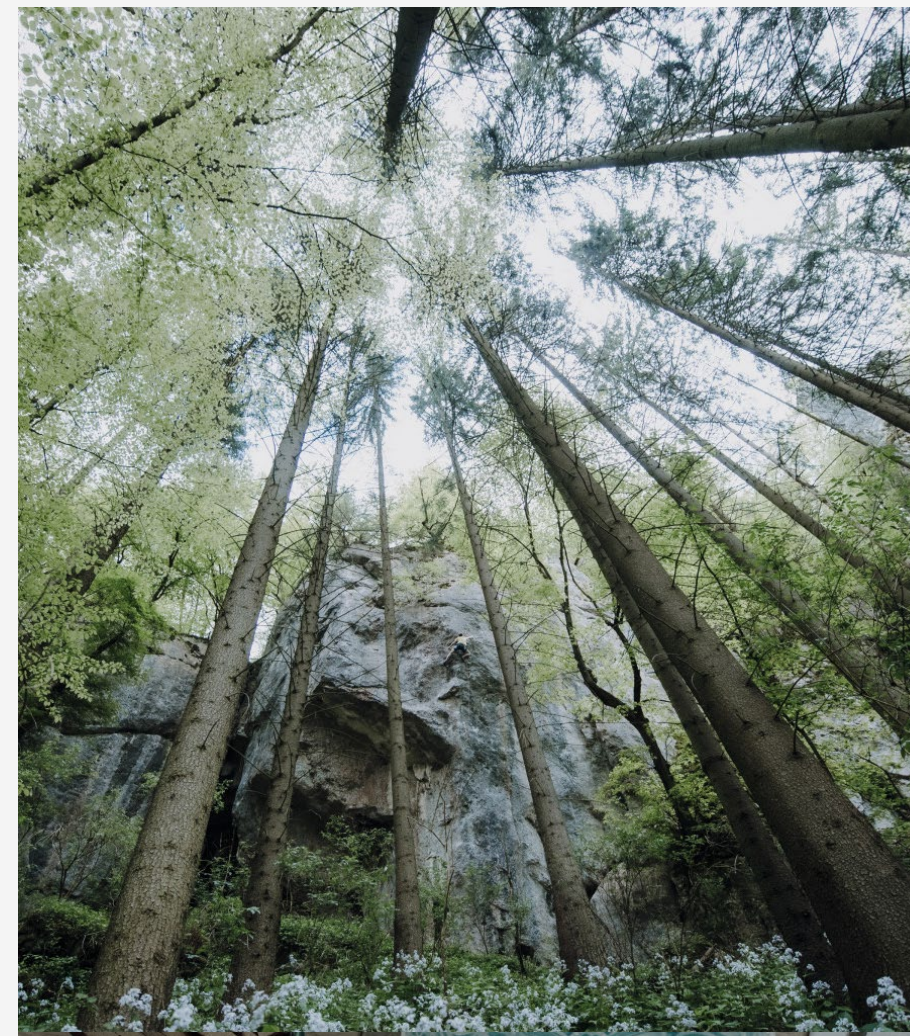
4 Key Pillars

Physical Activity & Outdoor Sport

Balanced Nutrition

Sustainability & Nature

Physical & Mental Wellbeing



IS SPORT A DRUG AND WHY DO WE NEED (MORE) SPORT?

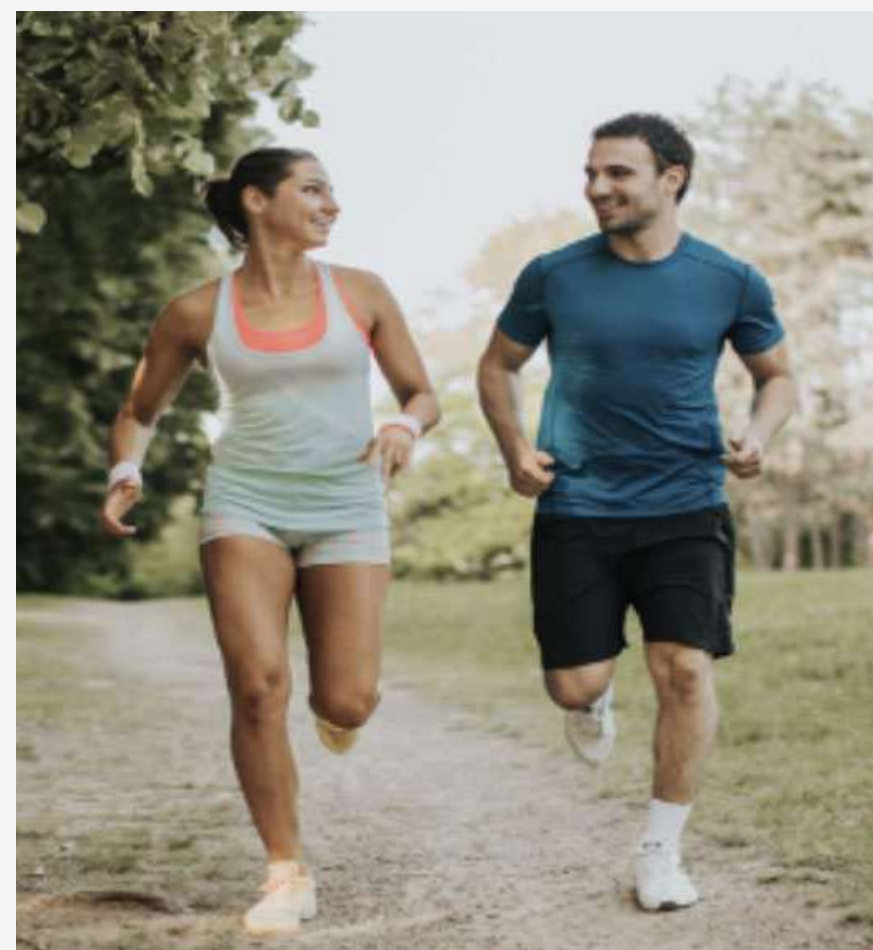
Physical Activity

Any movement increasing energy expenditure



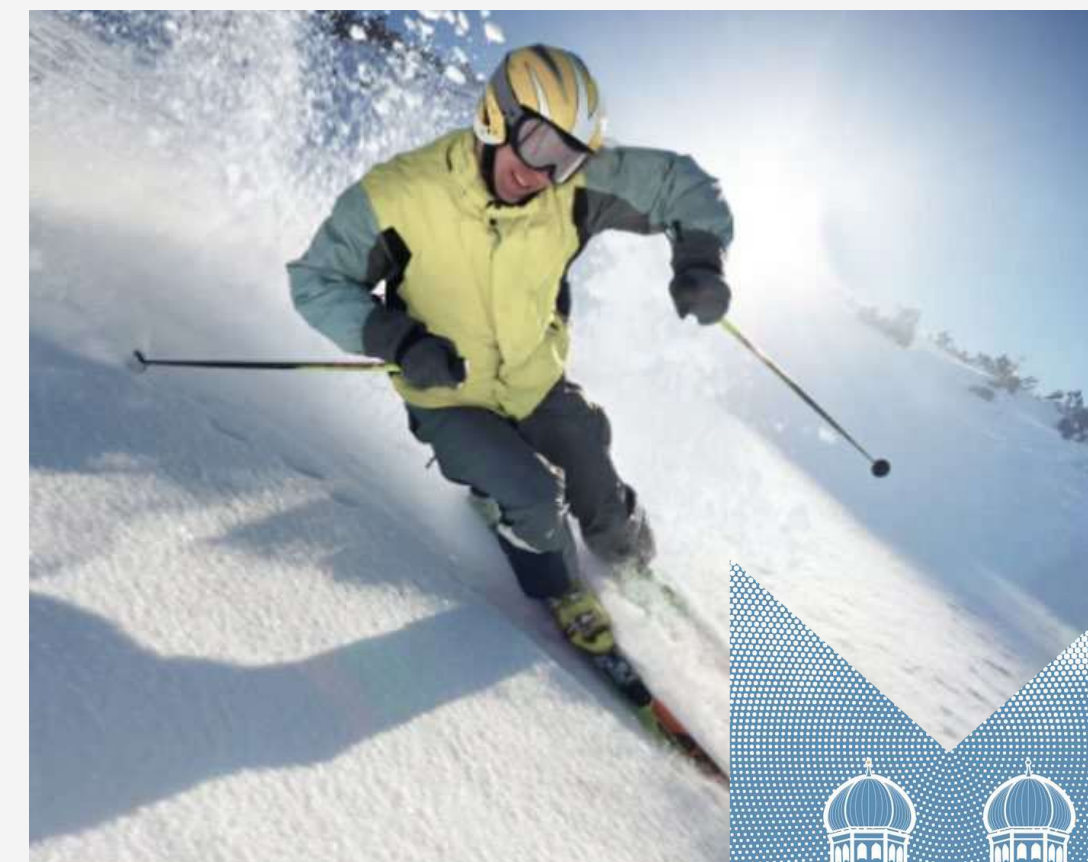
Exercise

Planned, structured and voluntary

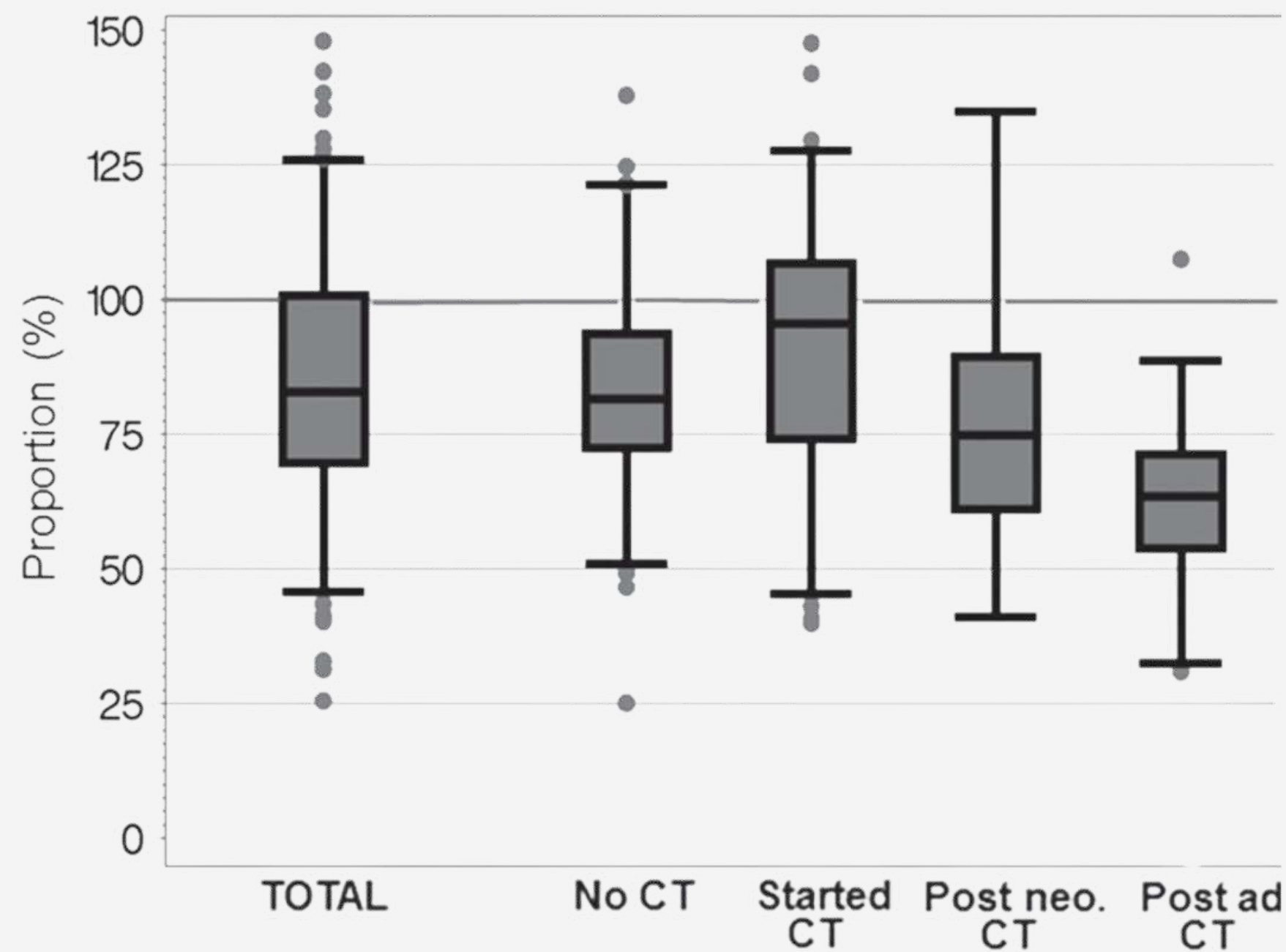


Sport

Rules, regulations and competitions



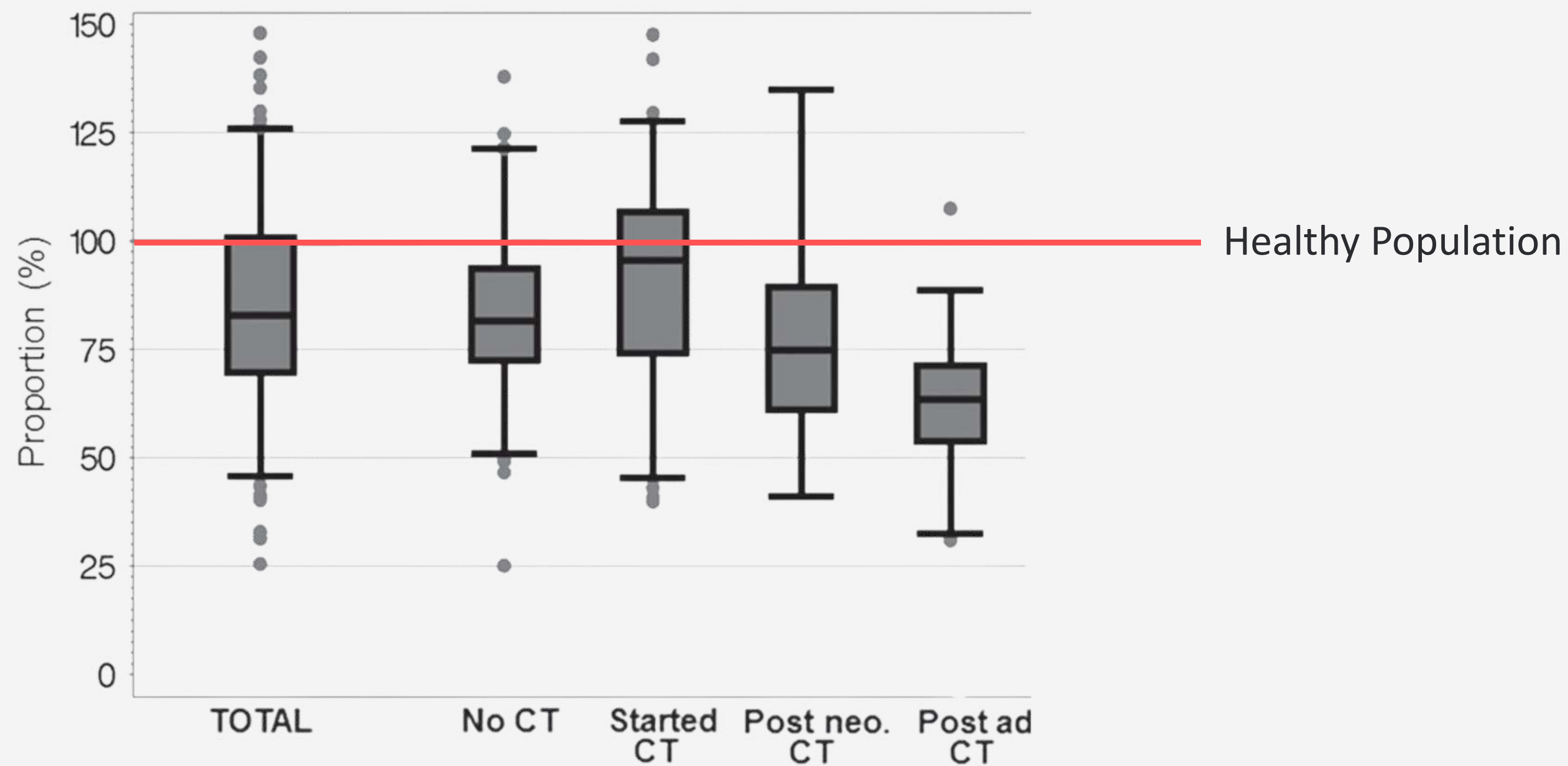
WHY DO WE NEED (MORE) SPORT?



MOD. AFTER KLASSEN ET AL. 2014; KOCH ET AL 1996



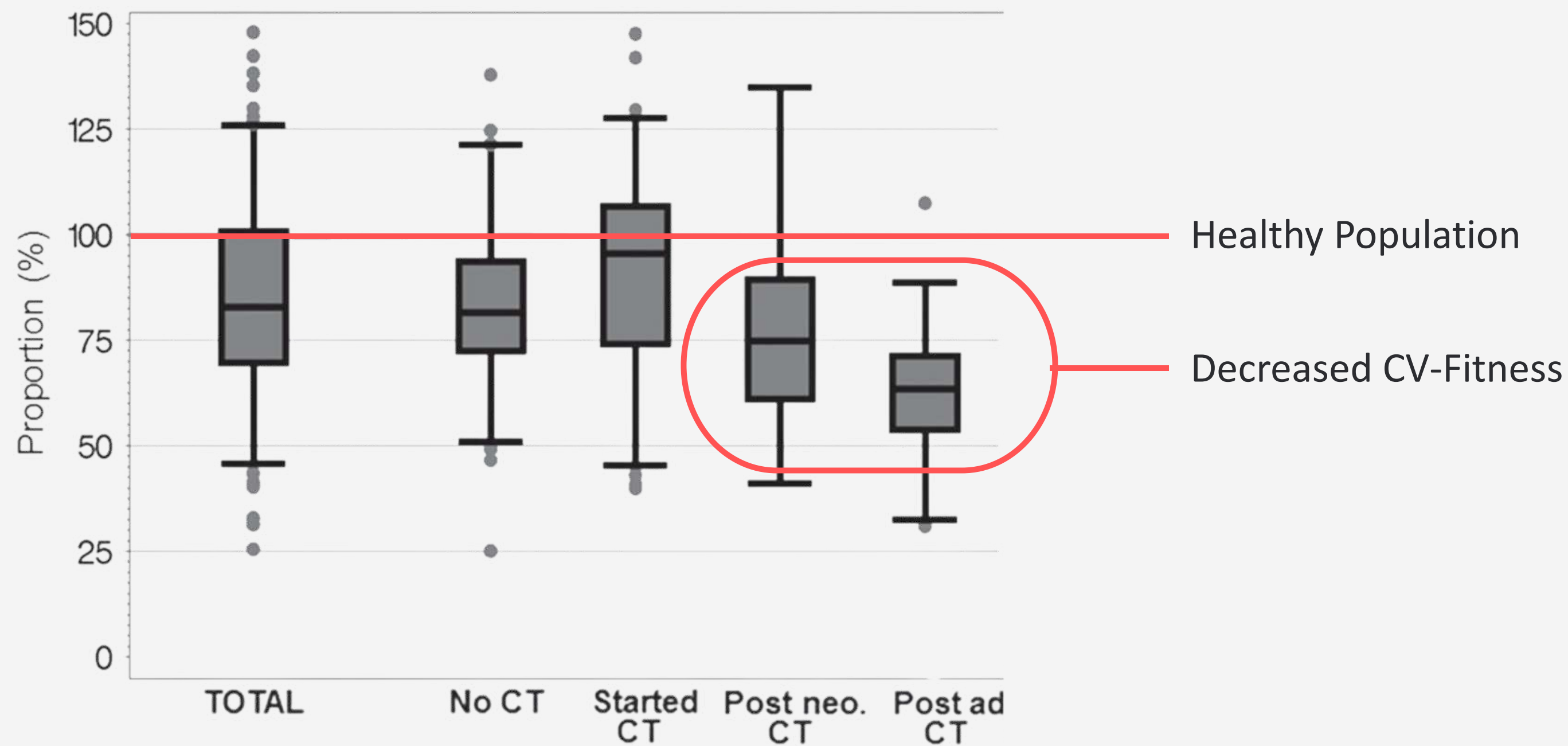
WHY DO WE NEED (MORE) SPORT?



MOD. AFTER KLASSEN ET AL. 2014; KOCH ET AL 1996



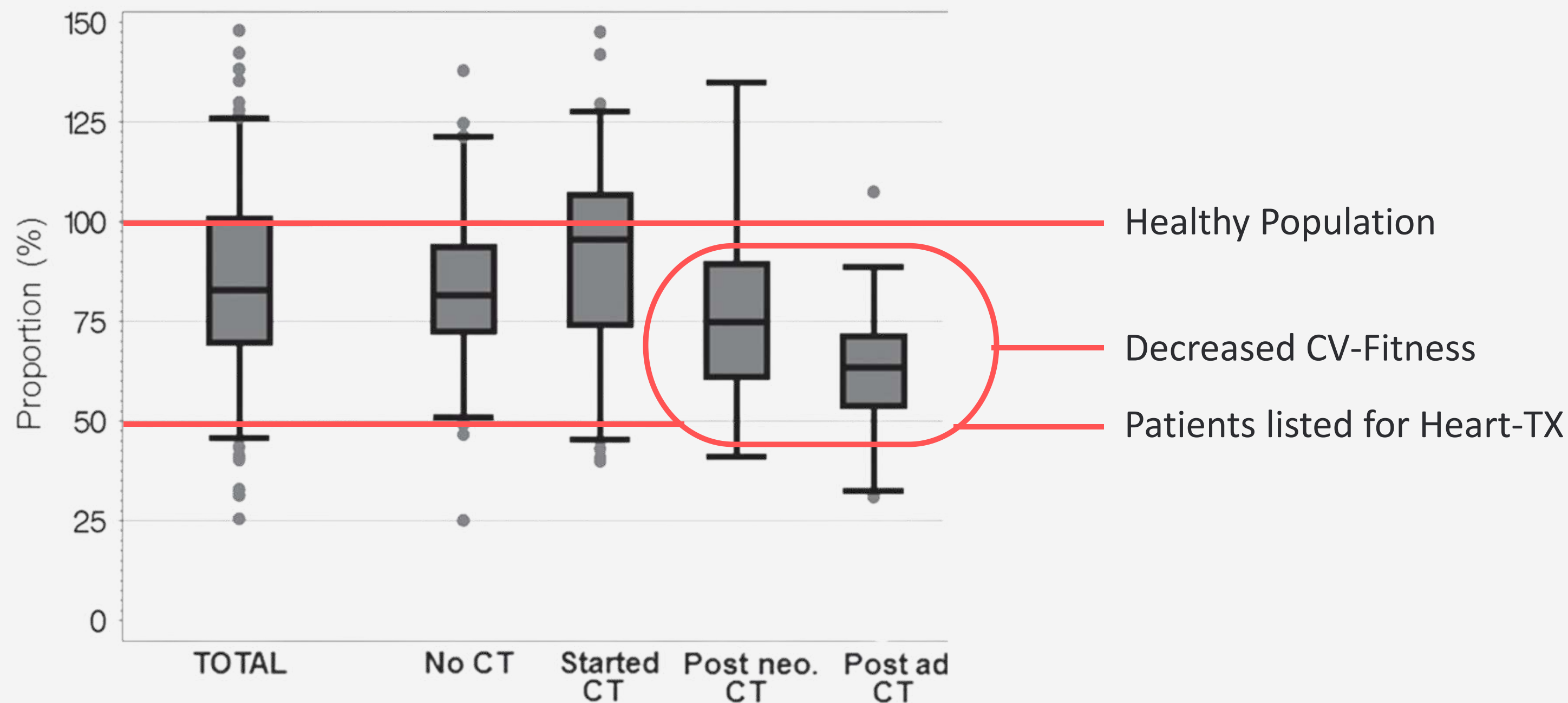
WHY DO WE NEED (MORE) SPORT?



MOD. AFTER KLASSEN ET AL. 2014; KOCH ET AL 1996



WHY DO WE NEED (MORE) SPORT?

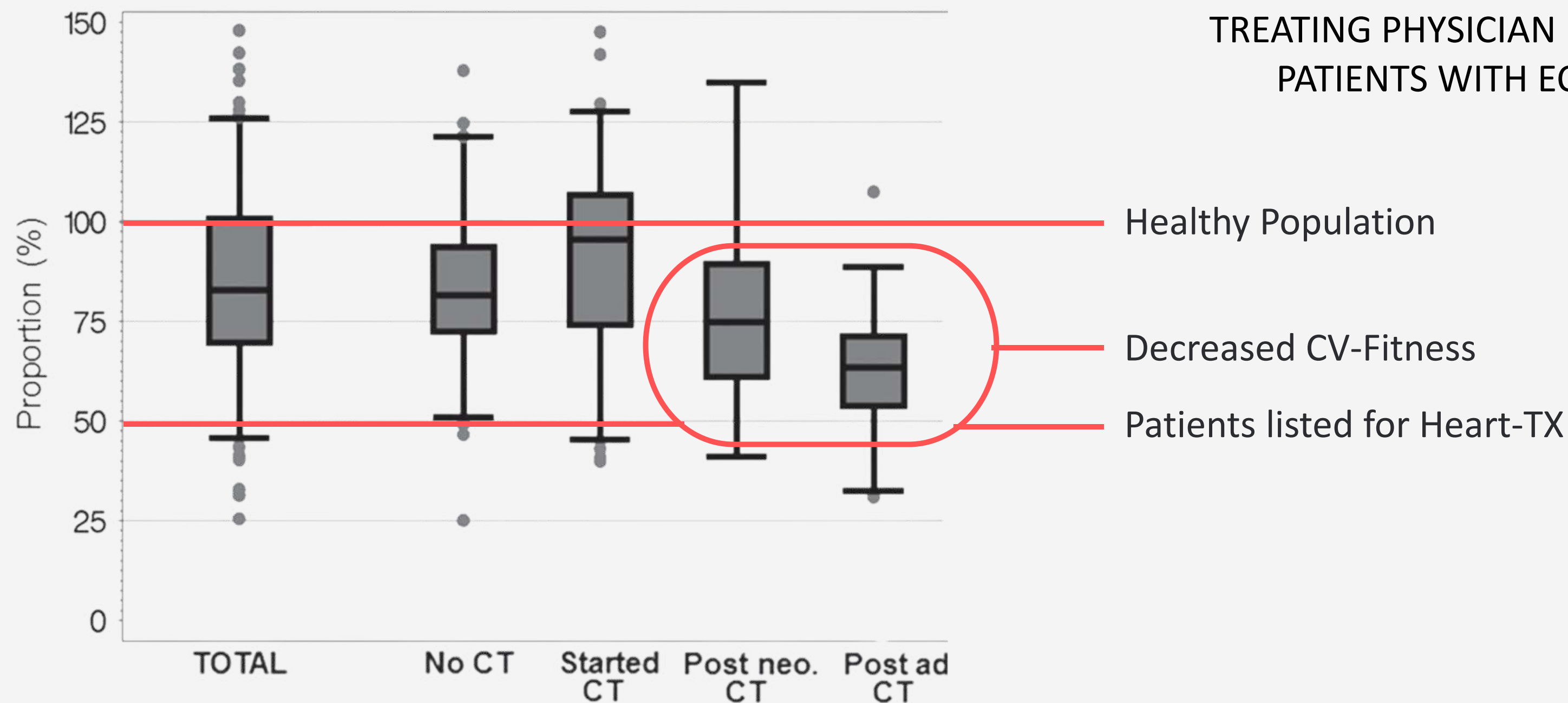


MOD. AFTER KLASSEN ET AL. 2014; KOCH ET AL 1996



WHY DO WE NEED (MORE) SPORT?

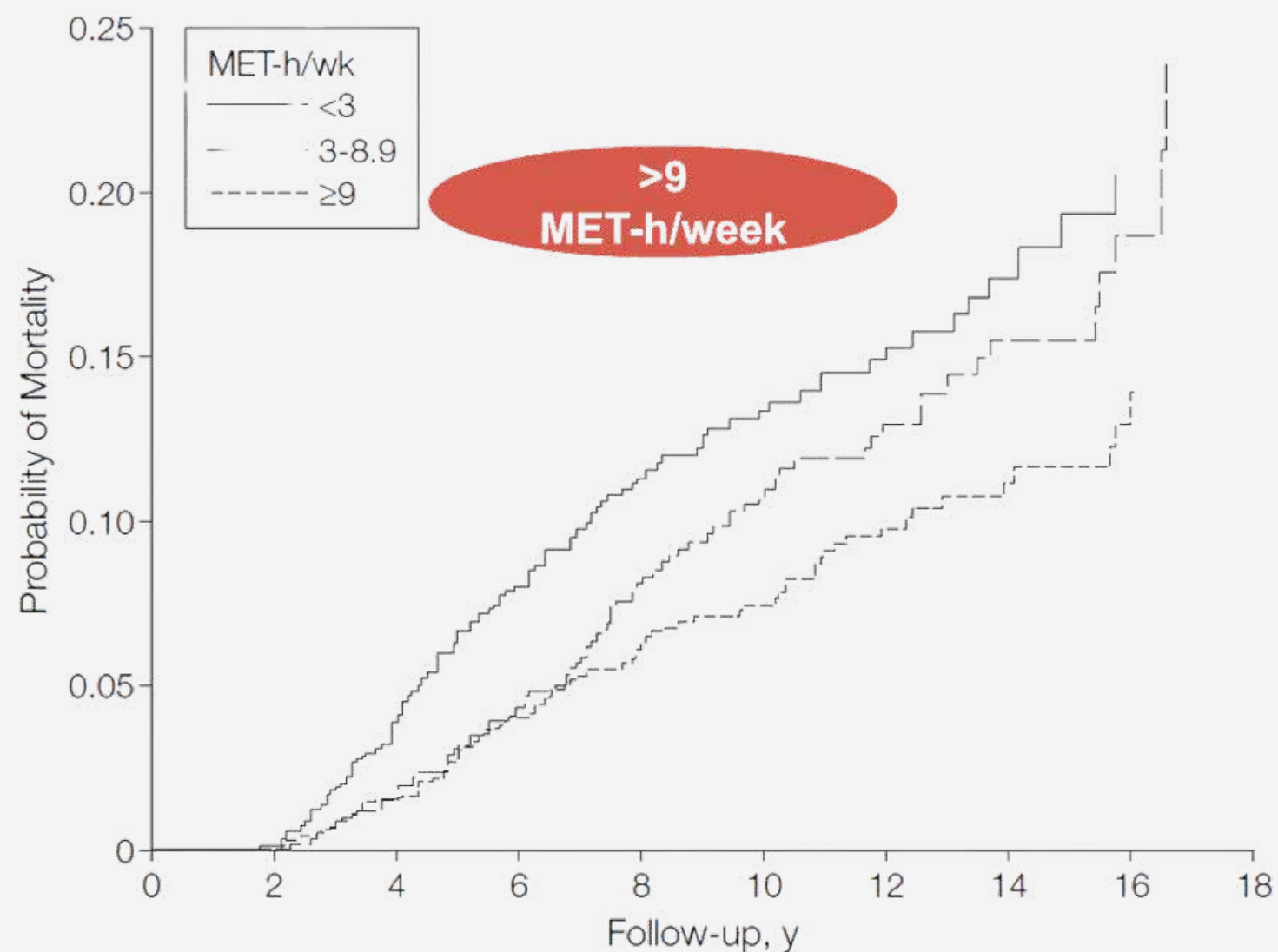
TREATING PHYSICIAN EVALUATED PATIENTS WITH ECOG = 0



MOD. AFTER KLASSEN ET AL. 2014; KOCH ET AL 1996



WHY DO WE NEED (MORE) SPORT?



No. at Risk

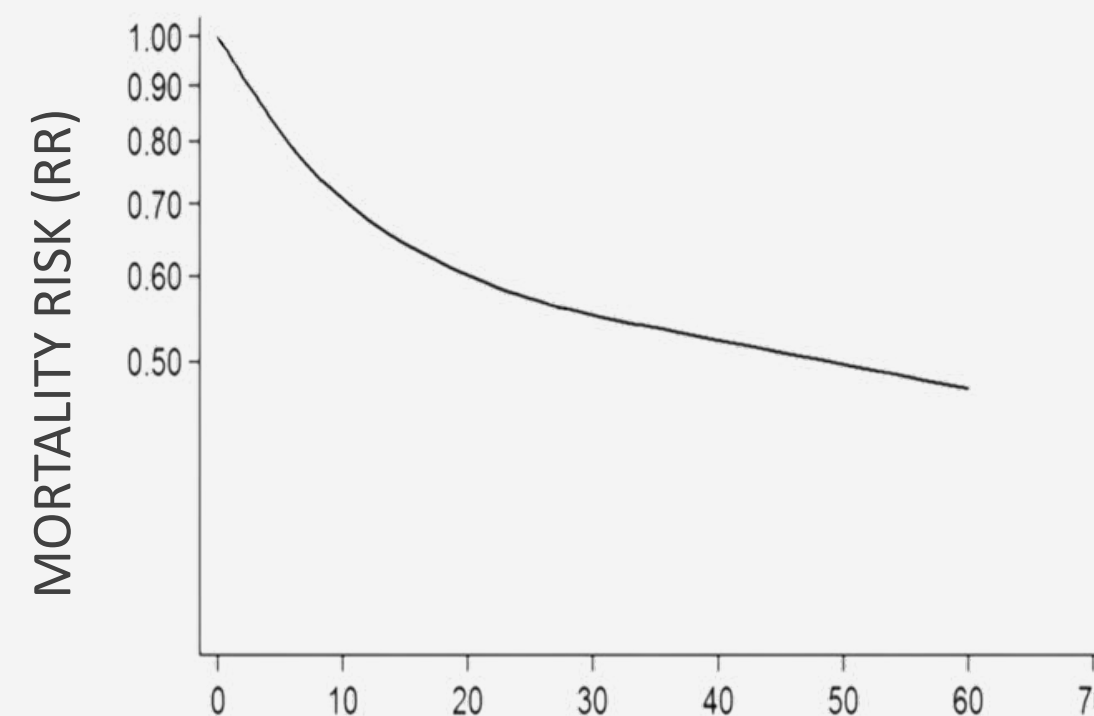
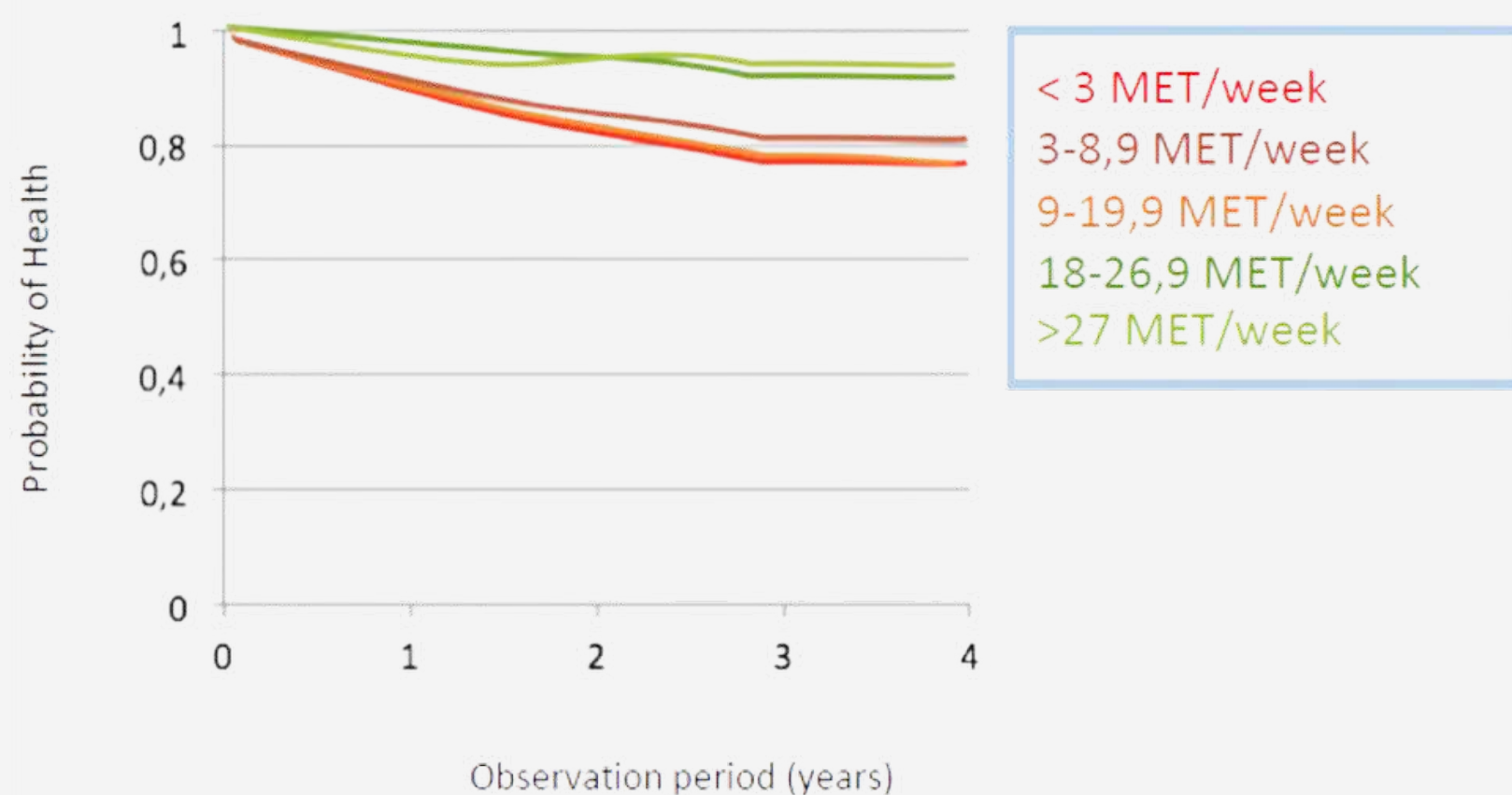
Physical Activity, MET-h/wk

<3	959	957	809	573	407	286	222	83	43
3-8.9	862	862	767	569	489	372	184	84	31
≥9	1166	1166	1066	773	692	449	290	164	86

MOD. AFTER HOLMES ET AL 2005



WHY DO WE NEED (MORE) SPORT?



THE RISK OF DYING AFTER COLON CANCER DECREASES BY 44% IF A TOTAL OF 27 MET*H/WEEK OF PHYSICAL ACTIVITY IS PERFORMED.

NUMBER OF MET-H PER WEEK

SOURCE: MEYERHARDT ET AL JCO 2016, LI T ET AL. BR J SPORTS MED 2016



WHY DO WE NEED (MORE) SPORT?

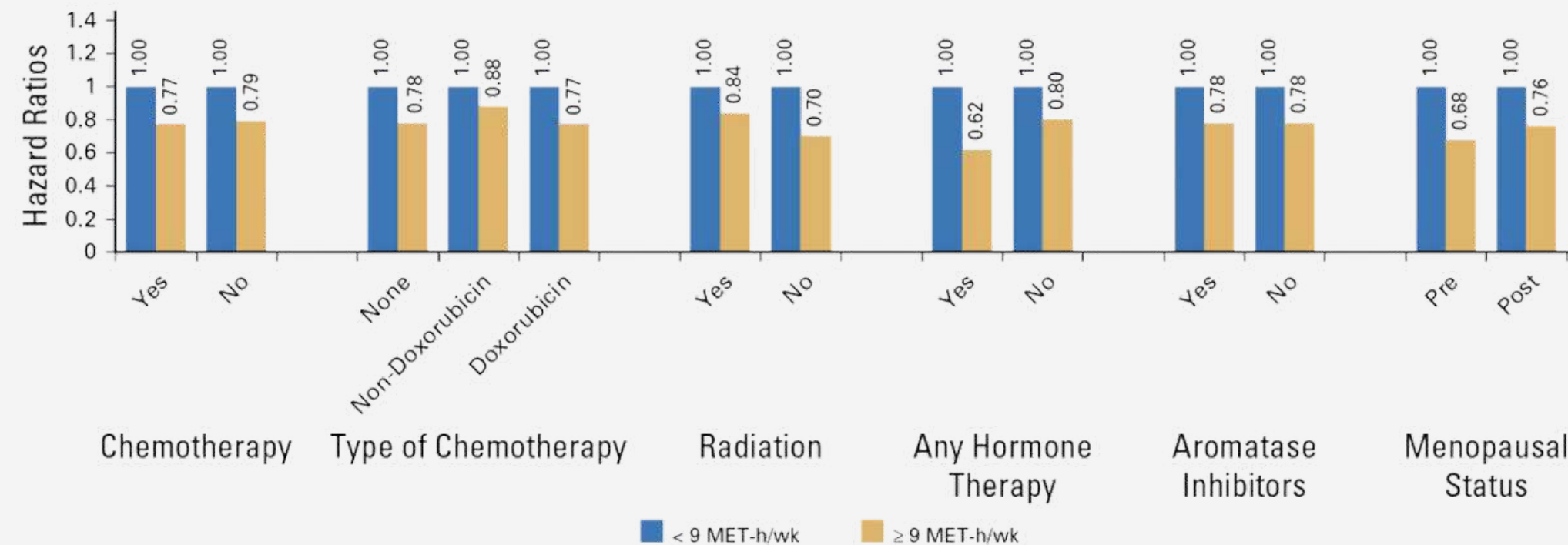
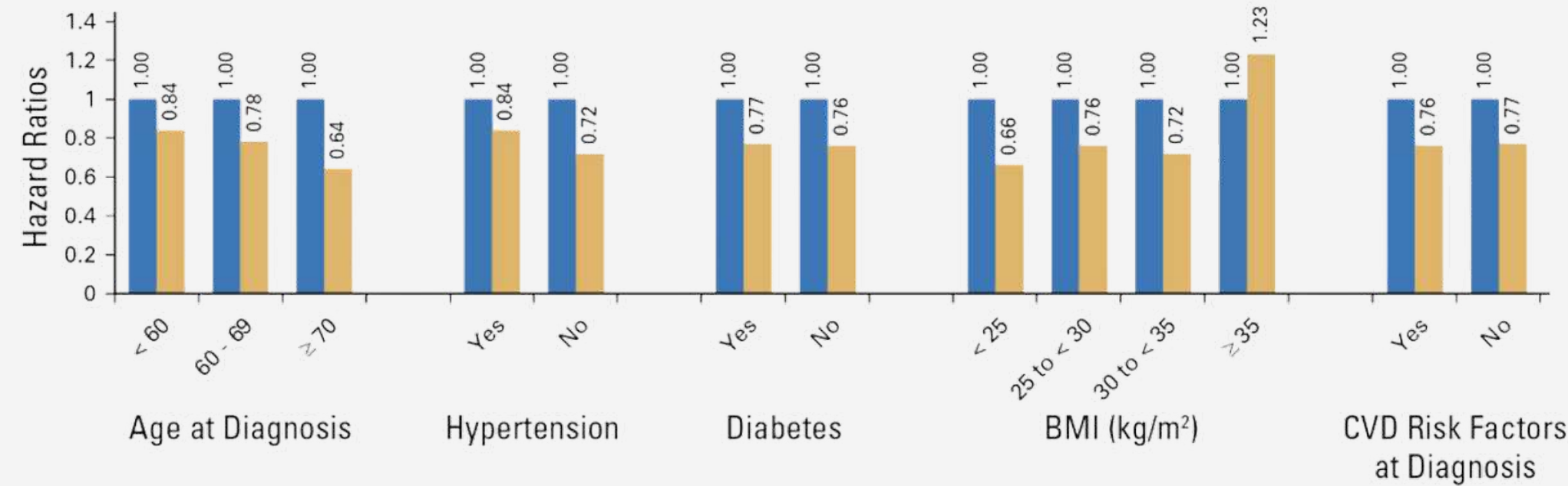
Activity	Energy consumption MET/h	To reach 9 METh/week:
Nordic walking (4 / 5 / 6 km/h)	3 / 4 / 5	3 h
Hiking	6	1.5 h
Water aerobics	4	2.25h
Yoga	2-3	3 h
Housework (Gardening)	2 (4)	5 h
Swimming	6-10	1.5 h
Shopping	2	4.5 h

Proven positive effect of > 9 (-15) METh/week



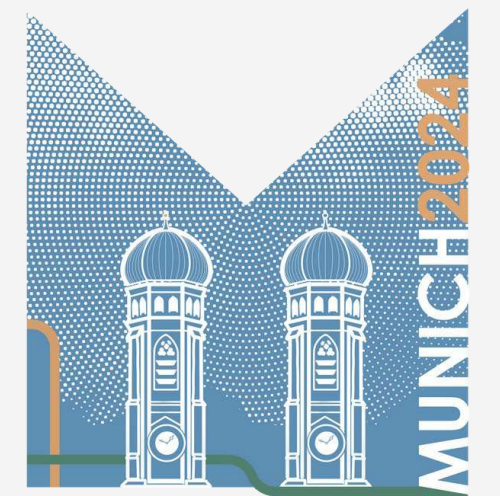
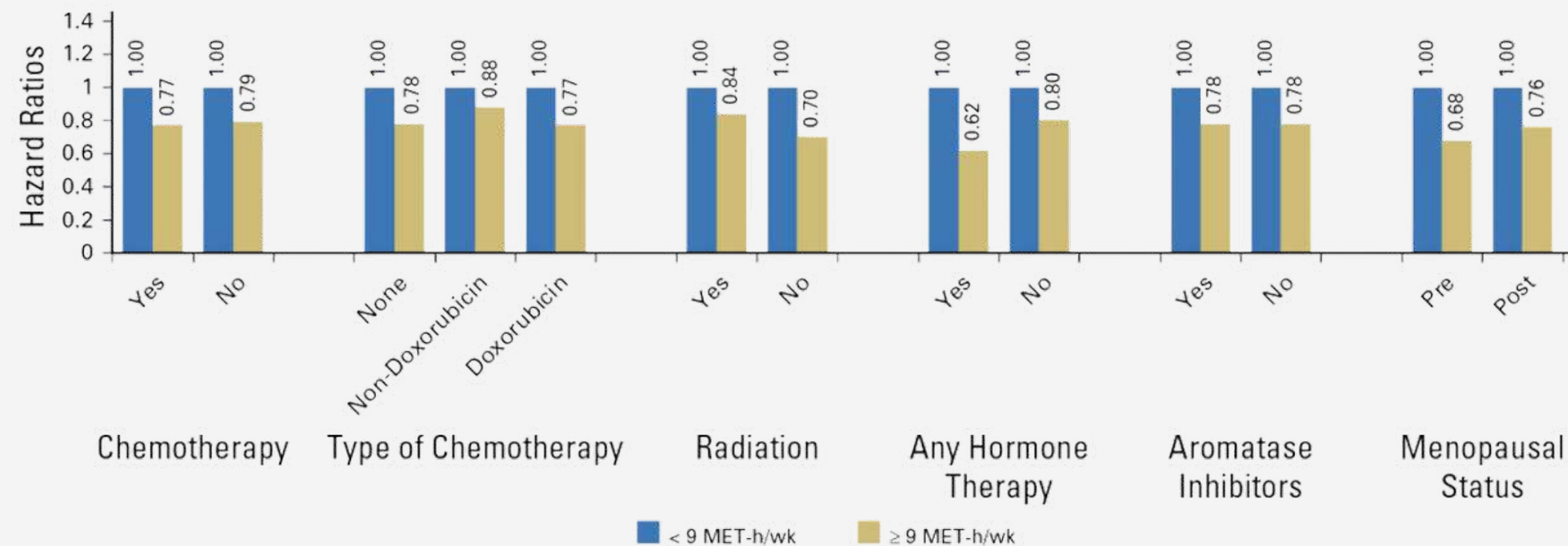
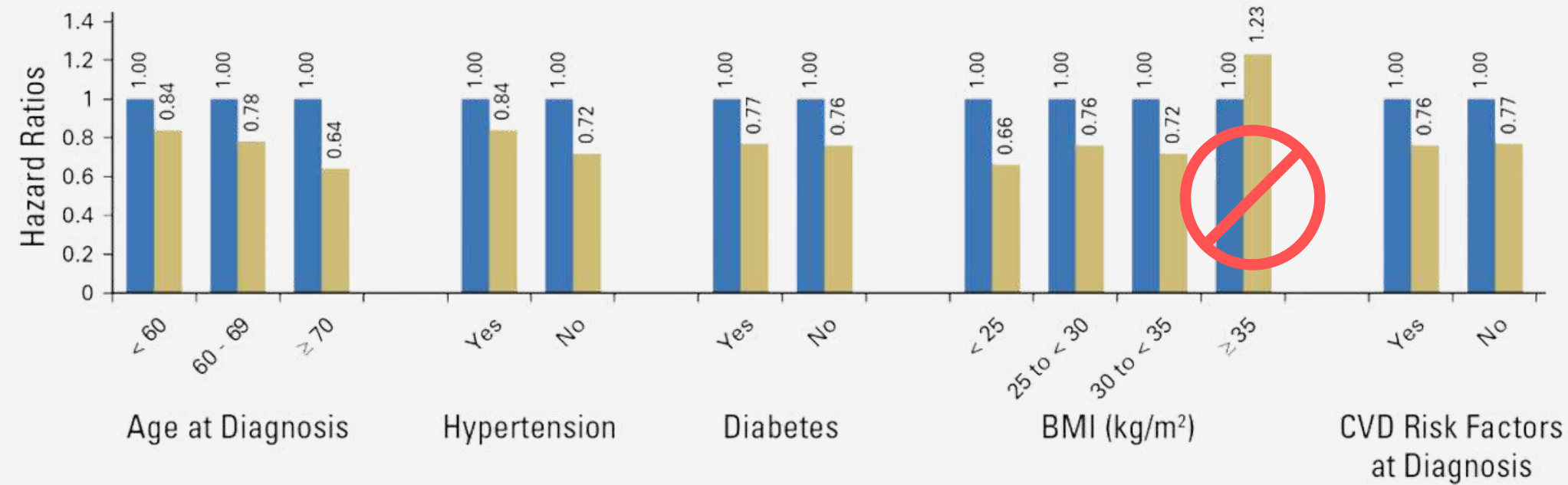
IS SPORT A (SAFE) DRUG?

MOD. AFTER JONES ET AL 2016



IS SPORT A (SAFE) DRUG?

MOD. AFTER JONES ET AL 2016



IS SPORT A (SAFE) DRUG?

Effects of Exercise on Health-Related Outcomes in Those with Cancer

What can exercise do?

- **Prevention of 7 common cancers***
Dose: 2018 Physical Activity Guidelines for Americans: 150-300 min/week moderate or 75-150 min/week vigorous aerobic exercise
- **Survival of 3 common cancers****
Dose: Exact dose of physical activity needed to reduce cancer-specific or all-cause mortality is not yet known; Overall more activity appears to lead to better risk reduction

*bladder, breast, colon, endometrial, esophageal, kidney and stomach cancers
**breast, colon and prostate cancers

Overall, avoid inactivity, and to improve general health, aim to achieve the current physical activity guidelines for health (150 min/week aerobic exercise and 2x/week strength training).

Outcome	Aerobic Only	Resistance Only	Combination (Aerobic + Resistance)
Strong Evidence	Dose	Dose	Dose
Cancer-related fatigue	3x/week for 30 min per session of moderate intensity	2x/week of 2 sets of 12-15 reps for major muscle groups at moderate intensity	3x/week for 30 min per session of moderate aerobic exercise, plus 2x/week of resistance training 2 sets of 12-15 reps for major muscle groups at moderate intensity
Health-related quality of life	2-3x/week for 30-60 min per session of moderate to vigorous	2x/week of 2 sets of 8-15 reps for major muscle groups at a moderate to vigorous intensity	2-3x/week for 20-30 min per session of moderate aerobic exercise plus 2x/week of resistance training 2 sets of 8-15 reps for major muscle groups at moderate to vigorous intensity
Physical Function	3x/week for 30-60 min per session of moderate to vigorous	2-3x/week of 2 sets of 8-12 reps for major muscle groups at moderate to vigorous intensity	3x/week for 20-40 min per session of moderate to vigorous aerobic exercise, plus 2-3x/week of resistance training 2 sets of 8-12 reps for major muscle group at moderate to vigorous intensity
Anxiety	3x/week for 30-60 min per session of moderate to vigorous	Insufficient evidence	2-3x/week for 20-40 min of moderate to vigorous aerobic exercise plus 2x/week of resistance training of 2 sets, 8-12 reps for major muscle groups at moderate to vigorous intensity
Depression	3x/week for 30-60 min per session of moderate to vigorous	Insufficient evidence	2-3x/week for 20-40 min of moderate to vigorous aerobic exercise plus 2x/week of resistance training of 2 sets, 8-12 reps for major muscle groups at moderate to vigorous intensity
Lymphedema	Insufficient evidence	2-3x/week of progressive, supervised program for major muscle groups does not exacerbate lymphedema	Insufficient evidence
Moderate Evidence			
Bone health	Insufficient evidence	2-3x/week of moderate to vigorous resistance training plus high impact training (sufficient to generate ground reaction force of 3-4 time body weight) for at least 12 months	Insufficient evidence
Sleep	3-4x/week for 30-40 min per session of moderate intensity	Insufficient evidence	Insufficient evidence

Citation: bit.ly/cancer_exercise_guidelines

Moderate intensity (40%-59% heart rate reserve or VO₂R) to vigorous intensity (60%-89% heart rate reserve or VO₂R) is recommended.

MOVING THROUGH CANCER | Exercise is Medicine | AMERICAN COLLEGE OF SPORTS MEDICINE

“PEOPLE WITH AND BEYOND CANCER SHOULD BE AS ACTIVE AS POSSIBLE – FOR THEM”

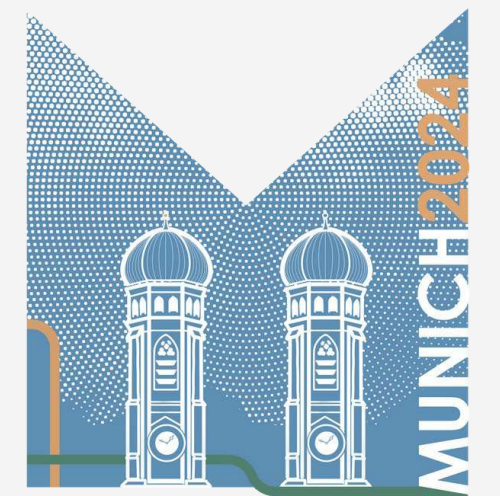
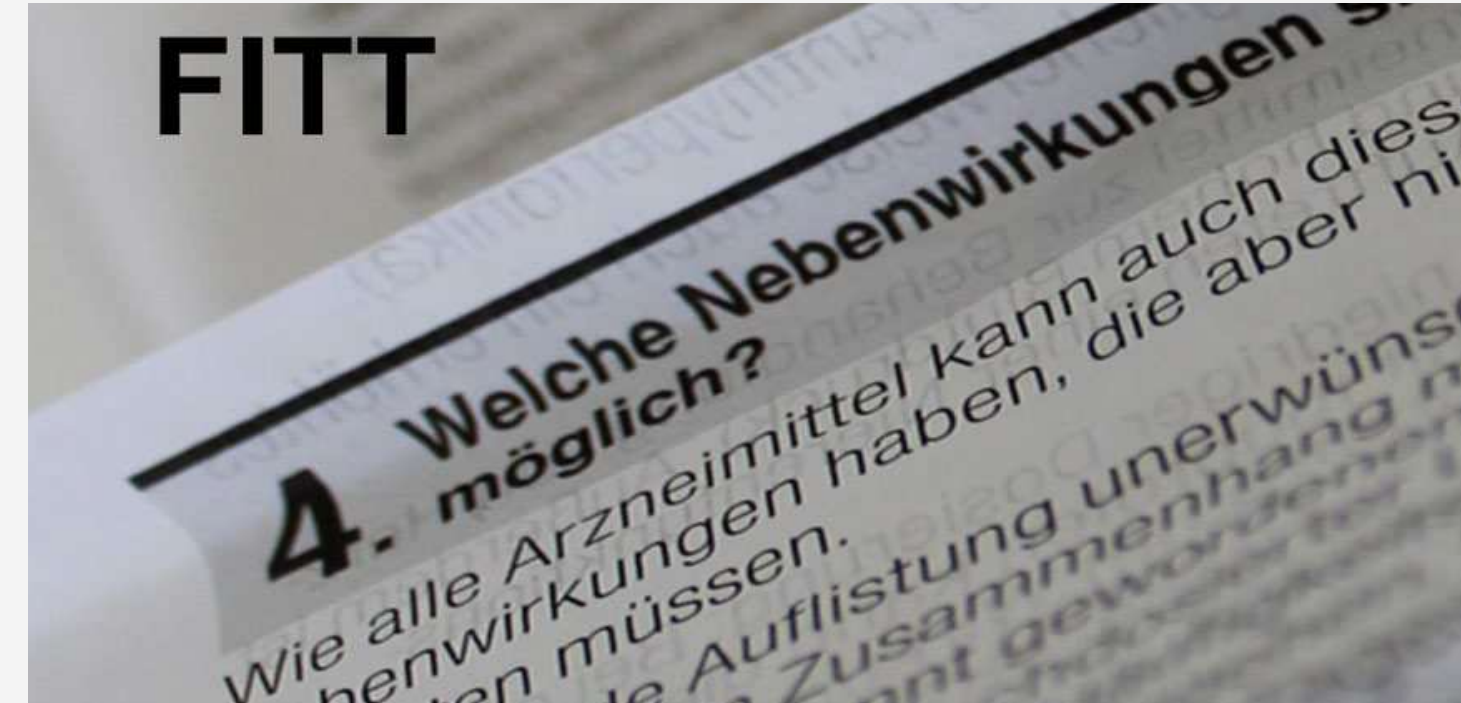
<https://www.acsm.org>



IS SPORT A (SAFE) DRUG?

F
I
T
T

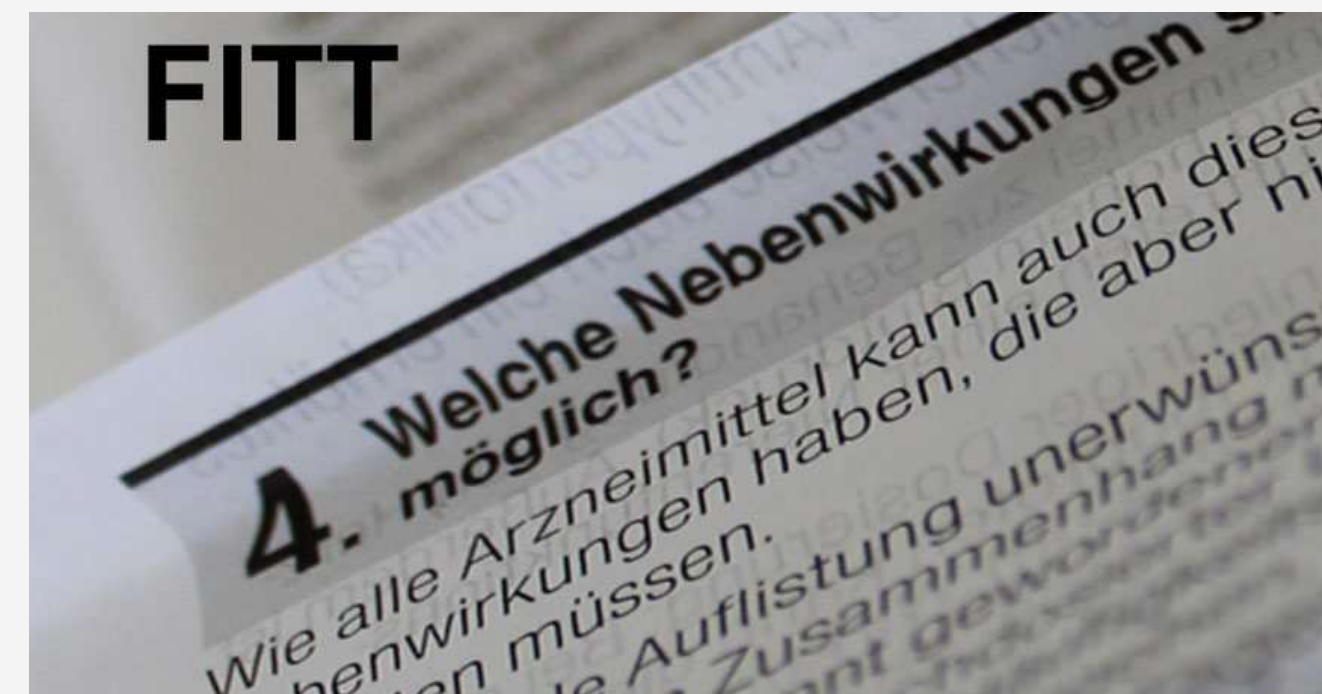
FREQUENCY- 5X/WEEK
INTENSITY - MODERATE: 75% HRMAX
TIME - 30MIN
TYPE - ENDURANCE / STRENGTH



IS SPORT A (SAFE) DRUG?

EFFECT:

- AE – MANAGEMENT (FATIGUE, DEPRESSION, SLEEPING, PAIN, NAUSEA...)
- QOL (QUALITY OF LIFE)
- LYMPHEDEMA
- BONE DENSITY
- SECONDARY DISEASES (CARDIOVASCULAR, ETC.)
- PROGNOSIS – 30% RISK REDUCTION (CSS, DFS AND OS)



IS SPORT A (SAFE) DRUG?

Name, Vorname des Versicherten		Bezugsdatum	Apotheken-Nummer / IK	
geb. am		Gesamt-Brutto		
Sport a «DRUG» FOR ALL		Arzneimittel- / Hilfsmittel- / Heilmittel-Nr.	Faktor	Taxe
Datum				

Rp. (Bitte Leerräume durchstreichen)

- 5X / WEEK MODERATE INTENSITY ENDURANCE TRAINING (E.G. NORDIC WALKING) AROUND 30MIN
- 2X / WEEK STRENGTH TRAINING (E.G. WEIGHT LIFTING)
- DAILY COORDINATION/MOBILITY/BALANCE

Dieses Rezept können Sie bei vielen gesetzl. Krankenkassen zur Voll- oder Teilerstattung als Satzungsleistung einreichen.

Unterschrift des Arztes



IS SPORT A (SAFE) DRUG?



AEROBIC

- 150 - 300 MINUTES OF MODERATE-INTENSITY
- 75 - 150 MINUTES OF VIGOROUS-INTENSITY



MULTICOMPONENT

- AEROBIC + STRENGTH + FUNCTIONAL
- BALANCE & MOBILITY
- > 3 DAYS A WEEK




STRENGTH

- MODERATE OR GREATER INTENSITY MORE THAN 2 DAYS A WEEK



LET'S DO SPORTS TOGETHER!

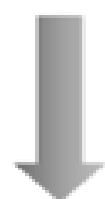


 outdooragainstcancer.com

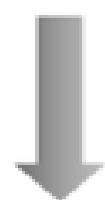
EARN 60 CME
OAC-Certified
Training

LEARN HOW TO TAILOR EXERCISE PROGRAMS FOR CANCER PATIENTS AND SURVIVORS, FOCUSING ON THEIR UNIQUE NEEDS AND EARN CME CREDITS. APPLY TO BECOME AN OAC TRAINER TODAY. JOIN US IN MAKING A DIFFERENCE.

Colon cancer



47%



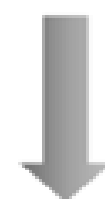
Fewer relapses

(Meyerhardt et al. JCO 2006)

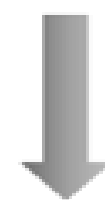
Less fatalities

(Je Y et al. Int J Cancer 2013
(Meta))

Breast cancer



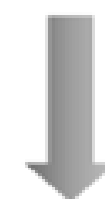
67%



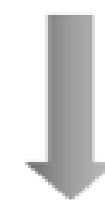
Less fatalities

(Irwin ML et al. JCO 2008,
Lahart IM et al. Acta Oncol 2015
(Meta))

Prostate cancer



57%



Rarer disease progression

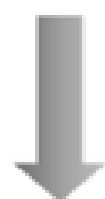
(Richman et al. Cancer Res 2011)

Less fatalities

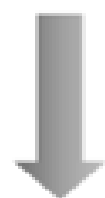
(Kenfield SA et al. JCO 2011)

Pict. 40: For the types of cancer shown in the graph, regular physical activity can reduce the risk of recurrence by up to 67% (for breast cancer)

Colon cancer

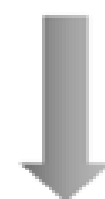


47%



Less recurrences
(Je Y et al. Int J Cancer 2013
(Meta))

Breast cancer

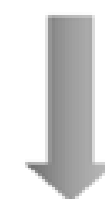


67%



Less recurrences
(Irwin ML et al. JCO 2008,
Lahart IM et al. Acta Oncol 2015
(Meta))

Prostate cancer



57%

Rarer disease progression
(Richman et al. Cancer Res 2011)
Less fatalities
(Kenfield SA et al. JCO 2011)

Exercise performed after diagnosis is even more effective

Pict. 40: For the types of cancer shown in the graph, regular physical activity can reduce the risk of recurrence by up to 67% (for breast cancer)

OAC

Ph.D. RŪDOLFS CEŠEIKO

EXERCISE HAS BEEN INCLUDED IN EUROPEAN SOCIETY FOR MEDICAL ONCOLOGY (ESMO) GUIDELINES.

CLINICAL ONCOLOGY SOCIETY OF AUSTRALIA
ACSM: GUIDELINES FOR EXERCISE AND CANCER
ESMO: PHYSICAL ACTIVITY AND CANCER OUTCOME

SEGAL R ET AL; EXERCISE FOR PEOPLE WITH CANCER GUIDELINE DEVELOPMENT GROUP. EXERCISE FOR PEOPLE WITH CANCER: A SYSTEMATIC REVIEW. CURR ONCOL. 2017
AUG;24(4):E290-E315. DOI: 10.3747/CO.24.3619. EPUB 2017 AUG 31. PMID: 28874900; PMCID: PMC5576469

<https://www.cosa.org.au/media/332488/cosa-position-statement-v4-web-final.pdf>



FROM “ONE FITS ALL” APPROACH TOWARD AN INDIVIDUALIZED APPROACH.

- Intensity
- Frequency
- Volume
- Duration
- Within the context of a patient’s life
- During the cancer continuum (patient-centered approach)



PHYSICAL CAPACITIES (FITNESS)

OAC

Ph.D. RŪDOLFS CEŠEIKO

MEASURABLE COMPONENTS:

- Cardiorespiratory endurance
- Muscle strength
- Muscle endurance
- Body composition
- Flexibility (range of motion)



CASPERSEN CJ, POWELL KE, CHRISTENSON GM. PHYSICAL ACTIVITY, EXERCISE, AND PHYSICAL FITNESS: DEFINITIONS AND DISTINCTIONS FOR HEALTH-RELATED RESEARCH. PUBLIC HEALTH REP. 1985 MAR-APR;100(2):126-31. PMID: 3920711; PMCID: PMC1424733.



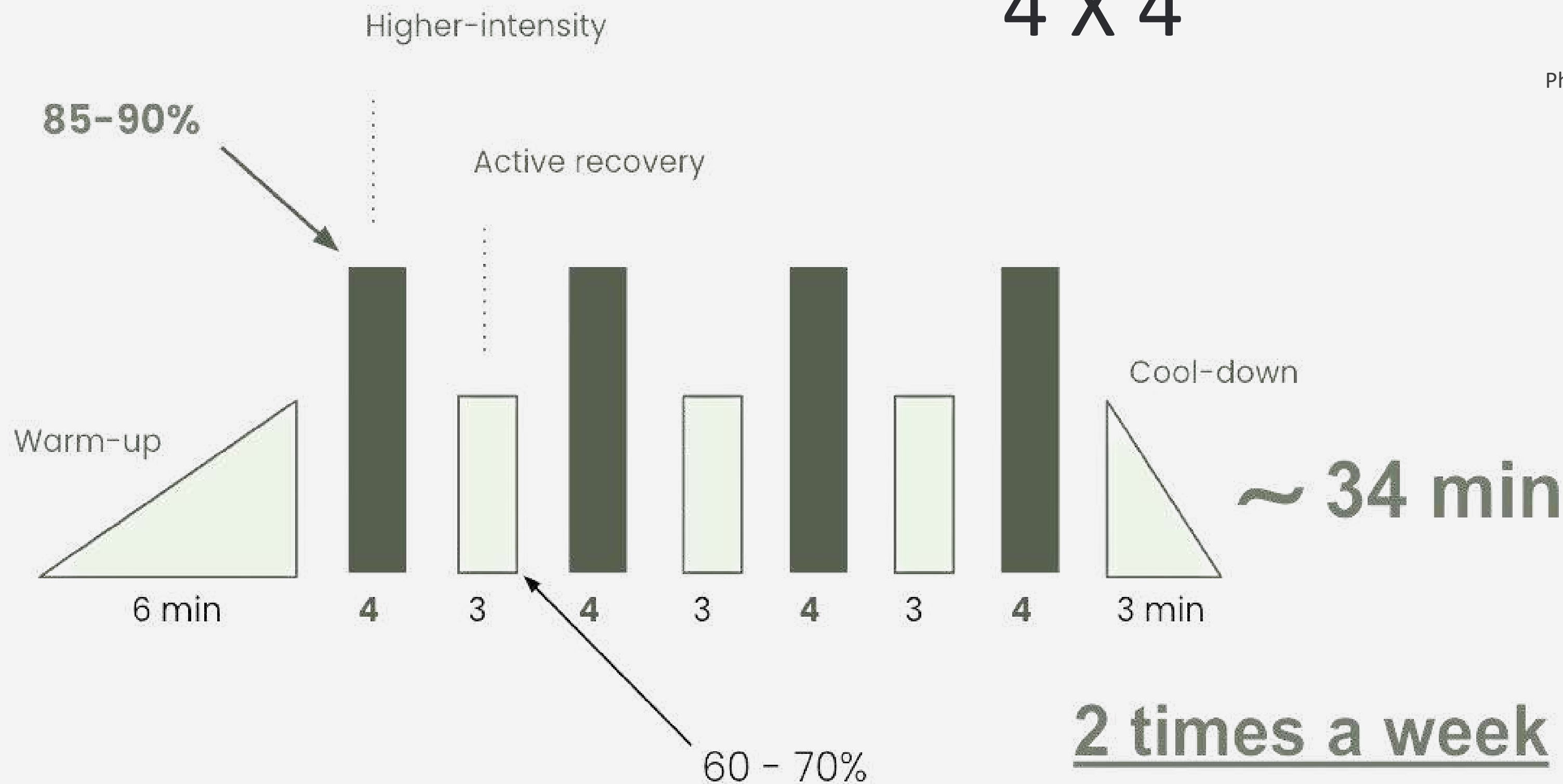
CARDIORESPIRATORY ENDURANCE

THREE MAJOR FACTORS ACCOUNTING FOR INTERINDIVIDUAL VARIANCE

- **MAXIMAL OXYGEN UPTAKE (VO₂MAX)**
- **LACTATE THRESHOLD**, THE HIGHEST INTENSITY OF WORK AT WHICH THE BLOOD LACTATE CONCENTRATION GRADUALLY STARTS TO INCREASE DURING CONTINUED WORK
- **WORK ECONOMY**, THE RATIO BETWEEN WORK OUTPUT AND OXYGEN COST



4 X 4



MAXIMAL HEART RATE CALCULATION (HR_{MAX}): $211 - (0.64 * AGE) =$



NOVELTY-STRENGTH TRAINING

OAC

Ph.D. RŪDOLFS CEŠEIKO

CONVENTIONAL STRENGTH TRAINING

- ONE REPETITION MAXIMUM (1RM) CALCULATED
- LOW OR MODERATE INTENSITY **25-75%**
- 1-3 SETS, 8-12 REPETITIONS
- 4 WEEKS TO 12 MONTHS
- THE SLOW MOVEMENT IN A CONCENTRIC ACTION
- AFTER TREATMENT

MAXIMAL STRENGTH TRAINING (NEURAL DRIVE)

- 1RM TESTED IN STANDARDIZED MOVEMENT
- HIGHER INTENSITY **85-95%**
- 4 SETS, 4 REPETITIONS
- 12 WEEKS TO **6 YEARS** (TWICE A WEEK)
- **MAXIMAL MOBILIZATION OF THE FORCE** IN CONCENTRIC ACTION
- DURING TREATMENT

MINIMAL ADAPTIVE THRESHOLD 66 – 70% OF 1RM

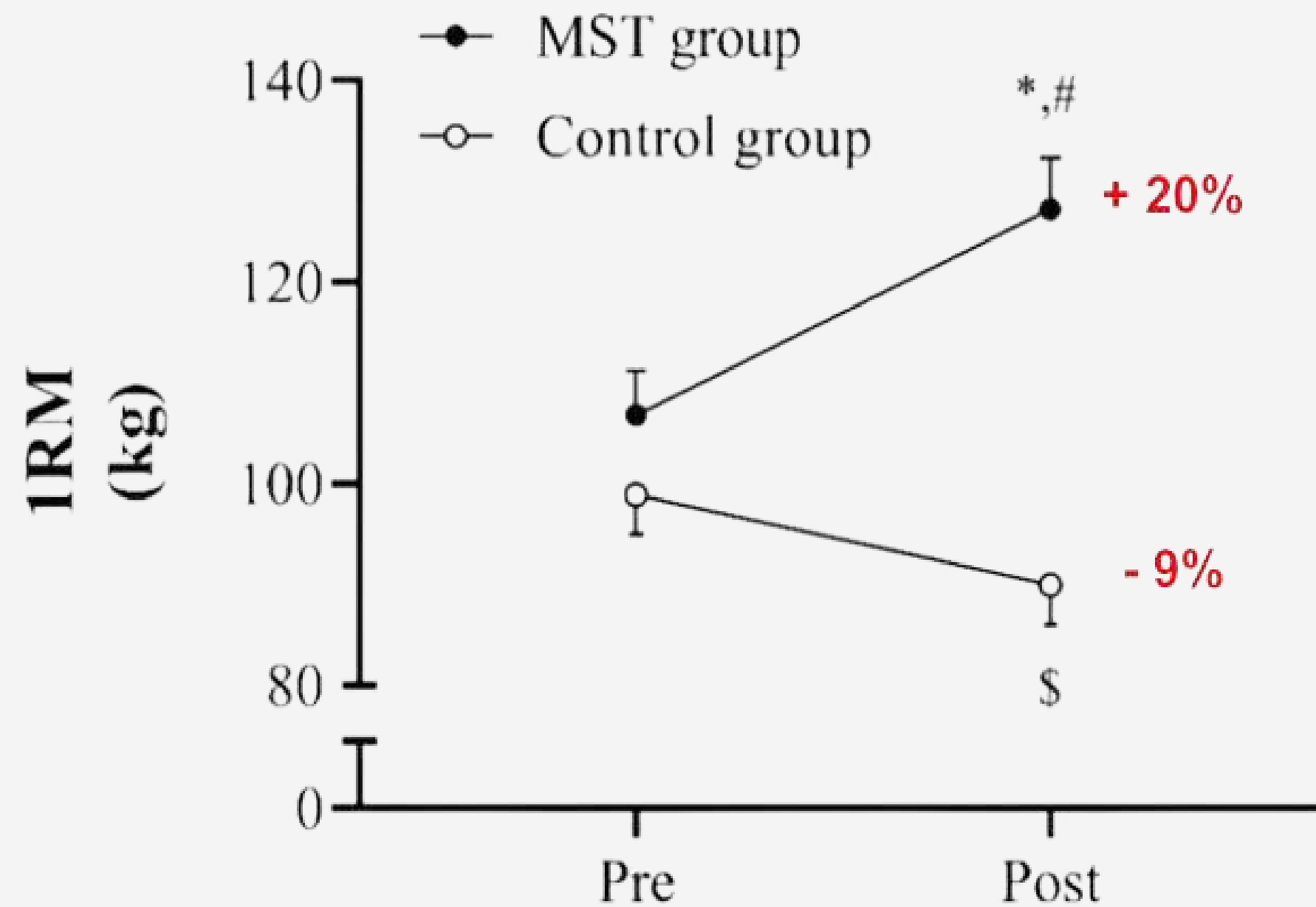
(MCDONAGH 1984; HOFF 2004; FIMLAND 2010).



MAXIMAL MUSCLE STRENGTH

OAC

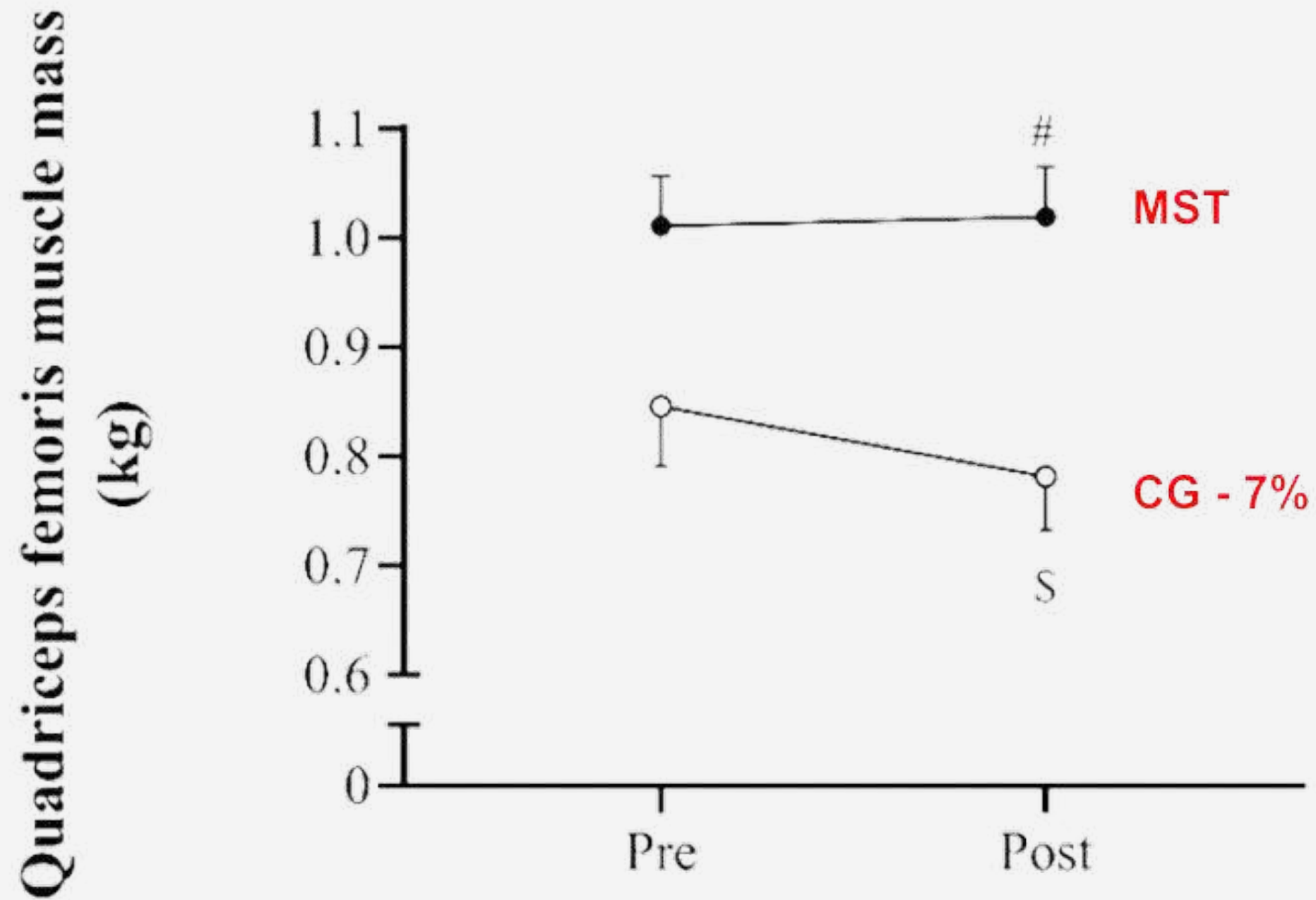
Ph.D. RŪDOLFS CEŠEIKO



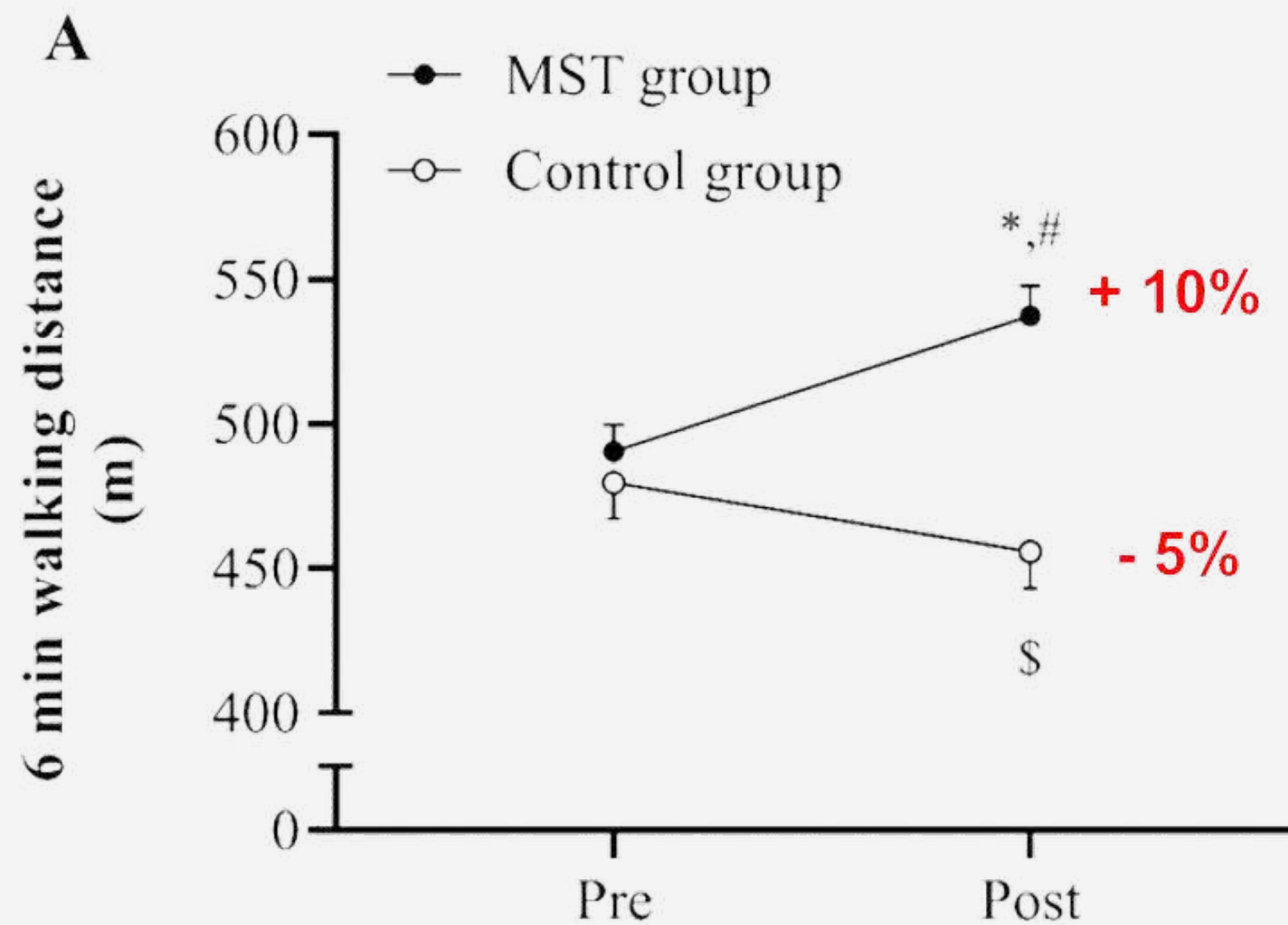
MUSCLE MASS

OAC

Ph.D. RŪDOLFS CEŠEIKO



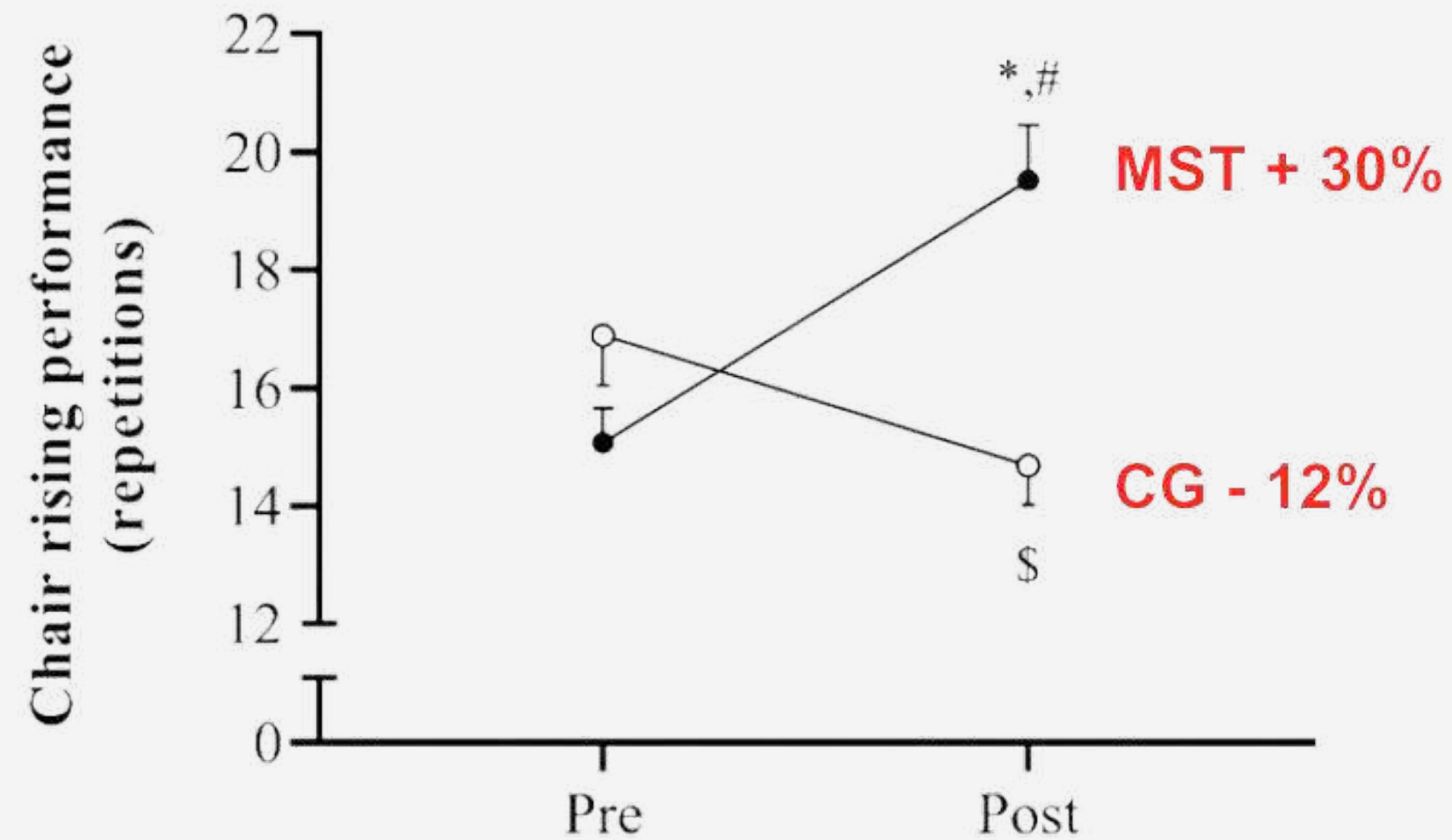
Functional performance (6 min walking test)



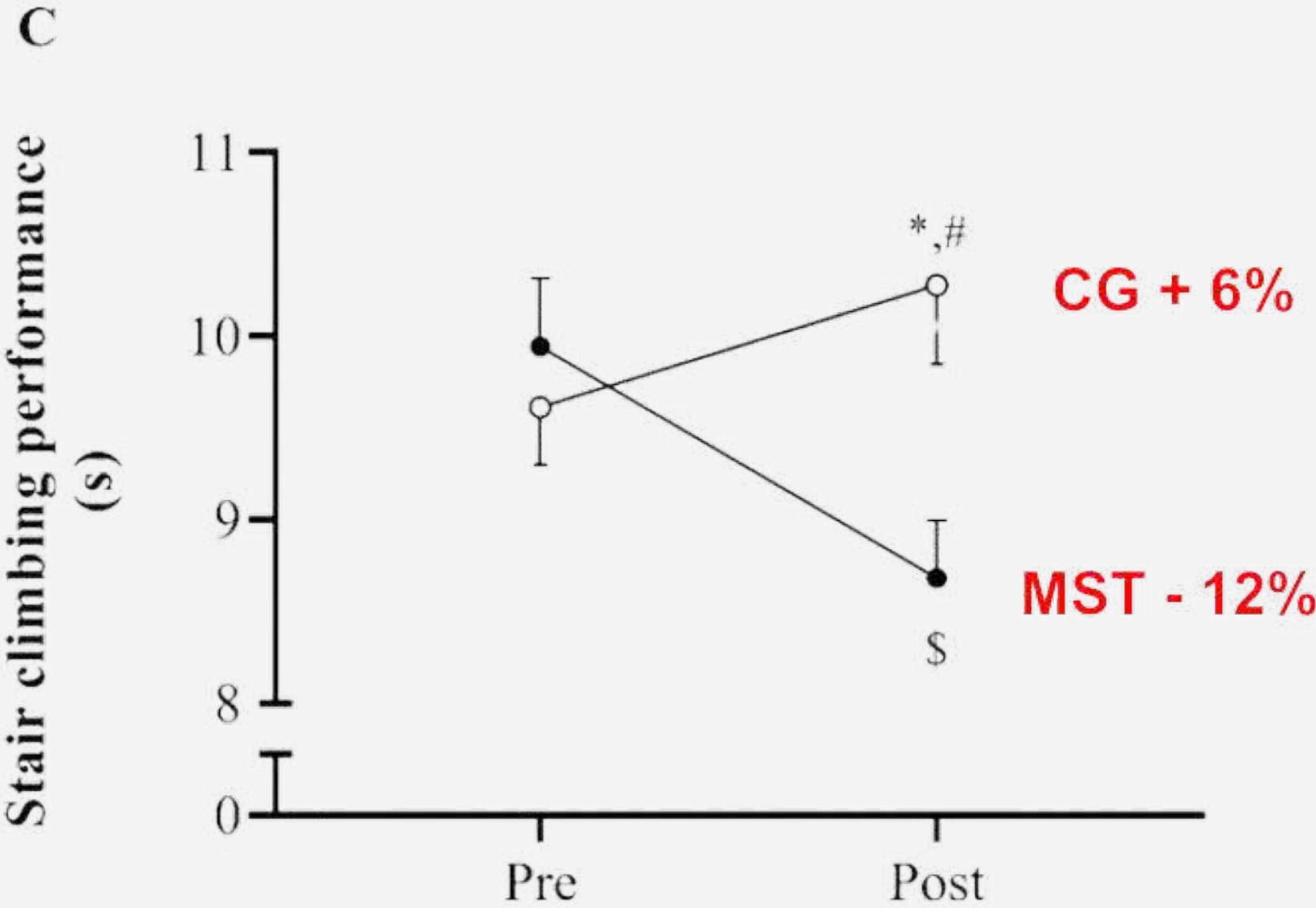
Functional performance (30s sit to stand test)



B



Functional performance (Stair Climb Test)

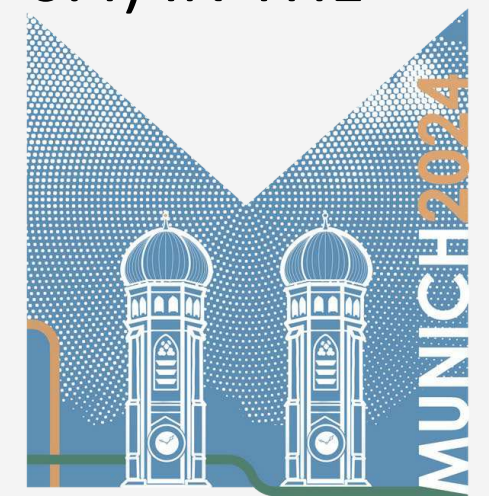


Health-related quality of life (EORTC QLQ-C30)

OAC

Ph.D. RŪDOLFS CEŠEIKO

- THE GLOBAL HEALTH STATUS/QOL IMPROVED BY 13% (P=0.002, D=0.6).
- CANCER-RELATED FATIGUE DIMINISHED BY 24% (P=0.03, D=0.6)
- WORSENER BY 25% (P=0.02, D=0.4) IN THE CONTROL GROUP.
- ROLE FUNCTIONING INCREASED BY 23% (P=0.001, D=0.7).
- SOCIAL FUNCTIONING BY 12% (P=0.01, D=0.5).
- EMOTIONAL FUNCTIONING IMPROVED BY 13% (P=0.001, D=0.5), DECREASED BY 11% (P=0.02, D=0.4) IN THE CONTROL GROUP.



Clinical implications for cancer rehabilitation

- Adherence rate of **96%** of all training sessions (23/24).
- Only one exercise, a dynamic leg press, was performed.
- Low costs.
- Time efficient, less than **1 hour** of training per week.
- Patients can train in small groups of 3-5 people per exercise machine.





OAC

Ph.D. RŪDOLFS CEŠEIKO

PERSPECTIVES

Exploring the molecular mechanisms behind the effects of exercise





Physical Activity Recommendations for Cancer Patients

IMPORTANT!

Please **consult your attending physician on the best time** for starting physical activity.

It is advisable to keep a close eye on your well-being (*there may be days when you rest and do not do exercise*).

After surgery (3-6 weeks), avoid prolonged, monotonous movements during strength workout.

Regular physical activity without long breaks (*longer than 2 weeks*) is preferable.

It is essential to observe a 6-minute warm-up phase!

BENEFITS OF PHYSICAL ACTIVITY:

- ✓ Contributes to the efficacy of therapy, improves physical performance
- ✓ Reduces side effects of therapy
- ✓ Reduces fatigue (*more energy*)
- ✓ Reduces depression risk
- ✓ Improves sleep quality
- ✓ Helps to carry out daily activities and maintain working capacity
- ✓ Strengthens immune system
- ✓ Improves quality of life
- ✓ Reduces risk of cancer recurrence
- ✓ Helps to maintain brain health
- ✓ Helps to control body weight
- ✓ Reduces risk of lymphoedema

Start gradually and increase the amount of physical activity over time.



1. Warm-up phase = 6 minutes.

Preparation of the body for transition from rest to higher/more intense physical activity by raising the body temperature until you feel warmer.

Set a timer for 6 minutes
and start with a slow or dynamic walk.

If you feel well, then move on to the basic exercise -
aerobic endurance and/or strength workout.

If, however, physical activity makes you feel worse,
be gentle with yourself and try again the next day.

2. Physical activity: aerobic exercise.

Endurance training, cardiovascular exercise (whole body is involved in the activity).

The recommended amount of activities for a moderate intensity workout (able to maintain a conversation with another person during workout) would be 150-300 minutes per week, or 75 minutes in the event of higher intensity loads (maintaining a conversation with another person becomes more difficult). Borg scale*



walking with purpose



walks at different paces



Nordic walking



cycling



slow jog

POSSIBLE VARIATIONS

~15-30 min.
every day

~40-60 min.
4 x per week

~20 min.
7 x per week

2-3 x per week at intervals
4 min. slowly, 4 min. faster; repeat 4x4 principle four times



3. Physical activity: strength workout.

2-3 sessions per week with strength exercises for large muscle groups: back, shoulder girdle, arm and leg muscles.



squats, body weight



dumbbells of different weights



strength workout machines



resistance bands

INCLUSION OF 3-6 DIFFERENT EXERCISES THAT INVOLVE SEVERAL JOINTS IS PREFERABLE

Use **free weights**, for instance, dumbbells, bars of different weights, exercise machines, resistance bands, your own body weight (*squats, chair sit-downs/sit-ups*).

When starting each exercise, **use a light** weight, and lift it ~10 times.

Perform **2-3 sets of 6-12 repetitions** per set with a heavier weight, for the respective muscle group.

1-3 min. break between sets.

Raise and lower the weights in a controlled manner (*raise the weight for 2 seconds and lower it for 2 seconds*).

You can gradually increase the resistance.



4. Cool-down phase.

The purpose of the cool-down is to stabilise the heart rate and blood pressure by gradually reducing intensity and body temperature.

Slow or dynamic walk, alternatively - jogging on the spot for 3-6 minutes.

Easy, pleasant stretching (*rotate shoulders, hip joints, ankles, it is important to pay attention to the joints and muscles that have been involved in the activity*).

During chemotherapy, radiotherapy, targeted therapy and immunotherapy.

Starting exercise is usually the hardest part, the **6-minute warm-up phase** helps to evaluate your feelings about the appropriateness of the activity on the particular day.

ADDITIONAL INFORMATION. <https://aktivitasuklinika.lv/> E-mail: info@aktivitasuklinika.lv, <https://www.dzivibaskoks.lv/lv/>, <https://www.onkologi.lv/>, <https://onkomed.lv/>, <https://onko.lv/> Rehabilitation Clinic or Riga East University Hospital (RAKUS), Psycho-emotional Support Office for Cancer Patients, Physical Medicine and Rehabilitation Centre of Pauls Stradiņš Clinical University Hospital (PSKUS)

REFERENCES

*Borg G. Psychophysical bases of perceived exertion. Med Sci Sports Exerc. Vol.14(5), 1982. P.377-381.
<https://www.esmo.org/content/search?searchText=exercise+guidelines>
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8576825/>
Exercise Guidelines for Cancer Survivors: Consensus statement from International Multidisciplinary Roundtable

LOKA

Latvijas Onkologu
Ķīmijterapietu Asociācija



Publisher: Roche Latvija, SIA, Miera 25, Rīga, LV-1001,
Phone.: +371 67039831, e-mail: riga.info_latvija@roche.com
September 2023. M-LV-00000701. Electronic version of the publication available at: onko.lv

