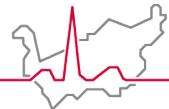




Hôpital du Valais
Spital Wallis

Prävention und Gesundheitsförderung in der Geriatrie

Dr. Martial Coutaz
Departement Innere Medizin / Geriatrie

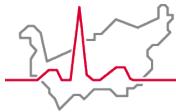


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Übersicht

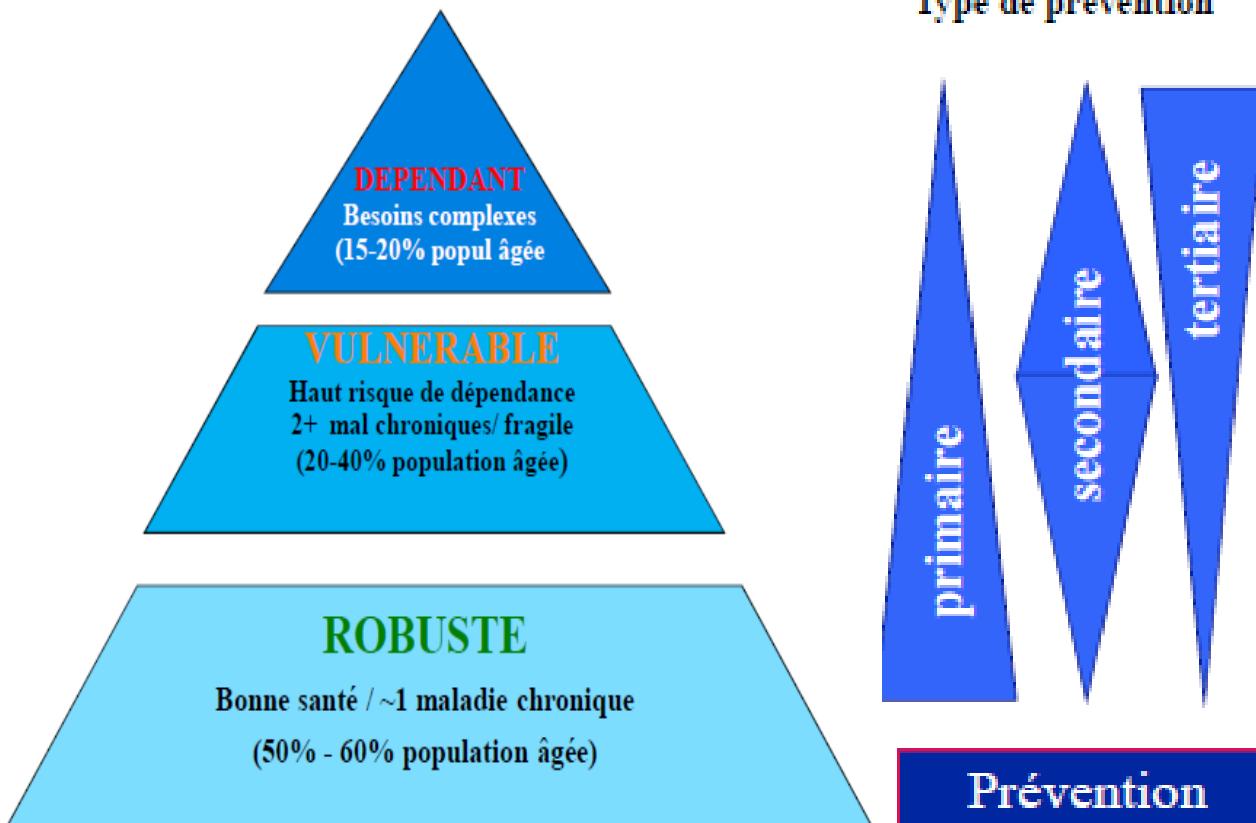


- **Demografischer Kontext**
- **Präventionsempfehlungen für Senioren und Seniorinnen**
- **Nutzen von Bewegung**
 - Mortalität
 - Funktionelle Leistungsfähigkeit
 - Chronische Krankheiten und Krebs
 - Kognitive Beeinträchtigung



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Heterogenität der älteren Bevölkerung und Prävention



La prévention primaire vise à empêcher l'apparition d'une maladie (ex : vaccination contre la grippe,...).

La prévention secondaire vise l'amélioration du pronostic des maladies par une prise en charge précoce, grâce à un examen prédiagnostique appliqué à des individus asymptomatiques (ex : dépistage,...).

La prévention tertiaire vise à empêcher les conséquences (invalidantes) des maladies (ex : prise en charge clinique, mesures de réadaptation).

Table 1

A guide to health promotion over the lifespan.

Aging successfully needs lifelong prevention strategies

Prior to birth	0–20 years	20–40 years	40–60 years	60–80 years	80+ years
Choose long-lived parents	Exercise regularly	Exercise regularly	Exercise regularly	Exercise regularly including balance and resistance exercises	Exercise regularly, including balance and resistance exercises
Do not be a small baby	Avoid obesity	Avoid obesity	Avoid obesity	Avoid weight loss	Avoid weight loss
Have your mother get regular check-ups during pregnancy	Ingest adequate calcium over puberty	Eat fish	Ingest adequate calcium (600–1000 mg/daily) and vitamin D	Ingest adequate calcium (600–1000 mg/daily) and vitamin D (1000 IU/daily)	Eat Mediterranean diet
Have your mother take pre-natal vitamins including folate	Wear your seatbelt	Wear your seatbelt	Wear your seatbelt	Wear your seatbelt	Wear your seatbelt
Have your mother not smoke or drink alcohol	Do not smoke or drink Eat nutritious foods	Drink in moderation and do not smoke Drive at a safe speed	Drink in moderation and do no smoke Have your blood pressure checked	Drink in moderation and do not smoke Screen for breast and colon cancer, high blood pressure, osteoporosis, and diabetes	Drink in moderation and do not smoke Check your blood pressure at home
Avoid violence and illicit drugs Get your vaccinations	Avoid violence and illicit drugs Check your breasts regularly (females)	Avoid violence and illicit drugs Check your breasts regularly (females)	Get your cholesterol and glucose checked Screen for breast and colon cancer, high blood pressure, and diabetes Have Pap smears (females)	Have flu/tetanus/pneumococcal vaccinations Eat fruits and vegetables and extra virgin olive oil (Mediterranean diet) Have Pap smears (females)	Have flu/tetanus/pneumococcal vaccinations Ingest adequate calcium and vitamin D or spend 30 min a day in sunlight Do monthly breast self-exams
Get sunlight (vitamin D)			Have regular mental activity and socialize! Avoid taking too many medicines Ingest between 3 to 6 g sodium a day	Have regular mental activity and socialize! Avoid taking too many medicines	Have regular mental activity, socialize, and avoid being depressed Avoid taking too many medicines
					Safety-proof your home to prevent falls. If you are unsteady, use a cane and consider hip protectors Be screened for osteoporosis Be involved in multidomain program for frailty/falls/sarcopenia/cognitive decline Keep doing what you are doing. Remember, most of your physicians won't reach your age!

Table 1

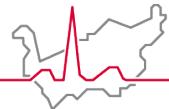
A guide to health promotion over the lifespan.

Prior to birth	0–20 years	20–40 years	40–60 years	60–80 years	80+ years
Choose long-lived parents	Exercise regularly	Exercise regularly	Exercise regularly	Exercise regularly including balance and resistance exercises Avoid weight loss	Exercise regularly, including balance and resistance exercises Avoid weight loss
Do not be a small baby	Avoid obesity	Avoid obesity	Avoid obesity	Ingest adequate calcium (600–1000 mg/daily) and vitamin D (1000 IU/daily)	Eat Mediterranean diet
Have your mother get regular check-ups during pregnancy	Ingest adequate calcium over puberty	Eat fish	Ingest adequate calcium (600–1000 mg/daily) and vitamin D (1000 IU/daily)	Wear your seatbelt	Wear your seatbelt
Have your mother take pre-natal vitamins including folate	Wear your seatbelt	Wear your seatbelt	Wear your seatbelt	Wear your seatbelt	Wear your seatbelt
Have your mother not smoke or drink alcohol	Do not smoke or drink Eat nutritious foods Avoid violence and illicit drugs Get your vaccinations Get sunlight (vitamin D)	Drink in moderation and do not smoke Drive at a safe speed Avoid violence and illicit drugs Check your breasts regularly (females) Have regular mental activity and socialize!	Drink in moderation and do no smoke Have your blood pressure checked Get your cholesterol and glucose checked Screen for breast and colon cancer, high blood pressure, osteoporosis, and diabetes Have flu/tetanus/pneumococcal vaccinations Eat fruits and vegetables and extra virgin olive oil (Mediterranean diet) Have Pap smears (females)	Drink in moderation and do not smoke Screen for breast and colon cancer, high blood pressure, osteoporosis, and diabetes Have flu/tetanus/pneumococcal vaccinations Ingest adequate calcium and vitamin D or spend 30 min a day in sunlight Have Pap smears (females) Have regular mental activity and socialize!	Drink in moderation and do not smoke Check your blood pressure at home Have flu/tetanus/pneumococcal vaccinations Ingest adequate calcium and vitamin D or spend 30 min a day in sunlight Do monthly breast self-exams Have regular mental activity, socialize, and avoid being depressed
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Übersicht

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- Nutzen von Bewegung
 - Mortalität
 - Funktionelle Leistungsfähigkeit
 - Chronische Krankheiten und Krebs
 - Kognitive Beeinträchtigung



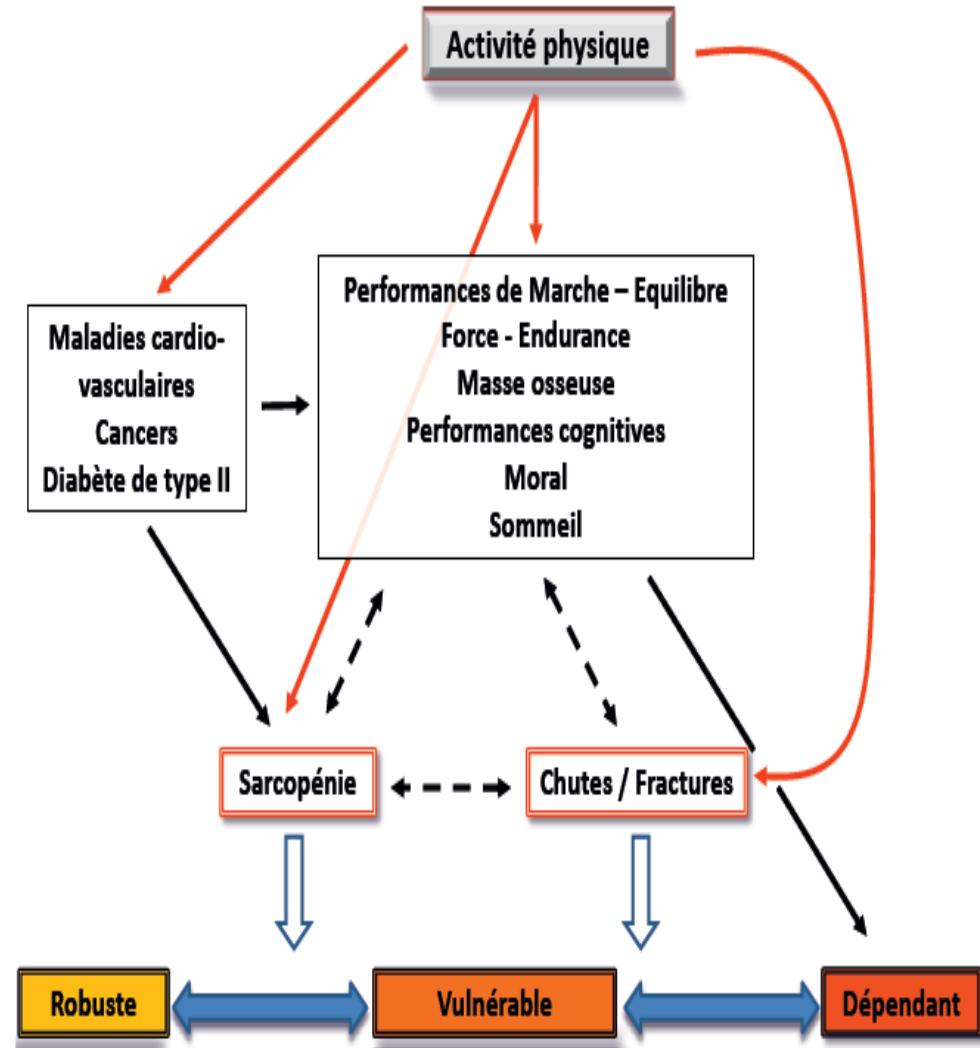
Nutzen von Bewegung für Senioren und Seniorinnen

Verbesserung der Mobilität und Verringerung des Risikos einer Behinderung

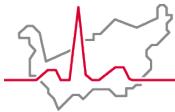
Verringerung des Risikos von Herz-Kreislauf-Erkrankungen, Hirnschlag, Bluthochdruck, Typ-2-Diabetes, Osteoporose, Adipositas, Dickdarmkrebs, Brustkrebs, Angststörungen, Depression, kognitiven Störungen

Weniger Stürze und sturzbedingte Verletzungen

Mögliche Reduzierung der Inzidenz und der Schwere von Funktionsstörungen



Seematter-Bagnoud L, et al. Rev Med Suisse, 2012.



Messung von Bewegung

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Metabolic Equivalent of Task

Marche : 2 METs
Course : 10 Km/h : 10 METs

- Cout de l'activité métabolique divisée par l'activité de base
 $3.5 \text{ ml O}_2 \text{ min}^{-1} \text{ kg}^{-1}$

Recommandations :

- 150' /sem intensité modérée (3-5.9 METs)

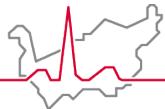
500-1000 METs-minutes
ou 10-15 METs-heure
par semaine

Table 1 | Definitions of sedentary behaviour and differing intensities of physical activity

Intensity	Examples	Energy expenditure (METs)	Accelerometer threshold (counts/min)[15]
Sedentary time	Sitting, lying down	1.0-1.5	<100
Light intensity	Standing, self care, household activities	1.6-2.9	100-1951
Moderate intensity	Brisk walking and equivalent	3.0-5.9	1952-5724
Vigorous intensity	Jogging, hard physical labour	≥ 6	≥ 5725

METs=metabolic equivalents (multiples of resting energy expenditure).

Physical activity, function, and longevity among the very old

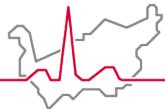


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Table 1. Baseline Characteristics at Ages 70, 78, and 85 Years^a

Variable	Phase I, Age 70 y (1990-1991) (n=457)		Phase II, Age 78 y (1997-1998) (n=894)		Phase III, Age 85 y (2005-2006) (n=1172)	
	PA	Sedentary	PA	Sedentary	PA	Sedentary
Total	244 (53.4)	213 (46.6)	688 (76.9)	206 (23.0)	750 (64.0)	422 (36.0)
Sex						
Men	140 (57.4)	110 (51.6)	384 (55.8)	57 (27.7)	376 (50.1)	152 (36.0)
Women	104 (42.6)	103 (48.4)	304 (44.2)	149 (72.3)	374 (50.0)	270 (64.0)
Ashkenazi	204 (82.9)	148 (69.5)	535 (77.8)	120 (58.2)	577 (78.0)	247 (60.1)
Educational level, mean (SD), y	13.2 (5)	11.4 (6)	12.2 (6)	8.5 (6)	12.3 (6)	9.4 (6)
Financial difficulties	68 (28.2)	90 (43.3)	203 (31.6)	88 (50.3)	186 (24.9)	184 (45.2)
Lonely	84 (35.2)	78 (37.9)	224 (34.6)	100 (60.6)	279 (37.4)	216 (56.1)
Depressed	23 (10.3)	42 (22.6)	97 (18.4)	34 (37.0)	211 (28.6)	194 (52.4)
Poor self-rated health status	32 (13.2)	95 (45.2)	231 (34.5)	142 (71.7)	192 (25.9)	207 (53.9)
MMSE score, mean (SD)	29 (3)	28.5 (3)	28.7 (2)	27.5 (3)	27.8 (3)	24.5 (7)
ADLs (Dependence)	4 (1.7)	19 (9.2)	28 (4.5)	69 (36.5)	137 (18.5)	296 (72.9)
ADLs (Difficulty)	66 (28.2)	103 (49.8)	267 (41.5)	140 (74.1)	607 (81.9)	381 (93.8)
BMI, ^b mean (SD)	26.8 (4)	27.6 (4)	27.3 (4)	29.3 (6)	27.2 (4)	27.5 (5)
Smoking pack-years, mean (SD)	14 (22)	16.4 (24)	19.6 (28)	14.5 (27)	10.8 (23)	6 (17)
Fracture in last 7 y ^c	55 (22.5)	40 (19.0)	71 (20.3)	41 (34.8)	67 (35.5)	62 (44.9)
Fall in last year	67 (27.5)	61 (28.8)	174 (26.2)	74 (39.6)	291 (39.0)	230 (55.6)
Chronic back/joint pain	143 (58.6)	132 (61.9)	503 (73.1)	169 (82.0)	387 (51.6)	266 (63.0)
Medication for hypertension	88 (35.8)	117 (54.9)	366 (53.0)	137 (66.5)	561 (74.8)	339 (80.3)
Medication for diabetes mellitus	12 (4.9)	22 (10.3)	67 (9.7)	27 (13.1)	94 (12.5)	101 (23.9)
Hypertension	74 (30.3)	105 (49.3)	352 (51.2)	134 (65.5)	533 (71.1)	308 (73.2)
Diabetes mellitus	33 (13.5)	39 (18.3)	120 (17.4)	45 (21.8)	131 (17.5)	119 (28.3)
Ischemic heart disease	57 (23.4)	61 (28.6)	226 (32.9)	78 (37.9)	281 (37.4)	156 (37.0)
Renal disease	1 (0.4)	3 (1.4)	12 (1.7)	5 (2.4)	59 (7.9)	47 (11.2)

Physical activity, function, and longevity among the very old



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* Initiating or continuing PA ($\geq 4\text{h/w}$) among the very old is associated with better survival and function

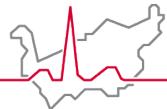
Table 2. Mortality From Any Cause According to PA

Age at Which PA Was Measured, y	Follow-up Period, Age Range, y	Hazard Ratio ^a (95% Confidence Interval)	
		Unadjusted	Adjusted
70	70-78	0.50 (0.30-0.76)	0.61 (0.38-0.96)
78	78-85	0.57 (0.44-0.74)	0.69 (0.48-0.98)
85	85-88	0.25 (0.18-0.35)	0.42 (0.25-0.68)
70-85 ^b	70-88	0.48 (0.37-0.64)	0.66 (0.46-0.95)

* The PA level at age 78 is associated with remaining independent while performing activities of daily living at age 85 !
(Odds ratio, 1.92 , CI, 1.11-1.33)

Stessman J, et al. Arch Intern Med 2009

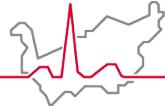
Low-dose of moderate-to-vigorous physical activity in adults aged ≥ 60 years



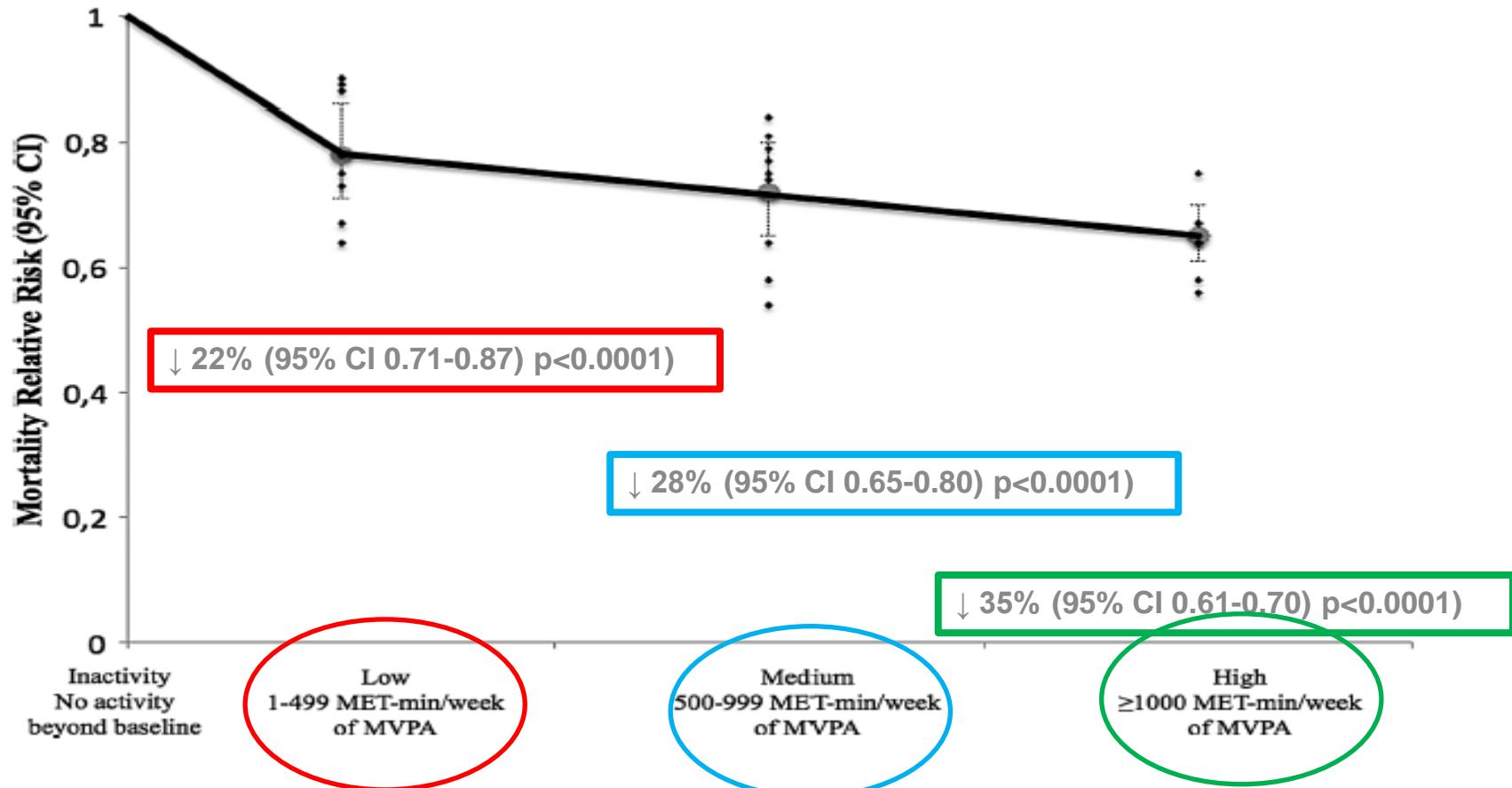
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- **Background:**
 - Current guidelines recommendations to gain substantial health benefits:
 $\geq 150'$ weekly of moderate-intensity physical activity,
or $75'$ weekly of vigorous-intensity physical activity
 - Dose not reached in older (to high?)
- **Meta-analysis of 9 cohort studies, with the objectives to assess the effects of lower-dose moderate-to-vigorous physical activity (MVPA) on all-cause mortality in 122 000 older adults (age ≥ 60 ; mean age, 73)**
- **Follow-up 10 years, 18 000 participants (15 %) died**
- **Weekly physical activity measured in Metabolic Equivalent of Task (MET) minutes**

Low-dose of moderate-to-vigorous physical activity in adults aged ≥ 60 years



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Hupin D, et al. Br J Sports Med 2015

The LIFE (Lifestyle Interventions and Independence for Elders) Study Randomized Clinical Trial

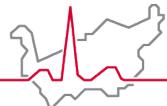


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Effect of Structured Physical Activity on Prevention of Major Mobility Disability in Older Adults

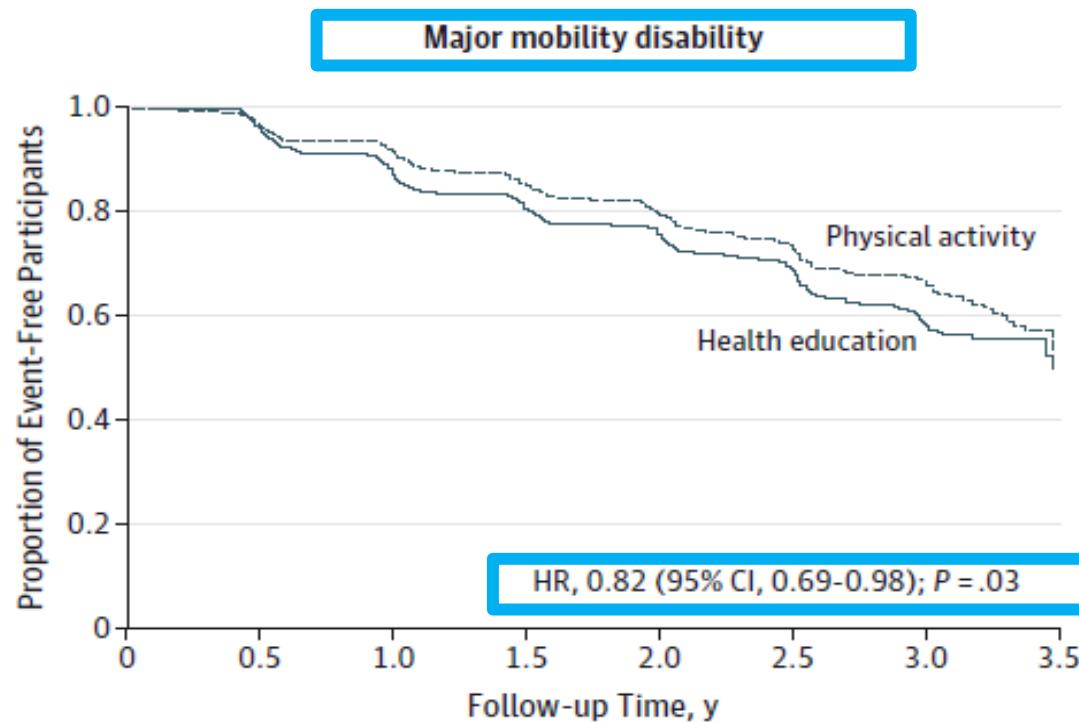
- 1635 community-living participants, aged 70-89 years, mean age 78.9
- No cognitive impairment
- Follow-up 2.6 years
- Sedentary, at risk for mobility disability but able to walk 400m
- **Interventions:**
 - a structured class (2 times/wk) and home (3-4 times/wk) **exercise program** (walking, resistance training and flexibility exercises) n=818
 - Weekly **health education** sessions n=817
- **Main outcomes and measures:** major mobility disability objectively defined by loss of ability to walk 400m within 15'

The LIFE (Lifestyle Interventions and Independence for Elders) Study Randomized Clinical Trial



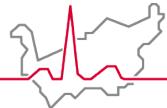
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Effect of a Moderate Physical Activity Intervention on the Onset of Major Mobility Disability



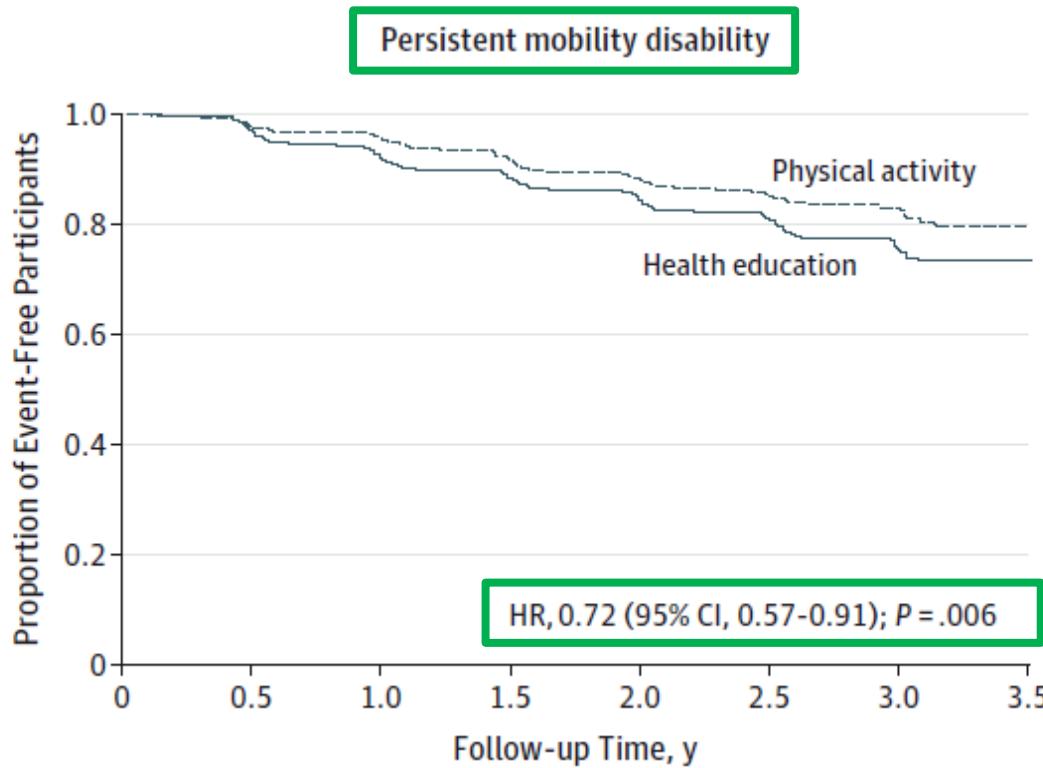
Pahor M, et al. JAMA 2014

The LIFE (Lifestyle Interventions and Independence for Elders) Study Randomized Clinical Trial



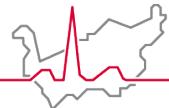
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Effect of a Moderate Physical Activity Intervention on the Onset of Major Mobility Disability and Persistent Mobility Disability

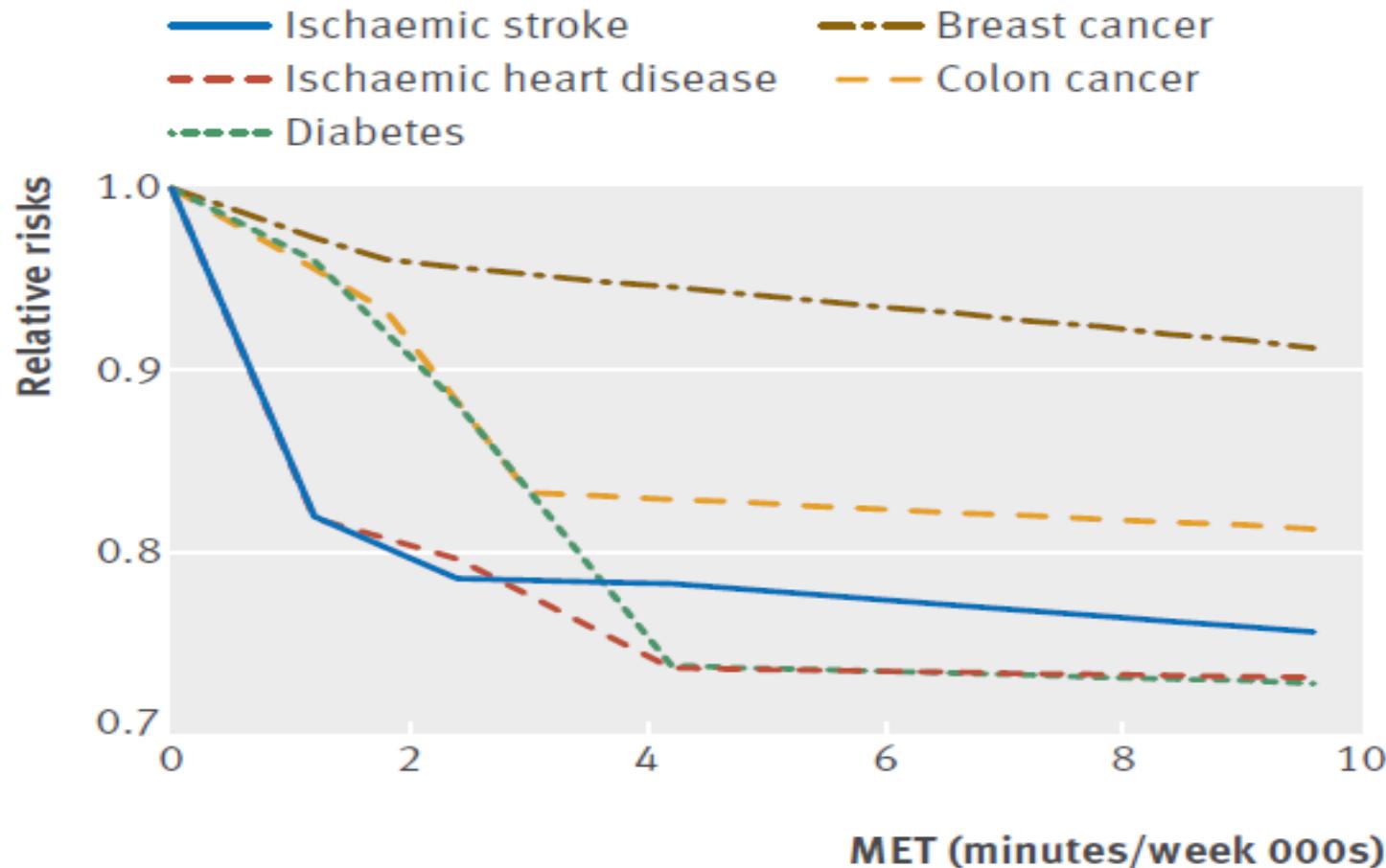


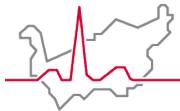
Pahor M, et al. JAMA 2014

Physical activity and risk of breast cancer, colon cancer, ischemic heart disease and ischemic stroke events



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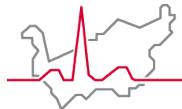
Fall Prevention

in older people living in the community

- 159 trials with 79,193 participants.
- Most trials compared a fall prevention intervention with no intervention or an intervention not expected to reduce falls.
- The most common interventions tested were exercise as a single intervention (59 trials) and multifactorial programmes (40 trials).

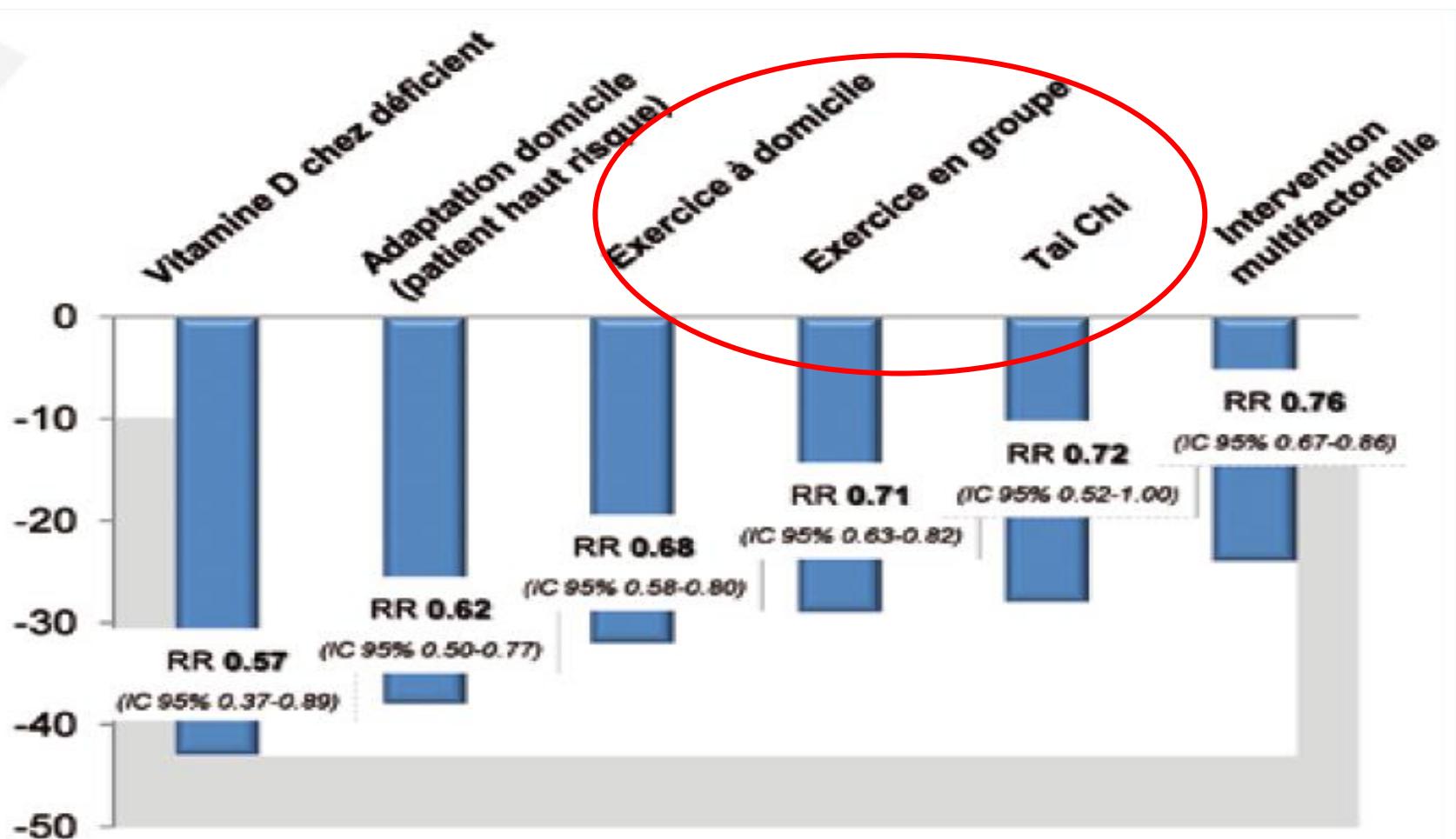


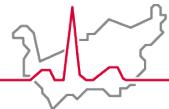
THE COCHRANE
COLLABORATION®



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Fall Prevention in Community-Dwelling older adults





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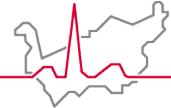
Übersicht

- „Aber ja – ich laufe immer noch den Mädchen hinterher – ich erinnere mich blos nicht mehr, wieso...“



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 - **Kognitive Beeinträchtigung**

Physical activity and cognition

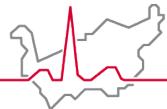


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**BEOBACHTUNGS-
STUDIEN**

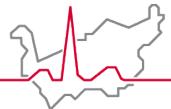
Exercice is associated with reduced risk for incident dementia among persons 65 years of age and older



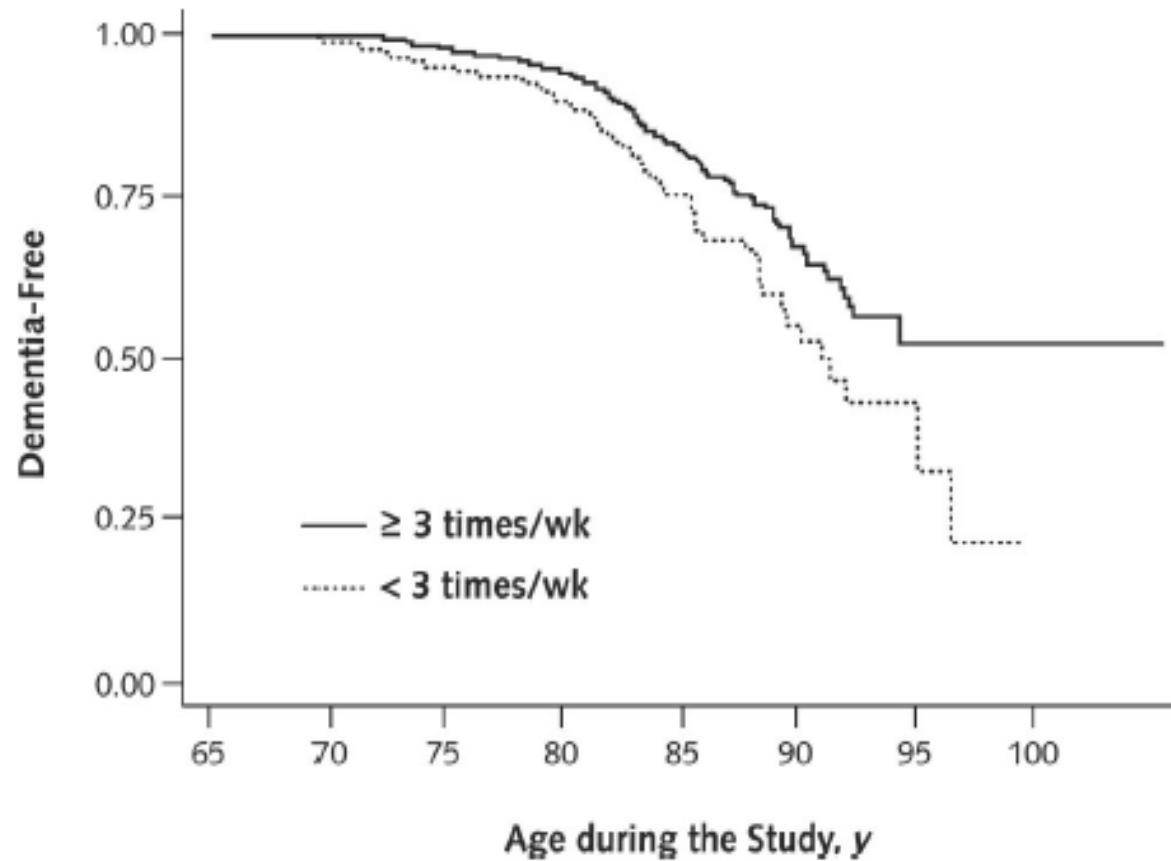
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- **Objective:** to determine whether regular exercise is associated with a reduced risk for dementia and Alzheimer disease
- **Design:** prospective cohort study
- **Participants:** 1740 older than 65 years (74.5 +/- 5.7) **without cognitive impairment**
- **Follow-up:** 6.2 years
- **Measurements:** exercise frequency < 3times/week or \geq 3times/week ($\geq 15'$)

Kaplan-Meier survival estimates for the probabilities of being dementia-free



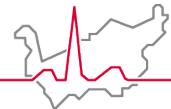
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HR 0.62 (95 % CI: 0.44-0.86; P=0.004)

Larson EB, et al. Ann Intern Med 2006

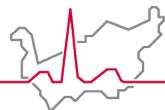
Physical activity and risk of cognitive decline: a meta-analysis of prospective studies



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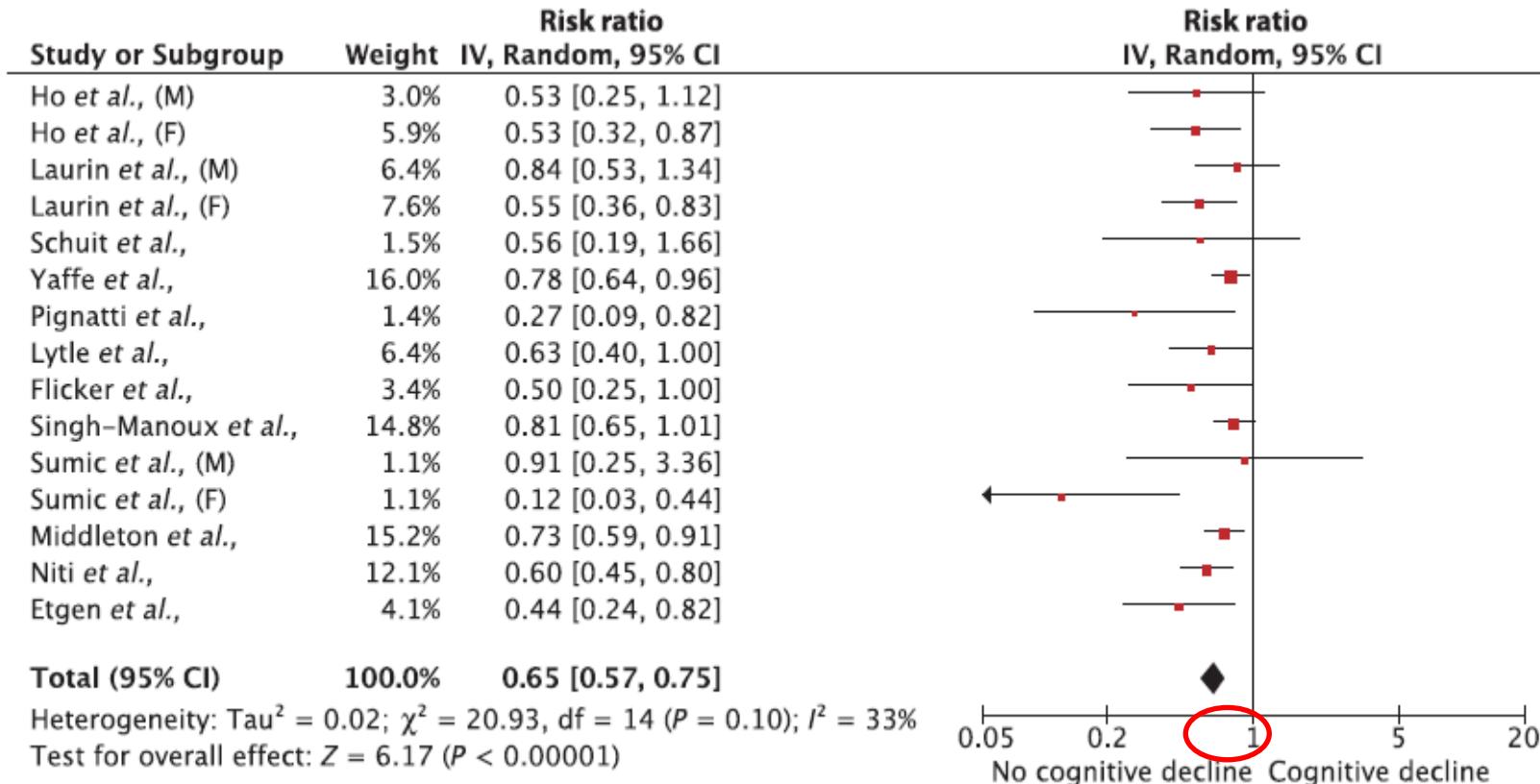
- 15 prospective studies included
- 33 816 **nondemented** subjects, followed for 1-12 years
- Primary or secondary outcome: association between physical activity and cognitive decline
- 3210 patients showed cognitive decline during follow-up

Physical activity and risk of cognitive decline: a meta-analysis of prospective studies



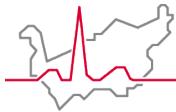
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Studies investigating a low-to-moderate level of physical activity



**Significant protection ($\downarrow 35\%$) against cognitive decline
(HR 0.65, 95%CI 0.57-0.75; $p < 0.00001$)**

Sofi F, et al. Journal of Internal Medicine, 2011

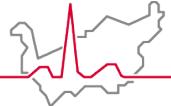


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Physical activity and cognition



Aerobic Exercise in older people without known cognitive impairment



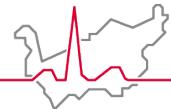
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THE COCHRANE
COLLABORATION®

- **Objectives:** effect of aerobic physical activity on cognitive function in cognitively healthy older adults
- **Review:** meta-analysis of 12 RCT, 754 participants, duration of studies between 8-26 weeks
- Cognitives outcomes measures groupes into 11 categories covering attention, memory, perception, executive functions, cognitive inhibition, cognitive speed and motor function.
- **Results:**
 - **No evidence of benefit from aerobic exercise in any cognitive domain!**

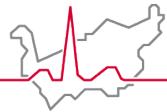
Finish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER)



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- A 2 year multidomain intervention of diet, exercise, cognitive training, and vascular risk monitoring vs control
- Double-blind randomised controlled trial
 - 1260 individuals,
 - Age 60-77 years
 - Cognitive score slightly lower than expected for age
- Interventions group:
 - Individual and group sessions for
 - dietary counseling (3x individual and 9x group sessions)
 - cognitive training (144x individual and 10 x group)
 - supervised aerobic (2-5x/week) and muscle-strengthening exercises(1-3x/week)
 - regular monitoring of vascular risk factors
- Control group: general health advice
- Primary outcome: change in cognitive performance measured with neuropsychological test battery (NTB) Z score

Risk of cognitive decline from baseline to 24 months (FINGER)

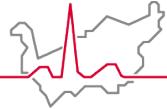


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	Odds ratio (95% CI)		p value
	Intervention (n=554)	Control (n=565)	
Overall cognitive decline			
NTB total score	1 (reference)	1.31 (1.01-1.71)	0.04
Cognitive decline per domain			
NTB memory score	1 (reference)	1.23 (0.95-1.60)	0.12
NTB executive functioning score	1 (reference)	1.29 (1.02-1.64)	0.04
NTB processing speed score	1 (reference)	1.35 (1.06-1.71)	0.01

In post-hoc analyses, we defined cognitive decline as decrease in NTB total score (overall decline) and NTB domain scores (decline per domain) between the assessments at baseline and at 24 months. Logistic regression analyses were used to assess risk of cognitive decline in the control group compared with the intervention group. Analyses are based on all participants with data available at both baseline and 24 months. NTB=neuropsychological test battery.

Table 2: Risk of cognitive decline from baseline to 24 months

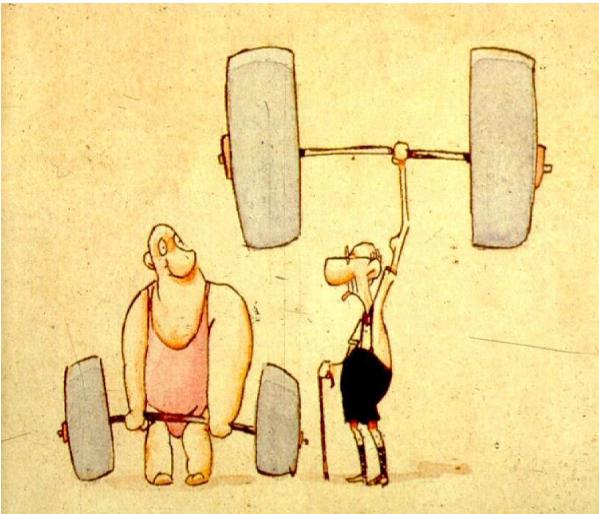


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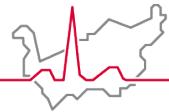
Take Home Message



- **Präventionsmassnahmen bei Senioren und Seniorinnen haben sich als nützlich erwiesen, vor allem:**
 - Bewegung
 - ausgewogene Ernährung
 - aktualisierter Impfstatus
 - geringer Alkoholkonsum
 - Rauchstopp



- **Kein Medikament beeinflusst die Alterung dermassen positiv wie Bewegung**



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„Ich bleibe ein angefressener Jogger...“



Danke für Ihre Aufmerksamkeit