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Spital Wallis

Prévention et Promotion de la Santé en Gériatrie

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Sommaire

- **Contexte démographique**
- **Recommandations pour la prévention chez les seniors**
- **Bénéfices de l'activité physique**
  - Mortalité
  - Performance fonctionnelle
  - Maladies chroniques et cancers
  - Déclin cognitif

Hétérogénéité de la population âgée et prévention

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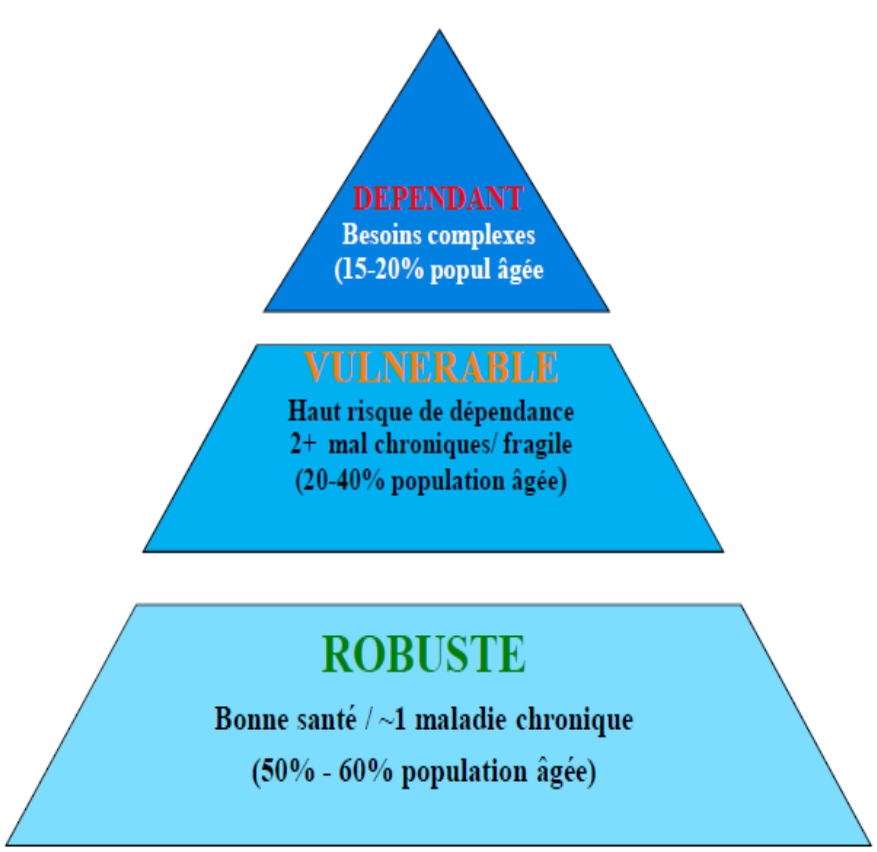

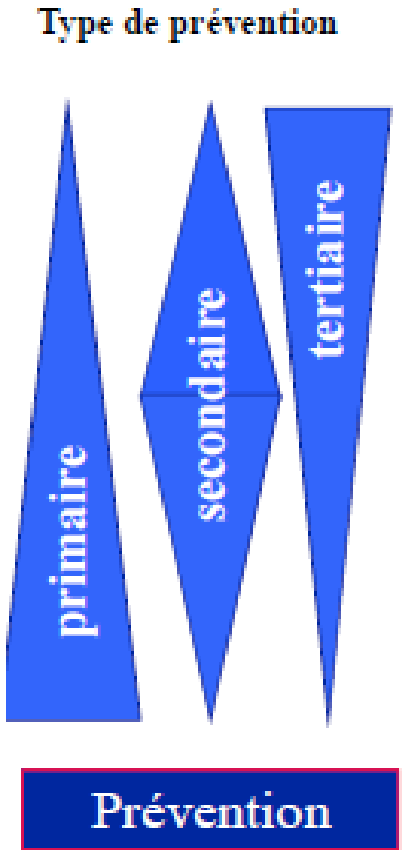

La prévention primaire vise à empêcher l'apparition d'une maladie (ex : vaccination contre la grippe,…).
La prévention secondaire vise l'amélioration du pronostic des maladies par une prise en charge précoce, grâce à un examen prédiagnostique appliqué à des individus asymptomatiques
(ex : dépistage,…).
La prévention tertiaire vise à empêcher les conséquences (invalidantes) des maladies
(ex : prise en charge clinique, mesures de réadaptation).

Aging succesfully needs lifelong prevention strategies

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	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	Drink in moderation and do not smoke	Drink in moderation and do no smoke	Drink in moderation and do not smoke	Drink in moderation and do not smoke
	Eat nutritious foods	Drive at a safe speed	Have your blood pressure checked	Screen for breast and colon cancer, high blood pressure, osteoporosis, and diabetes	Check your blood pressure at home
	Avoid violence and illicit drugs	Avoid violence and illicit drugs	Get your cholesterol and glucose checked	Have flu/tetanus/ pneumococcal vaccinations	Have flu/tetanus/pneumococcal vaccinations
	Get your vaccinations	Check your breasts regularly (females)	Screen for breast and colon cancer, high blood pressure, and diabetes	Eat fruits and vegetables and extra virgin olive oil (Mediterranean diet)	Ingest adequate calcium and vitamin D or spend 30 min a day in sunlight
	Get sunlight (vitamin D)		Have Pap smears (females)	Have Pap smears (females)	Do monthly breast self-exams
			Have regular mental activity and socialize!	Have regular mental activity and socialize!	Have regular mental activity, socialize, and avoid being depressed
			Avoid taking too many medicines	Avoid taking too many medicines	Avoid taking too many medicines
			Ingest between 3 to 6 g sodium a day		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!

Morley JE. European Geriatric Medicine 2016;7:285-88

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Benefices de l'exercice physique chez le senior

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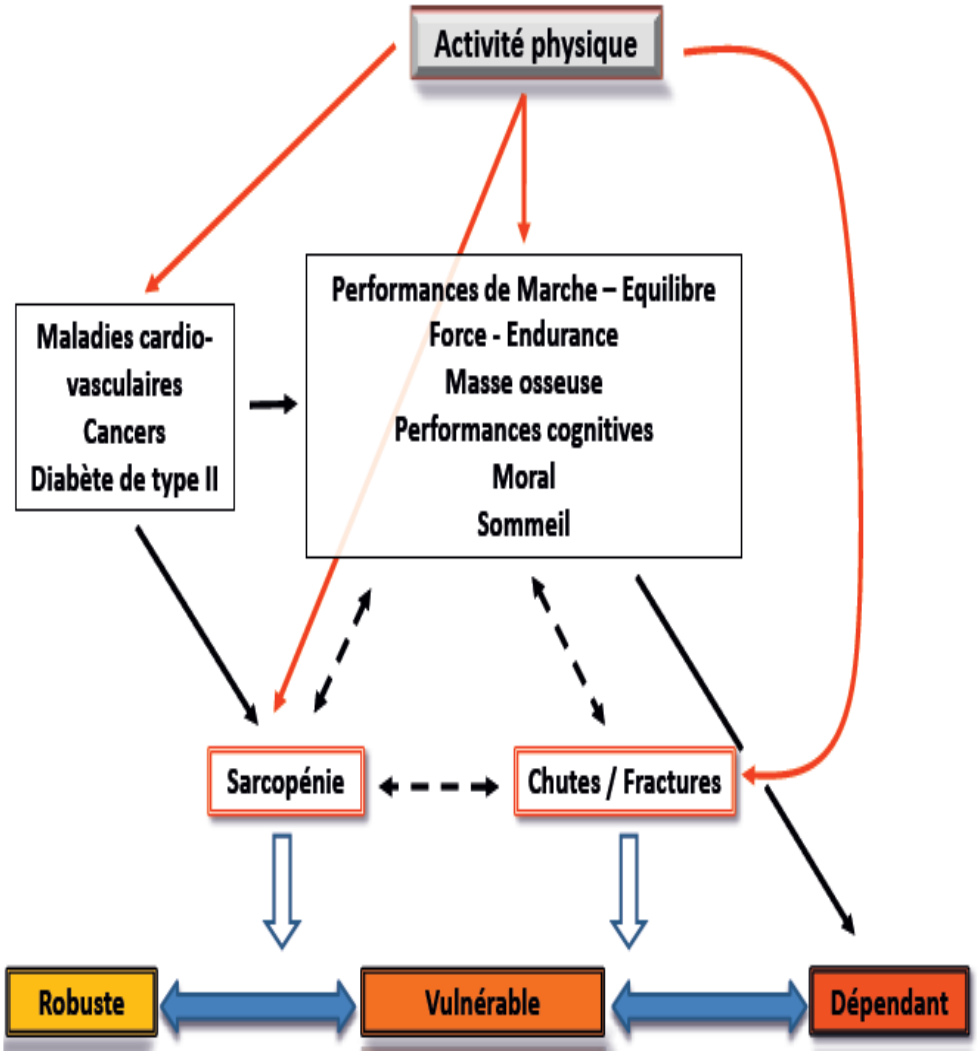
Amélioration de la mobilité et du risque d'handicap

Réduction du risque de maladie cardiovasculaire, AVC, hypertension, diabète type 2, osteoporose, obèsité, cancer du colon, cancer du sein, anxiété, dépression, troubles cognitifs

Diminution des chutes et des blessures liées aux chutes

Possible réduction de l'incidence et de la sévérité des limitations fonctionnelles



www. UPTODATE 2016, accessed March 10, 2016

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

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Mesure de l'activité physique

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 ml O_2 min^{-1} 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).

Sparling PB, et al. BMJ 2015

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)

Stessman J, et al. Arch Intern Med 2009

Physical activity, function, and longevity among the very old

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*** Initiating or continuing PA (≥ 4h/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:
    ≥ 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 0000 participants (15 %) died**

- **Weekly physical activity measured in Metabolic Equivalent of Task (MET) minutes**

Hupin D, et al. BrJ Sports Med 2015

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

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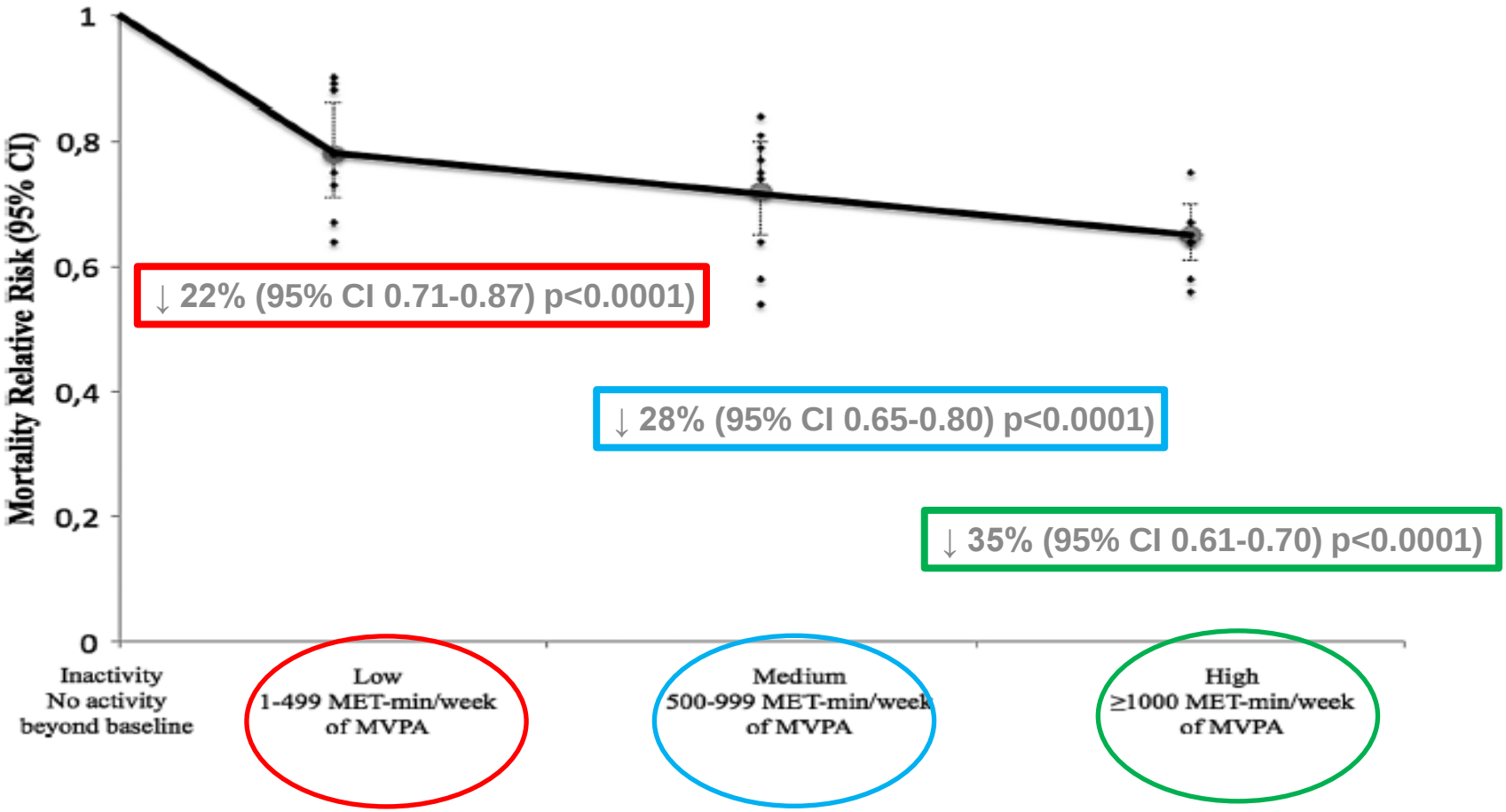

Hupin D, et al. Br J Sports Med 2015

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**
- **<u>Interventions:</u>**
  - a structured class (2 times/wk) and home (3-4 times/wk) **exercice program** (walking, resistance training and flexibility exercices) n=818
  - Weekly **health education** sessions n=817
- **<u>Main outcomes and measures:</u> major mobility disability objectively defined by loss of ability to walk 400m within 15'**

Pahor M, et al. JAMA 2014

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

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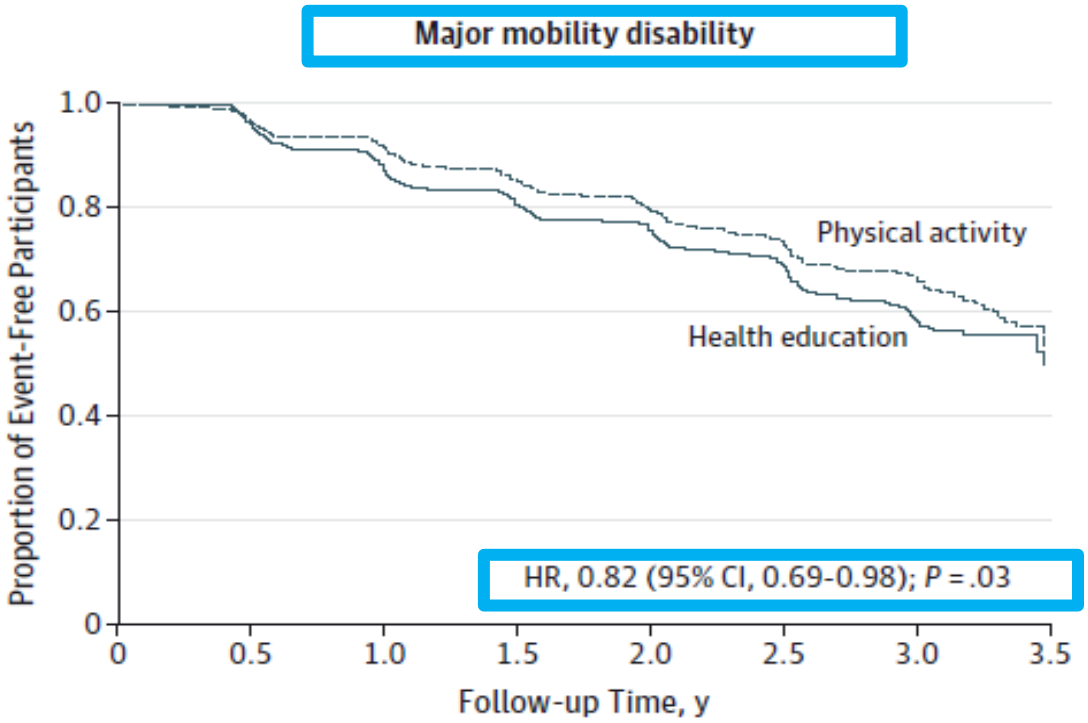
Effect of a Moderate Physical Activity Intervention on the Onset of Major Mobility Disability



Pahor M, et al. JAMA 2014

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

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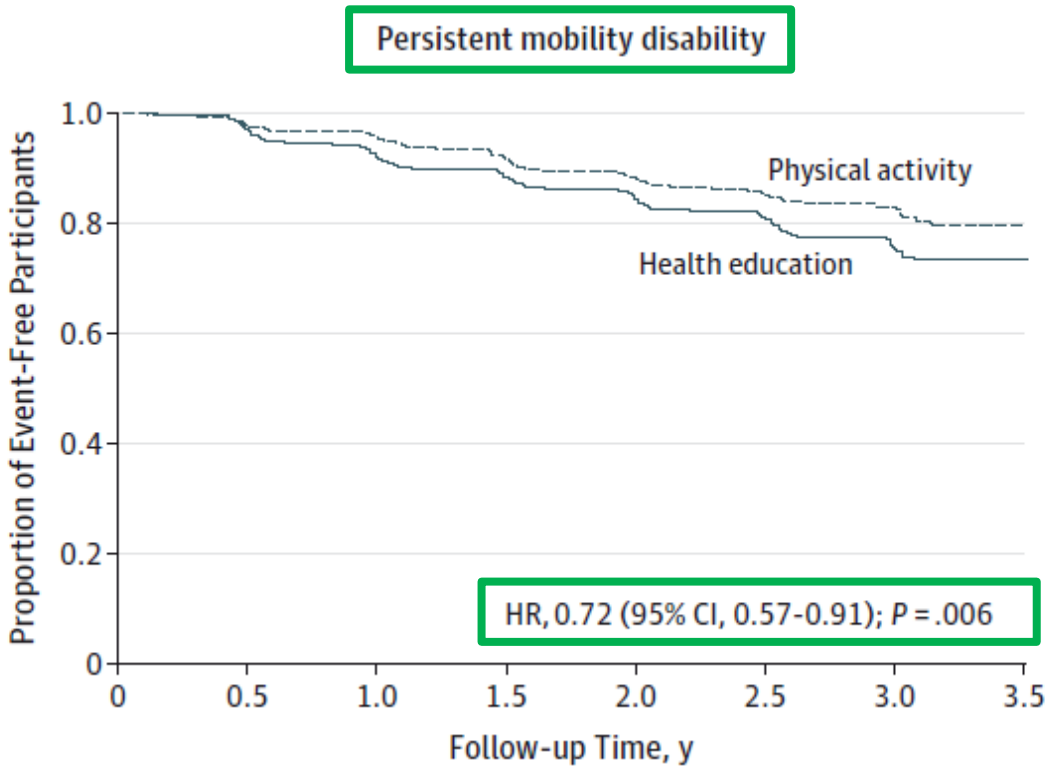
Effect of a Moderate Physical Activity Intervention on the Onset of Major Mobility Disability and Persistent Mobility Disability



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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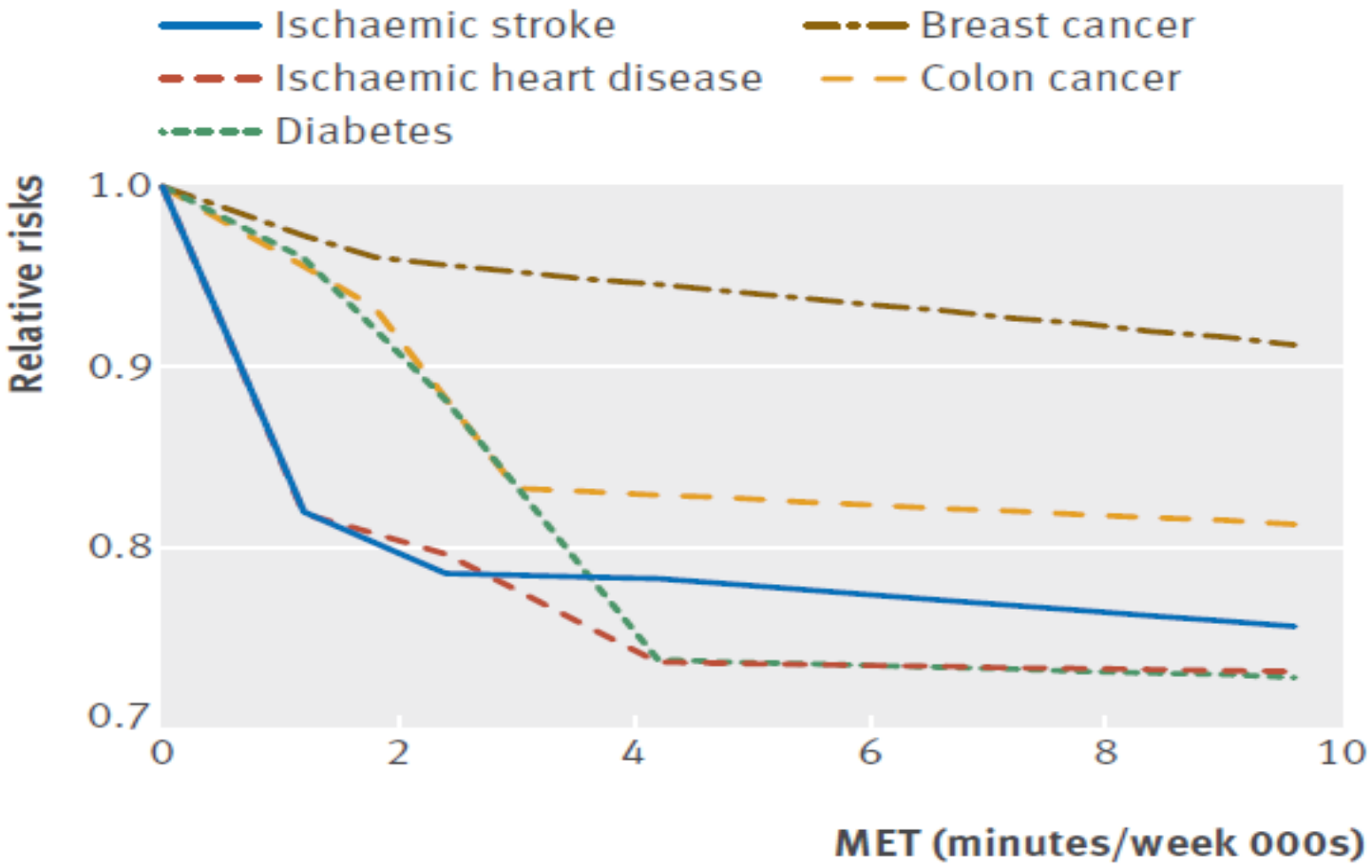

Kyu HH, et al. BMJ 2016

Fall Prevention

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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®

Gillepsie L, et al. Cochrane Database Syst Rev 4, 2015

Fall Prevention in Community-Dwelling olders adults

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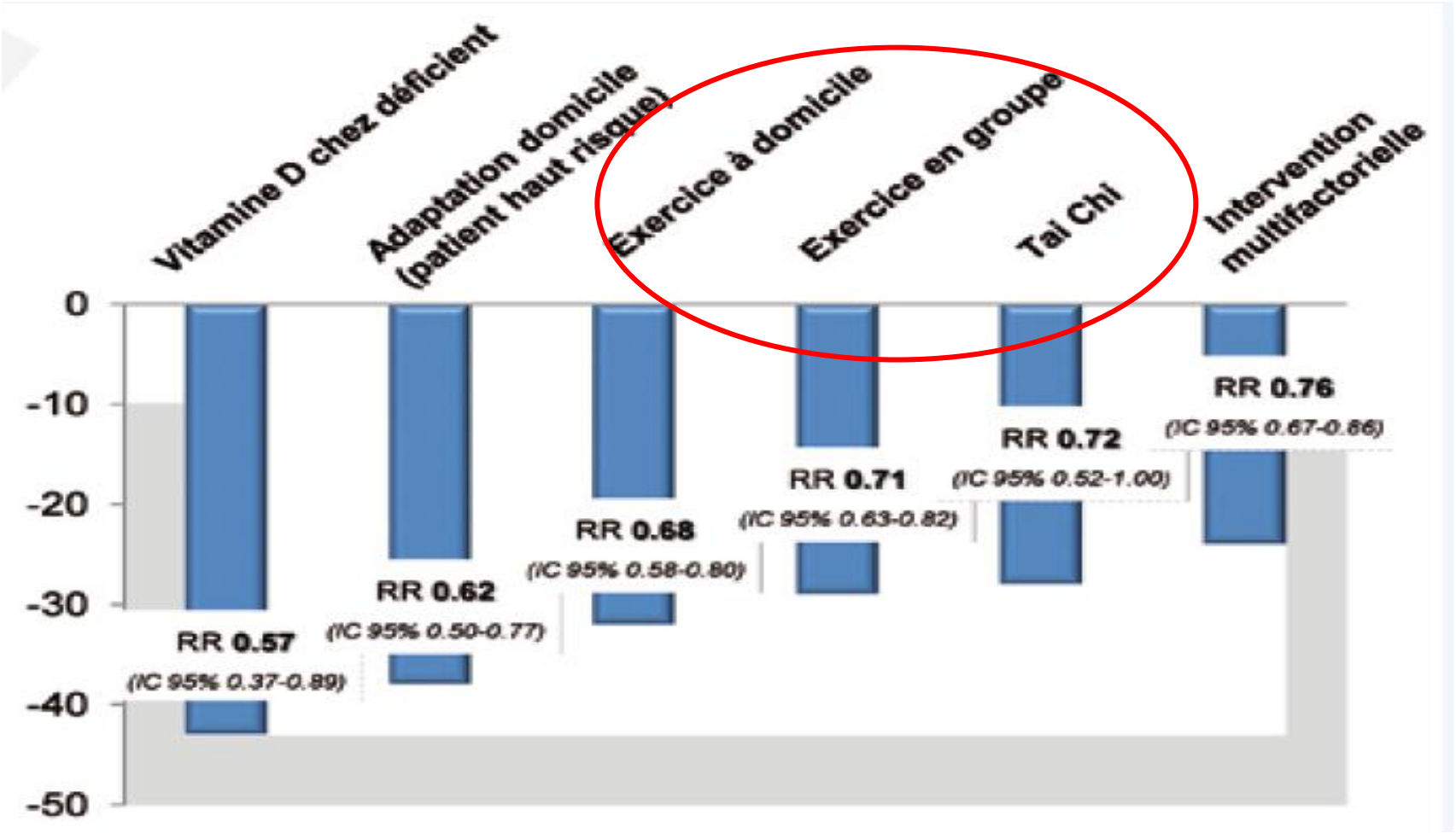

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Physical activity and cognition

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ETUDES OBSERVATIONNELLES

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 exercice 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: exercice frequency < 3times/week or ≥ 3times/week (≥15')**

Larson EB, et al. Ann Intern Med 2006

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

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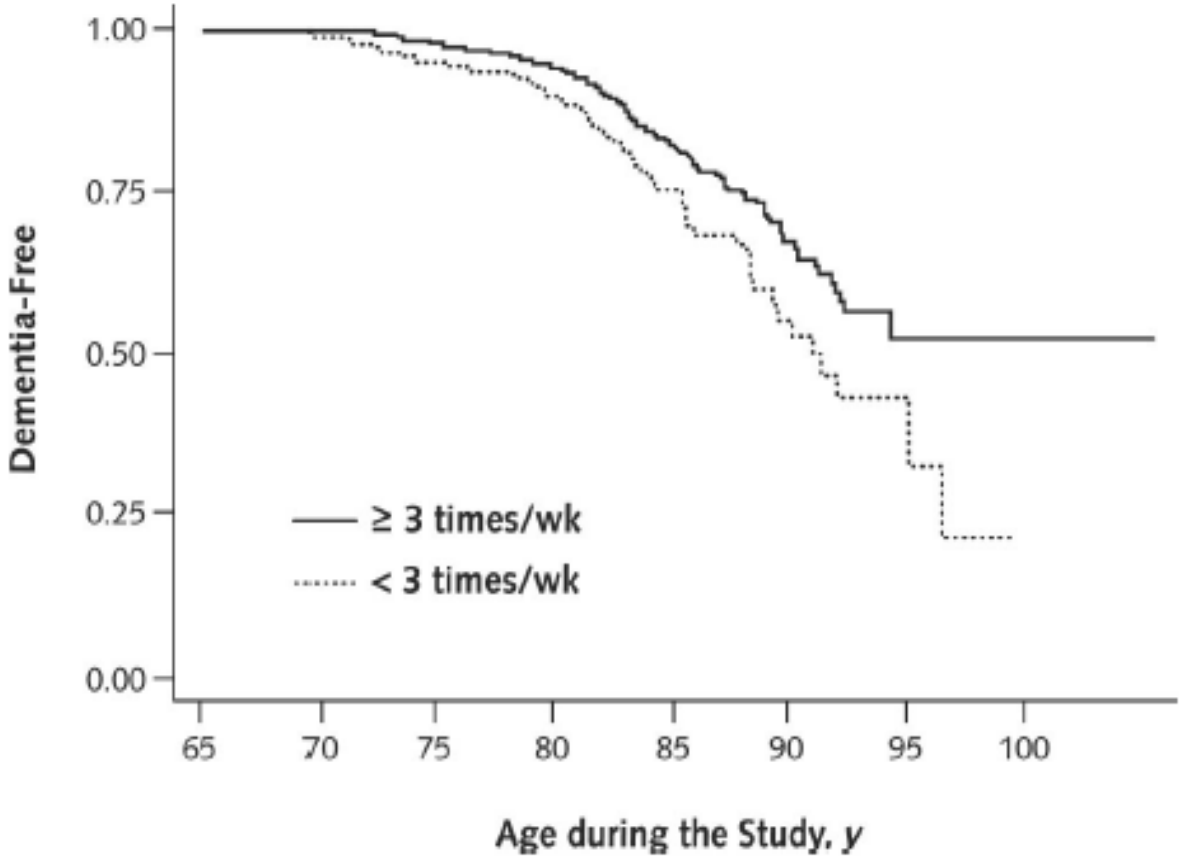

HR 0.62 (95 % CI: 0.44-0.86; P=0.004)

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 ou secondary outcome: association between physical activity and cognitive decline**
- **3210 patients showed cognitive decline during follow-up**

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

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

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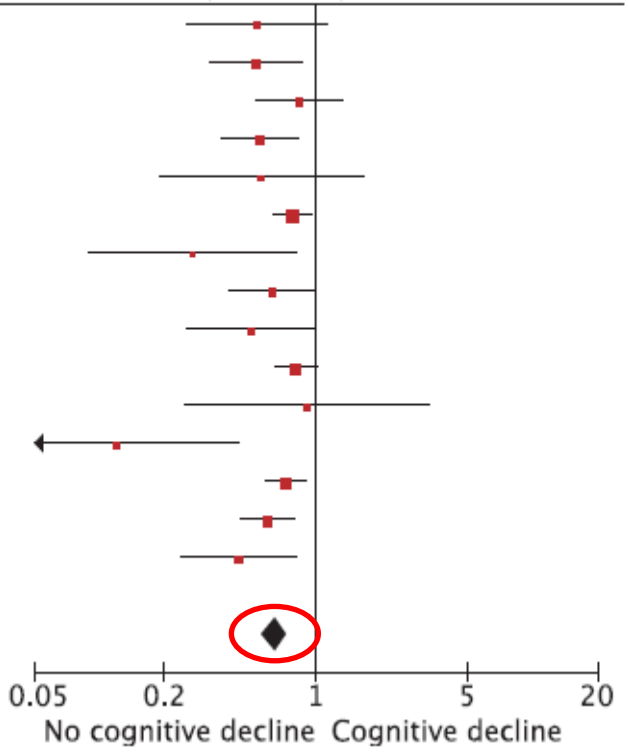
Studies investigating a low-to-moderate level of physical activity

Study or Subgroup	Weight	Risk ratio IV, Random, 95% CI
Ho *et al.*, (M)	3.0%	0.53 [0.25, 1.12]
Ho *et al.*, (F)	5.9%	0.53 [0.32, 0.87]
Laurin *et al.*, (M)	6.4%	0.84 [0.53, 1.34]
Laurin *et al.*, (F)	7.6%	0.55 [0.36, 0.83]
Schuit *et al.*,	1.5%	0.56 [0.19, 1.66]
Yaffe *et al.*,	16.0%	0.78 [0.64, 0.96]
Pignatti *et al.*,	1.4%	0.27 [0.09, 0.82]
Lytle *et al.*,	6.4%	0.63 [0.40, 1.00]
Flicker *et al.*,	3.4%	0.50 [0.25, 1.00]
Singh-Manoux *et al.*,	14.8%	0.81 [0.65, 1.01]
Sumic *et al.*, (M)	1.1%	0.91 [0.25, 3.36]
Sumic *et al.*, (F)	1.1%	0.12 [0.03, 0.44]
Middleton *et al.*,	15.2%	0.73 [0.59, 0.91]
Niti *et al.*,	12.1%	0.60 [0.45, 0.80]
Etgen *et al.*,	4.1%	0.44 [0.24, 0.82]
Total (95% CI)	**100.0%**	**0.65 [0.57, 0.75]**

Heterogeneity: $Tau^2 = 0.02$; $\chi^2 = 20.93$, df = 14 ($P = 0.10$); $I^2 = 33\%$
Test for overall effect: $Z = 6.17$ ($P < 0.00001$)



Significant protection (↓35 %) against cognitive decline (HR0.65, 95%CI0.57-0.75;p<0.00001)

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

Physical activity and cognition

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ETUDES
INTERVENTIONNELLES

Aerobic Exercice in older people without known cognitive impairment

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THE COCHRANE COLLABORATION®

- **<u>Objectives</u>: effect of aerobic physical activity on cognitive function in cognitively healthy older adults**

- **<u>Review</u>:** 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.
- **<u>Results</u>:**
  - **No evidence of benefit from aerobic exercice in any cognitive domain!**

Young J, et al. Cochrane Database Syst Rev 2015;4:CD005381

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

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- **A 2 year multidomain intervention of diet, exercice, cognitive training, and vascular risk monitoring vs control**

- **Double-blind randomised controlled trial**
  - 1260 individuals,
  - Age 60-77 years
  - Cognitive score slighty lower than expected for age

- **<u>Interventions group</u>:**
  - 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 exercices(1-3x/week)
    - regular monitoring of vascular risk factors

- **<u>Control group</u>: general health advice**

- **<u>Primary outcome</u>: change in cognitive performance measured with neuropsychological test battery (NTB) Z score**

Ngandu T, et al. Lancet 2015

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

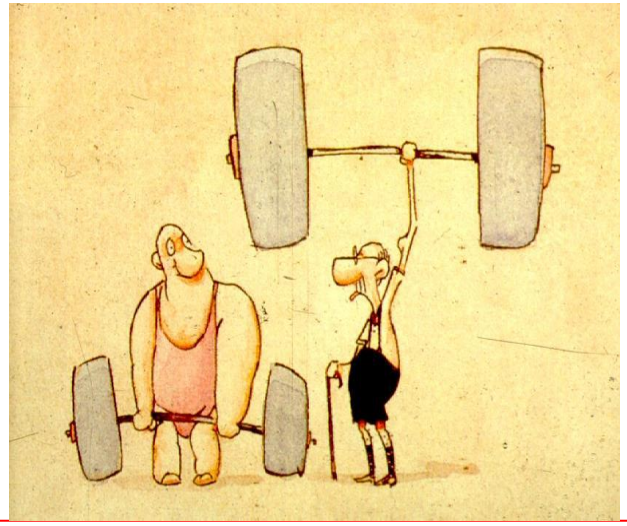
In post-hoc analyses, we defined cognitive decline as decrease in NTB total score (overall decline) and NTB domain scores (decline per domain) between the assessments at baseline and at 24 months. Logistic regression analyses were used to assess risk of cognitive decline in the control group compared 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

Ngandu T, et al. Lancet 2015

Take Home Message

- **Les mesures de prévention sont utiles chez les personnes âgées, en particulier**
  - l'exercice physique,
  - une alimentation équilibrée,
  - un status vaccinal à jour,
  - une faible consommation d'alcool
  - l'arrêt du tabac



- **Aucun médicament n'a autant de bénéfices sur le vieillissement que l'activité physique**

Merci de votre attention !