Hôpital du Valais
Spital Wallis

# Prévention et Seniors

# les Facteurs Clés

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**Médecin-chef de service**
**Centre Hospitalier du Valais Romand**

# Sommaire

- **Recommandations pour la prévention chez les seniors**
- **Bénéfices de l'activité physique**
  - Longévité et performance fonctionnelle
  - Cancers
  - Prévention de la chute
  - Déclin cognitif
- **Dépistage**
- **Vaccinations**
- **Vitamine D**

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## Aging succesfully needs lifelong prevention strategies

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| | 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<br>Ingest between 3 to 6 g sodium a day | Avoid taking too many medicines | Avoid taking too many medicines<br>Safety-proof your home to prevent falls. If you are unsteady, use a cane and consider hip protectors<br>Be screened for osteoporosis<br>Be involved in multidomain program for frailty/falls/ sarcopenia/cognitive decline<br>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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# Health benefits associated with regular physical activity

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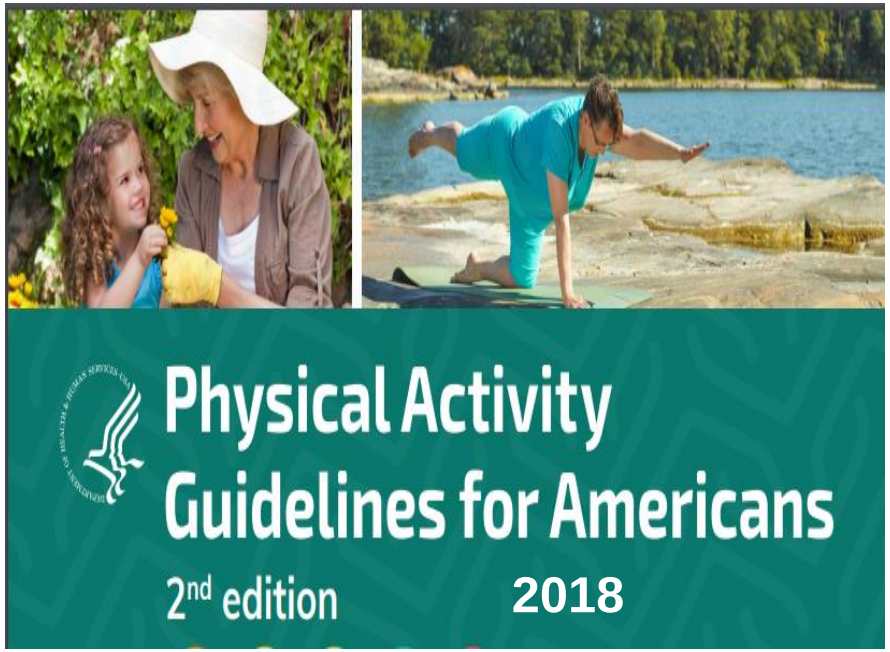


**Adults and Older Adults**

- Lower risk of all-cause mortality
- Lower risk of cardiovascular disease mortality
- Lower risk of cardiovascular disease (including heart disease and stroke)
- Lower risk of hypertension
- Lower risk of type 2 diabetes
- Lower risk of adverse blood lipid profile
- Lower risk of cancers of the bladder, breast, colon, endometrium, esophagus, kidney, lung, and stomach
- Improved cognition*
- Reduced risk of dementia (including Alzheimer's disease)
- Improved quality of life
- Reduced anxiety
- Reduced risk of depression
- Improved sleep
- Slowed or reduced weight gain
- Weight loss, particularly when combined with reduced calorie intake
- Prevention of weight regain following initial weight loss
- Improved bone health
- Improved physical function
- Lower risk of falls (older adults)
- Lower risk of fall-related injuries (older adults)

www.health.gov/paguidelines, accessed May 24, 2019

# Mesure de l'activité physique

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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 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***

| Intensité | Exemples | Dépense d'énergie (METs) |
|---|---|---|
| Sédentaire | Assis, couché | 1,0-1,5 |
| légère | Debout, toilette, ménage | 1,6-2,9 |
| modérée | Marche rapide | 3,0-5,9 |
| vigoureuse | Jogging, travail physique dur | ≥ 6 |

# Correspondance en MET de différentes activités physiques

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| AP faible | MET | AP modérée | MET | AP élevée | MET |
|---|---|---|---|---|---|
| Effort faible, qui accélère peu la fréquence cardiaque | < 3 | Effort moyen, qui accélère sensiblement la fréquence cardiaque | 3-6 | Effort important, qui accélère considérablement la fréquence cardiaque | > 6 |
| | | **Marche, course** | | | |
| Marche* lente (supermarché, lieu de travail) | 2 | Marche* d'un pas vif | 5 | • Marche* à un rythme très rapide<br>• Marche/randonnée à un rythme modéré avec ou non charge légère<br>• Randonnée de niveau élevé et avec charge<br>• Jogging | 6<br>7<br><br>7,5-9<br>8-11,5 |
| | | **Tâches domestiques** | | | |
| • Utilisation de l'ordinateur et d'outils légers<br>• Faire le lit, faire la vaisselle, repasser, préparer le repas, ranger les courses<br>• Ecrire | 1,5<br>2,0-2,5<br><br>1,8 | • Nettoyage important: laver les vitres, la voiture, le garage<br>• Brosser les sols ou le tapis, passer l'aspirateur,<br>• Petits travaux de menuiserie<br>• Porter et ranger le bois<br>• Tondre la pelouse | 3<br><br>3-3,5<br><br>3,6<br>5,5<br>5,5 | • Pelleter du sable, du charbon<br>• Porter de lourdes charges telles que des briques<br>• Lourds travaux des champs tels que faire les foins<br>• Creuser des fossés | 7<br>7,5<br><br>8<br><br>8,5 |
| | | **Activités de loisir et sports** | | | |
| • Jouer aux cartes<br>• Jouer au billard<br>• Jouer aux fléchettes<br>• Pêcher<br>• Jouer de la plupart des instruments de musique<br>• Stretching, yoga<br>• Bowling<br>• Activité sexuelle<br>• Regarder la télévision | 1,5<br>2,5<br>2,5<br>2,5<br>2,0-2,5<br><br>2,5<br>2<br>2,5-3<br>1 | • Badminton de loisir<br>• Basketball – Déplacement rapide<br>• Vélo d'appartement à petite vitesse<br>• Danse – lente<br>• Danse – rapide<br>• Pêcher tout en marchant sur la rive<br>• Golf<br>• Bateau à voile, surf<br>• Nage de loisir<br>• Tennis de table<br>• Tennis en double<br>• Volleyball hors compétition | 4,5<br>4,5<br>6<br>3<br>4,5<br>4<br>4,3<br>3<br>6<br>4<br>5<br>3-4 | • Partie de basketball<br>• Vélo d'appartement: effort modéré/effort rapide<br>• Ski de fond lent/rapide<br>• Football amateur/compétition<br>• Natation: effort modéré/fort<br>• Tennis en simple<br>• Volleyball en compétition | 8<br>8/10<br><br>7/9<br>7/10<br>8/11<br>8<br>8 |

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Intensité modérée 3-6 METs : 150 minutes par semaine

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Bruno B, et al. Rev Med Suisse 2019

# Physical activity, function, and longevity among the very old

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

*** 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

# Leisure Time Physical Activity (LTPA) and Mortality

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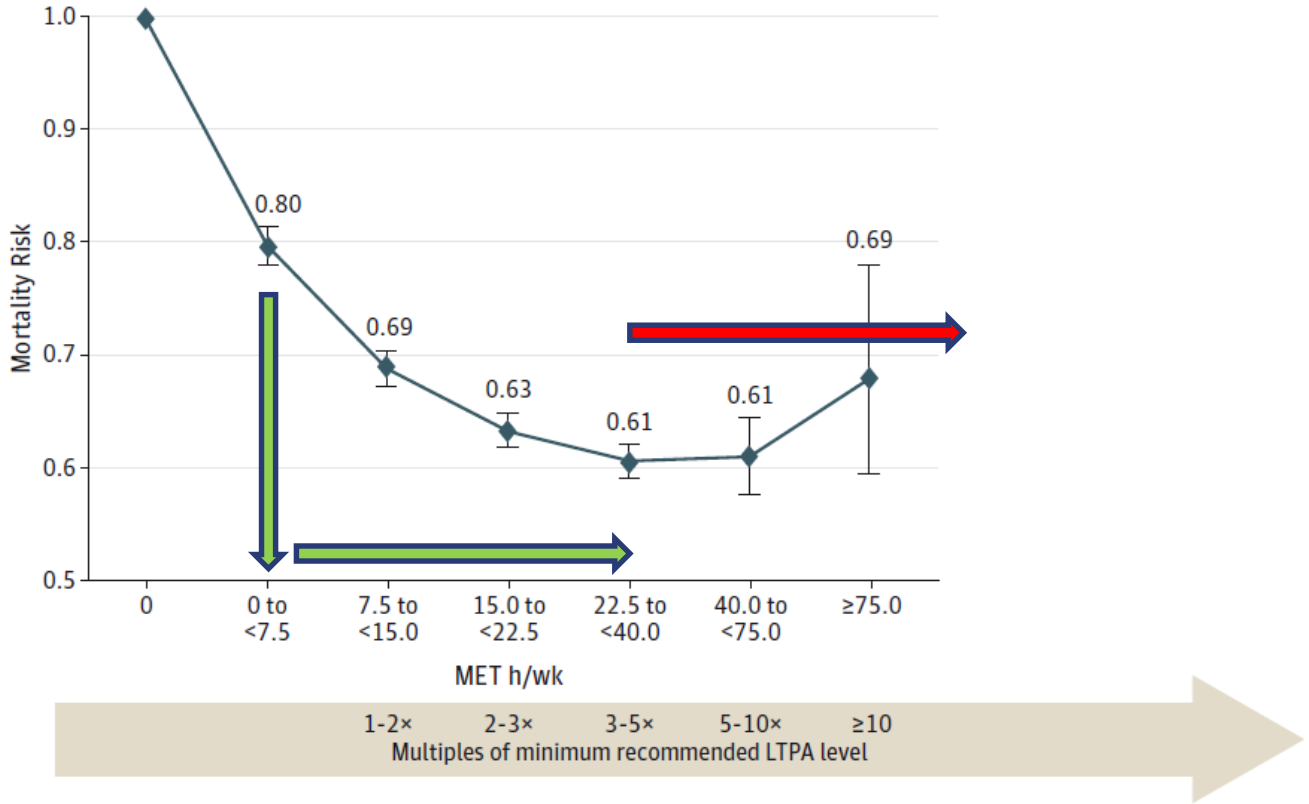
**Table 1. Descriptive Characteristics of 661 137 Study Participants**

| Characteristic | No. of Participants | LTPA Level, MET h/wk, No. (%)[a] | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 0.1 to <7.5 | 7.5 to <15.0 | 15.0 to <22.5 | 22.5 to <40.0 | 40.0 to <75.0 | ≥75.0 |
| Participants | 661 137 | 52 848 (8.0) | 172 203 (26.1) | 170 563 (25.8) | 118 169 (17.9) | 124 446 (18.8) | 18 831 (2.9) | 4077 (0.6) |
| Deaths | 116 686 | 11 523 (9.9) | 33 511 (28.7) | 28 957 (24.8) | 19 979 (17.1) | 21 114 (18.1) | 1390 (1.2) | 212 (0.2) |
| Age, y | | | | | | | | |
| <60 | 276 418 | 25 554 (50) | 75 671 (45) | 71 031 (43) | 45 451 (39) | 44 721 (36) | 11 261 (65) | 2729 (76) |
| 60 to <70 | 307 556 | 19 694 (39) | 75 954 (45) | 79 553 (48) | 60 978 (53) | 66 113 (54) | 4631 (27) | 633 (18) |
| ≥70 | 61 356 | 5924 (12) | 16 838 (10) | 16 022 (10) | 9190 (8) | 11 838 (10) | 1332 (8) | 212 (6) |
| Sex | | | | | | | | |
| Men | 291 485 | 19 867 (38) | 71 564 (42) | 74 298 (44) | 61 553 (49) | 5685 (49) | 5685 (30) | 1123 (28) |
| Women | 369 652 | 32 981 (62) | 100 639 (58) | 96 265 (56) | 60 774 (51) | 62 893 (51) | 13 146 (70) | 2954 (72) |
| Smoking status | | | | | | | | |
| Never | 275 388 | 21 168 (41) | 73 112 (43) | 72 824 (43) | 47 519 (41) | 49 729 (41) | 8984 (48) | 2052 (51) |
| Former | 298 256 | 21 239 (41) | 74 182 (44) | 76 979 (46) | 56 663 (49) | 59 759 (49) | 7900 (42) | 1534 (38) |
| Current | 74 977 | 9730 (19) | 21 866 (13) | 17 721 (11) | 11 272 (10) | 12 101 (10) | 1826 (10) | 461 (11) |
| Alcohol intake | | | | | | | | |
| None | 179 676 | 19 935 (38) | 52 463 (30) | 44 710 (26) | 26 271 (22) | 30 912 (25) | 4415 (23) | 970 (24) |
| 1 Drink/d | 376 861 | 26 750 (51) | 95 829 (56) | 99 981 (59) | 69 817 (59) | 69 498 (56) | 12 298 (65) | 2688 (66) |
| 2 Drinks/d | 54 063 | 2542 (5) | 11 550 (7) | 13 745 (8) | 12 114 (10) | 12 609 (10) | 1273 (7) | 230 (6) |
| Educational level | | | | | | | | |
| College graduate | 250 564 | 14 324 (29) | 61 415 (37) | 67 527 (41) | 50 433 (44) | 48 175 (40) | 7257 (44) | 1433 (43) |
| Marital status | | | | | | | | |
| Married | 474 338 | 38 407 (77) | 123 151 (77) | 123 954 (77) | 83 143 (74) | 89 568 (76) | 13 176 (81) | 2939 (76) |
| BMI | | | | | | | | |
| <25.0 | 277 193 | 18 841 (36) | 63 975 (38) | 70 716 (42) | 51 582 (44) | 58 629 (48) | 11 043 (60) | 2407 (60) |
| 25.0 to <30.0 | 256 713 | 19 133 (37) | 66 709 (39) | 67 480 (40) | 47 325 (40) | 49 015 (40) | 5867 (32) | 1184 (30) |
| ≥30.0 | 119 988 | 14 046 (27) | 39 736 (23) | 30 758 (18) | 18 057 (15) | 15 367 (12) | 1632 (9) | 392 (10) |
| Race | | | | | | | | |
| White | 627 393 | 49 915 (96) | 162 946 (96) | 162 468 (97) | 111 831 (96) | 118 415 (97) | 18 042 (96) | 3776 (93) |
| Comorbidities | | | | | | | | |
| Heart disease | 61 158 | 4380 (8) | 15 450 (9) | 15 462 (9) | 12 512 (11) | 12 445 (10) | 777 (4) | 132 (3) |
| Cancer | 46 358 | 4381 (8) | 13 140 (8) | 12 214 (7) | 7099 (6) | 8109 (7) | 1198 (6) | 217 (5) |

Arem H, et al. JAMA Intern Med 2015

# Leisure Time Physical Activity (LTPA) and Mortality

Figure. Hazard Ratios (HRs) and 95% CIs for Leisure Time Moderate- to Vigorous-Intensity Physical Activity and Mortality




The dose-response curve and category-specific HR estimates of exercise levels compared with the federally recommended minimum of 7.5 metabolic equivalent (MET) hours per week. Models were stratified by cohort and use age as the underlying time scale. The model was adjusted for sex, smoking (never, former, current, or missing), alcohol (none, <15 g/day, 15 to <30 g/day, or ≥30 g/day), educational level (dropout, high school, post–high school training, some college, college graduate, postcollege, or missing), marital status (married, divorced, widowed, single, or missing), history of cancer, history of heart disease, and body mass index (calculated as weight in kilograms divided by height in meters squared) (<18.5, 18.5 to <25.0, 25.0 to <30.0, 30.0 to <35.0, or ≥35.0).The dotted line between categories illustrates an assumed dose-response curve rather than individual data points. Crude and adjusted risk estimates are presented in eTable 3 in the Supplement.

Arem H, et al. JAMA Intern Med 2015

# 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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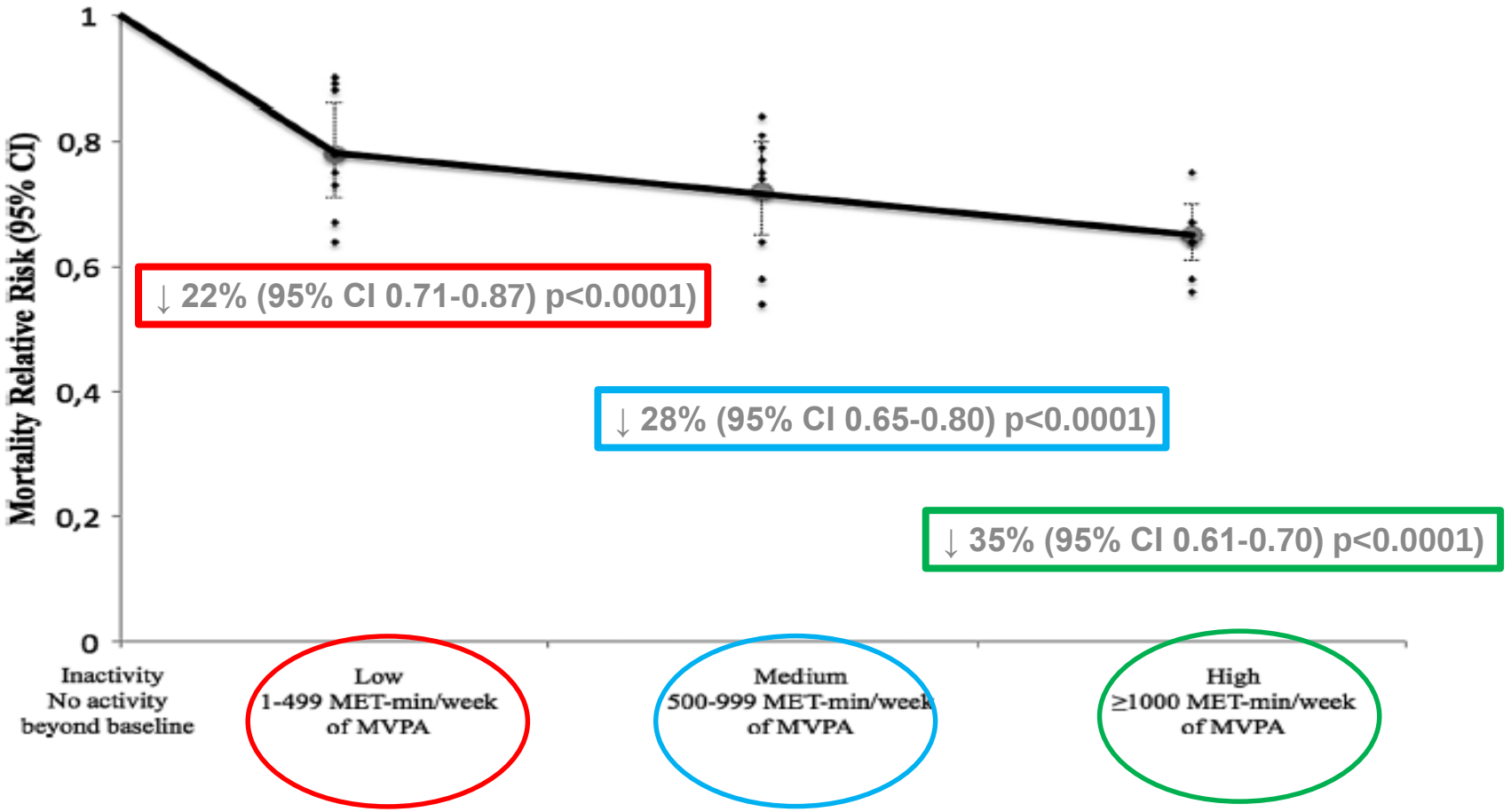


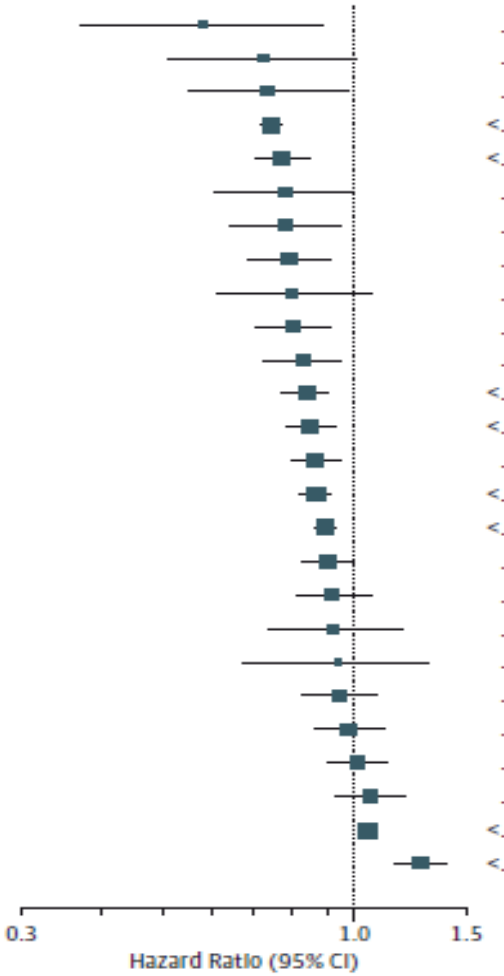

Hupin D, et al. Br J Sports Med 2015

# Association of leisure-time physical activity with the risk of 26 types of cancer in 1.44 million adults

Hôpital du Valais
Spital Wallis

**Figure 1. Summary Multivariable Hazard Ratios for a Higher (90th Percentile) vs Lower (10th Percentile) Level of Leisure-Time Physical Activity by Cancer Type**

| Cancer | Studies, No. | Cases, No. | HR (95% CI) | *P* Value Trend | *P* Value Heterogeneity[a] |
|---|---|---|---|---|---|
| Esophageal adenocarcinoma | 5 | 899 | 0.58 (0.37-0.89) | .01 | .01 |
| Gallbladder | 6 | 382 | 0.72 (0.51-1.01) | .06 | .29 |
| Liver | 10 | 1384 | 0.73 (0.55-0.98) | .04 | .02 |
| Lung | 12 | 19 133 | 0.74 (0.71-0.77) | <.001 | .47 |
| Kidney | 11 | 4548 | 0.77 (0.70-0.85) | <.001 | .40 |
| Small intestine | 7 | 503 | 0.78 (0.60-1.00) | .05 | .85 |
| Gastric cardia | 6 | 790 | 0.78 (0.64-0.95) | .02 | .99 |
| Endometrial | 9 | 5346 | 0.79 (0.68-0.92) | .003 | .001 |
| Esophageal squamous | 6 | 442 | 0.80 (0.61-1.06) | .12 | .78 |
| Myeloid leukemia | 10 | 1692 | 0.80 (0.70-0.92) | .002 | .78 |
| Myeloma | 9 | 2161 | 0.83 (0.72-0.95) | .008 | .36 |
| Colon | 12 | 14 160 | 0.84 (0.77-0.91) | <.001 | .01 |
| Head and neck | 11 | 3985 | 0.85 (0.78-0.93) | <.001 | .45 |
| Rectum | 12 | 5531 | 0.87 (0.80-0.95) | .001 | .38 |
| Bladder | 12 | 9073 | 0.87 (0.82-0.92) | <.001 | .84 |
| Breast | 10 | 35 178 | 0.90 (0.87-0.93) | <.001 | .30 |
| Non-Hodgkin lymphoma | 11 | 6953 | 0.91 (0.83-1.00) | .05 | .18 |
| Thyroid | 11 | 1829 | 0.92 (0.81-1.06) | .26 | .48 |
| Gastric noncardia | 7 | 1428 | 0.93 (0.73-1.19) | .56 | .09 |
| Soft tissue | 10 | 851 | 0.94 (0.67-1.31) | .70 | .03 |
| Pancreas | 10 | 4186 | 0.95 (0.83-1.08) | .40 | .14 |
| Lymphocytic leukemia | 10 | 2160 | 0.98 (0.87-1.11) | .73 | .99 |
| Ovary | 9 | 2880 | 1.01 (0.91-1.13) | .81 | .98 |
| Brain | 10 | 2110 | 1.06 (0.93-1.20) | .41 | .43 |
| Prostate | 7 | 46 890 | 1.05 (1.03-1.08) | <.001 | .90 |
| Malignant melanoma | 12 | 12 438 | 1.27 (1.16-1.40) | <.001 | .02 |




Moore SC, et al. JAMA Intern Med 2016

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| Lung | 12 | 19 133 | 0.74 (0.71-0.77) | <.001 | .47 |
| Kidney | 11 | 4548 | 0.77 (0.70-0.85) | <.001 | .40 |
| Small intestine | 7 | 503 | 0.78 (0.60-1.00) | .05 | .85 |
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| Pancreas | 10 | 4186 | 0.95 (0.83-1.08) | .40 | .14 |
| Lymphocytic leukemia | 10 | 2160 | 0.98 (0.87-1.11) | .73 | .99 |
| Ovary | 9 | 2880 | 1.01 (0.91-1.13) | .81 | .98 |
| Brain | 10 | 2110 | 1.06 (0.93-1.20) | .41 | .43 |
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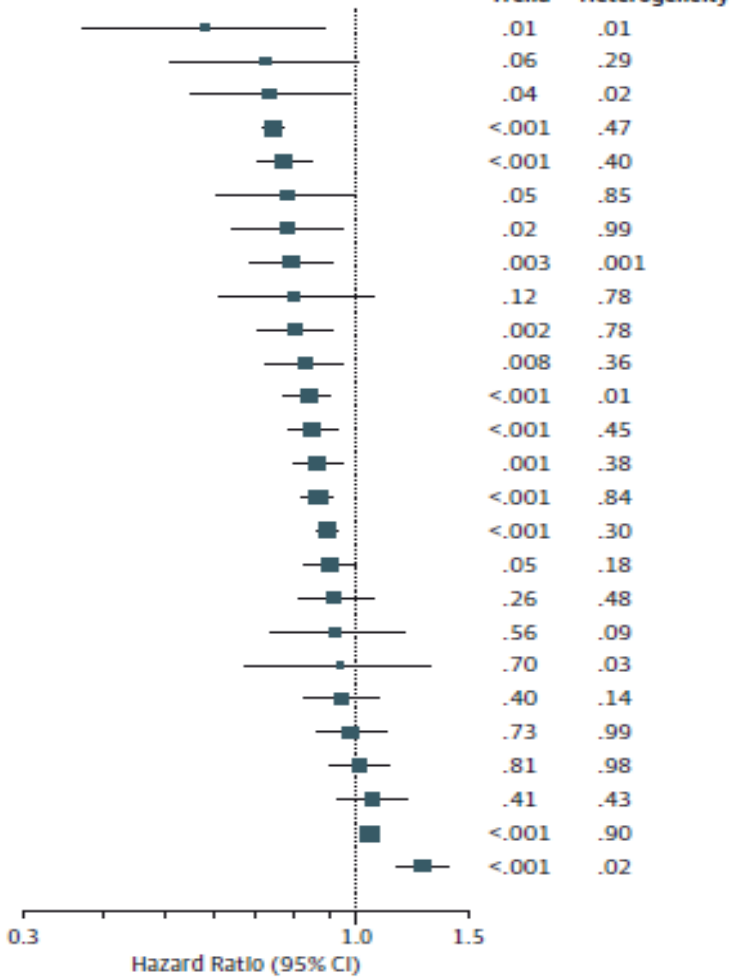


**risk of 13/ 26 cancers**



Moore SC, et al. JAMA Intern Med 2016

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| Ovary | 9 | 2880 | 1.01 (0.91-1.13) | .81 | .98 |
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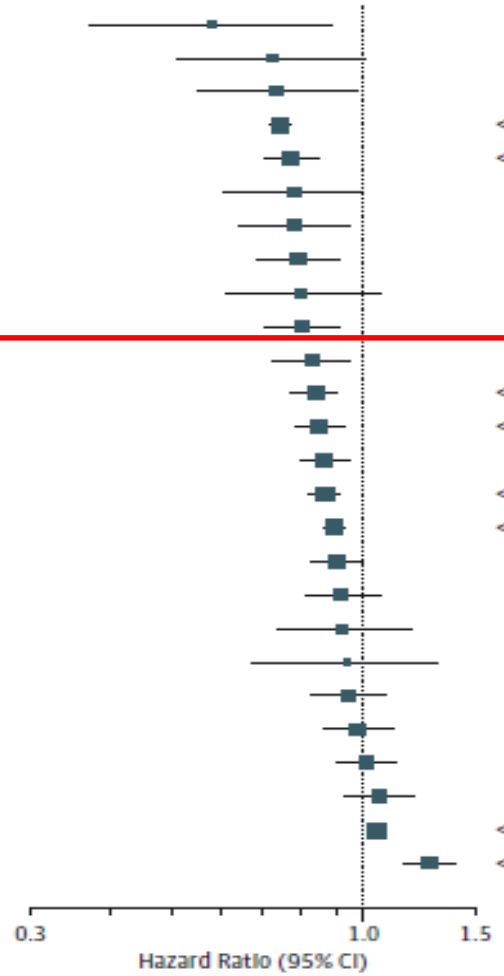



**risk of 20 %**

**risk of 13/ 26 cancers**



Moore SC, et al. JAMA Intern Med 2016

# Activité physique et prévention des chutes

Hôpital du Valais
Spital Wallis

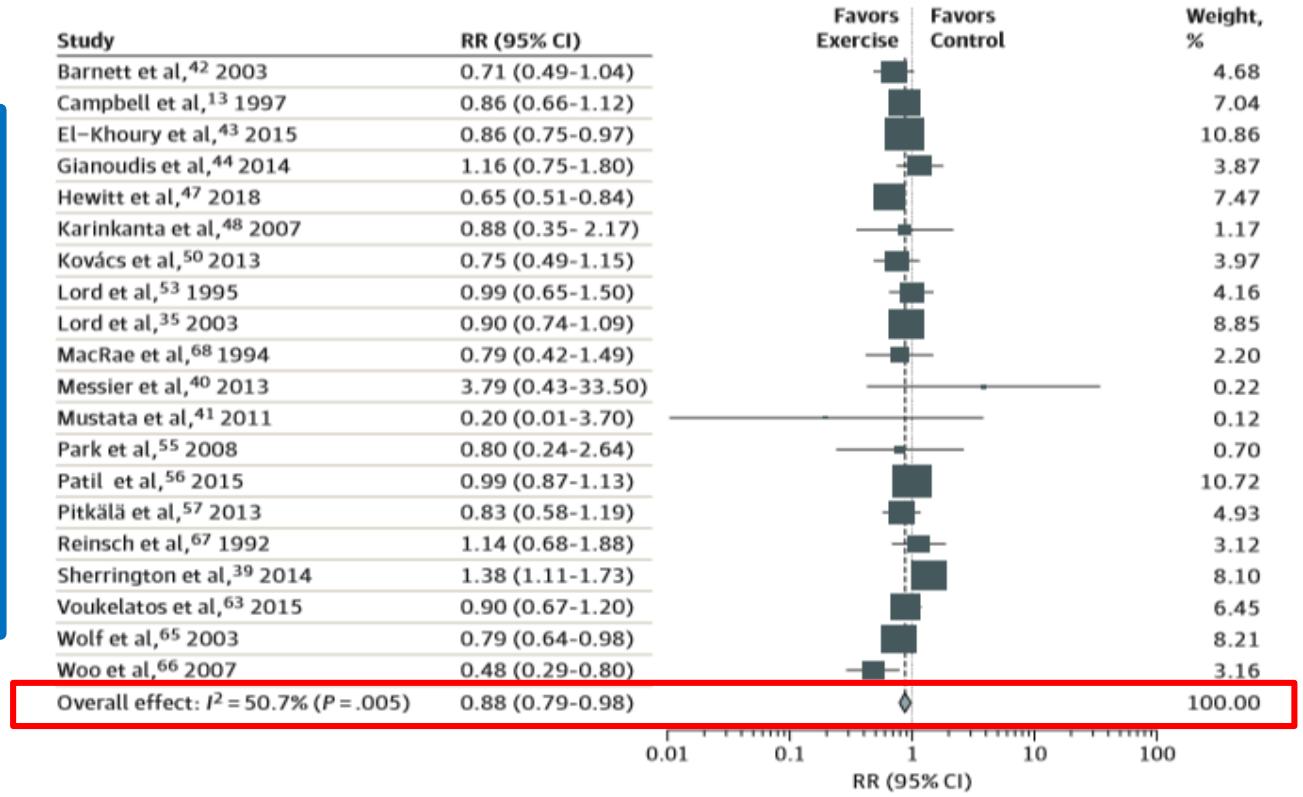
## Association of Exercice on the risk of becoming a faller

**Meta-analysis of 40 long-term RCT of 21 868 participants**

**Age > 60 years**

**What is the association**
- **of long-term (>1year) exercice**
- **moderate intensity (3x 50'/week)**
- **multicomponent (aerobic, balance and strength) exercice**

**with the risk of falls in older adults?**




| Study | RR (95% CI) | Weight, % |
|---|---|---|
| Barnett et al,[42] 2003 | 0.71 (0.49-1.04) | 4.68 |
| Campbell et al,[13] 1997 | 0.86 (0.66-1.12) | 7.04 |
| El-Khoury et al,[43] 2015 | 0.86 (0.75-0.97) | 10.86 |
| Gianoudis et al,[44] 2014 | 1.16 (0.75-1.80) | 3.87 |
| Hewitt et al,[47] 2018 | 0.65 (0.51-0.84) | 7.47 |
| Karinkanta et al,[48] 2007 | 0.88 (0.35- 2.17) | 1.17 |
| Kovács et al,[50] 2013 | 0.75 (0.49-1.15) | 3.97 |
| Lord et al,[53] 1995 | 0.99 (0.65-1.50) | 4.16 |
| Lord et al,[35] 2003 | 0.90 (0.74-1.09) | 8.85 |
| MacRae et al,[68] 1994 | 0.79 (0.42-1.49) | 2.20 |
| Messier et al,[40] 2013 | 3.79 (0.43-33.50) | 0.22 |
| Mustata et al,[41] 2011 | 0.20 (0.01-3.70) | 0.12 |
| Park et al,[55] 2008 | 0.80 (0.24-2.64) | 0.70 |
| Patil et al,[56] 2015 | 0.99 (0.87-1.13) | 10.72 |
| Pitkälä et al,[57] 2013 | 0.83 (0.58-1.19) | 4.93 |
| Reinsch et al,[67] 1992 | 1.14 (0.68-1.88) | 3.12 |
| Sherrington et al,[39] 2014 | 1.38 (1.11-1.73) | 8.10 |
| Voukelatos et al,[63] 2015 | 0.90 (0.67-1.20) | 6.45 |
| Wolf et al,[65] 2003 | 0.79 (0.64-0.98) | 8.21 |
| Woo et al,[66] 2007 | 0.48 (0.29-0.80) | 3.16 |
| Overall effect: $I^2 = 50.7\%$ ($P = .005$) | 0.88 (0.79-0.98) | 100.00 |

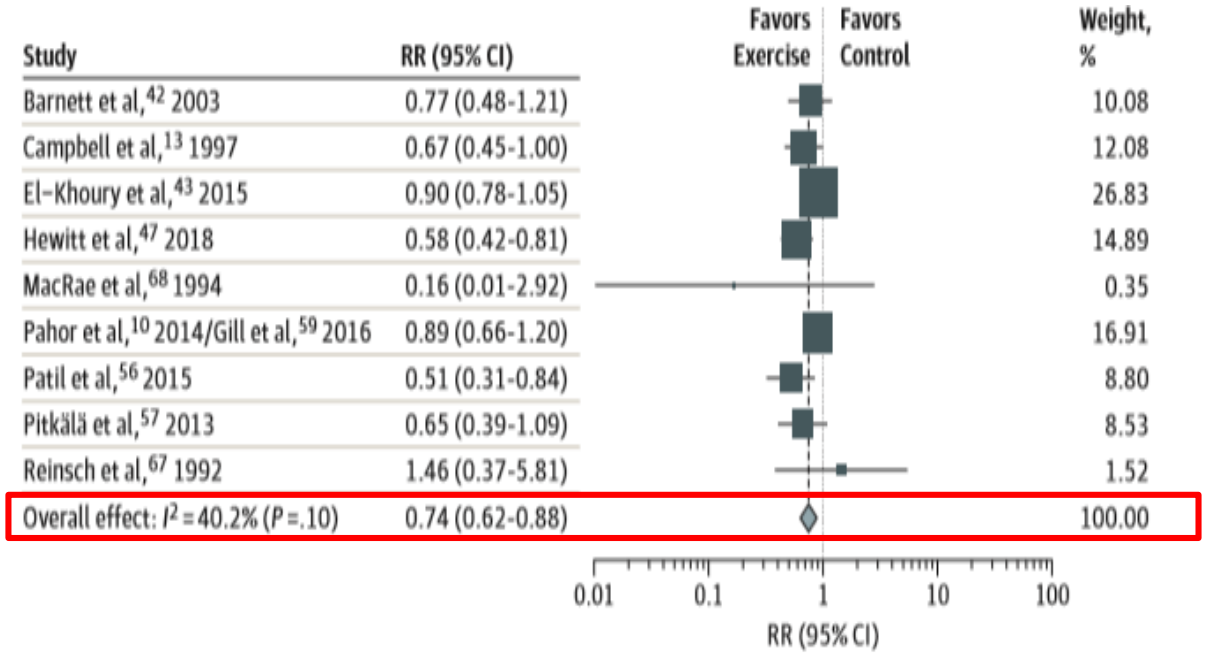
# Activité physique et prévention des chutes

## Association of Exercice on the risk of becoming a injurious faller

**Meta-analysis of 40 long-term RCT of 21 868 participants**
**Age > 60 years**

**What is the association**
- **of long-term (>1year) exercice**
- **moderate intensity (3x 50'/week)**
- **multicomponent (aerobic, balance and strength) exercice**

**with the risk of fractures in older adults?**




De Souto Barreto P, et al. JAMA Intern Med 2019

# Activité physique et prévention des chutes

Hôpital du Valais
Spital Wallis

Cochrane Library
Cochrane Database of Systematic Reviews

## Exercise for preventing falls in older people living in the community (Review)

**Exercise (all types) versus control (e.g. usual activities) for preventing falls in older people living in the community**

**Patient or population:** Older people living in the community (trials focusing on people recently discharged from hospital were not included)
**Settings:** Community, either at home or in places of residence that, on the whole, do not provide residential health-related care
**Intervention:** Exercise of all types[a]
**Comparison:** Usual care (no change in usual activities) or a control (non-active) intervention[b]

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of participants (studies) | Certainty of the evidence (GRADE) |
|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | |
| | Control | Exercise (all types) | | | |
| Rate of falls (falls per person-years)<br>Follow-up: range 3 to 30 months | **All studies population** | | **Rate ratio 0.77 (0.71 to 0.83)[d]** | 12,981 (59 RCTs) | ⊕⊕⊕⊕ **high[e]** |



Sherrington C, et al. Cochrane Database Syst Rev, 2019

# Midlife fitness and the development of chronic conditions in later life

Hôpital du Valais
Spital Wallis

Design: Prospective, observational cohort study.

**N= 19 458**
**Age. 49.8 ± 8.7 years (baseline)**
**Follow-up : 25 years**

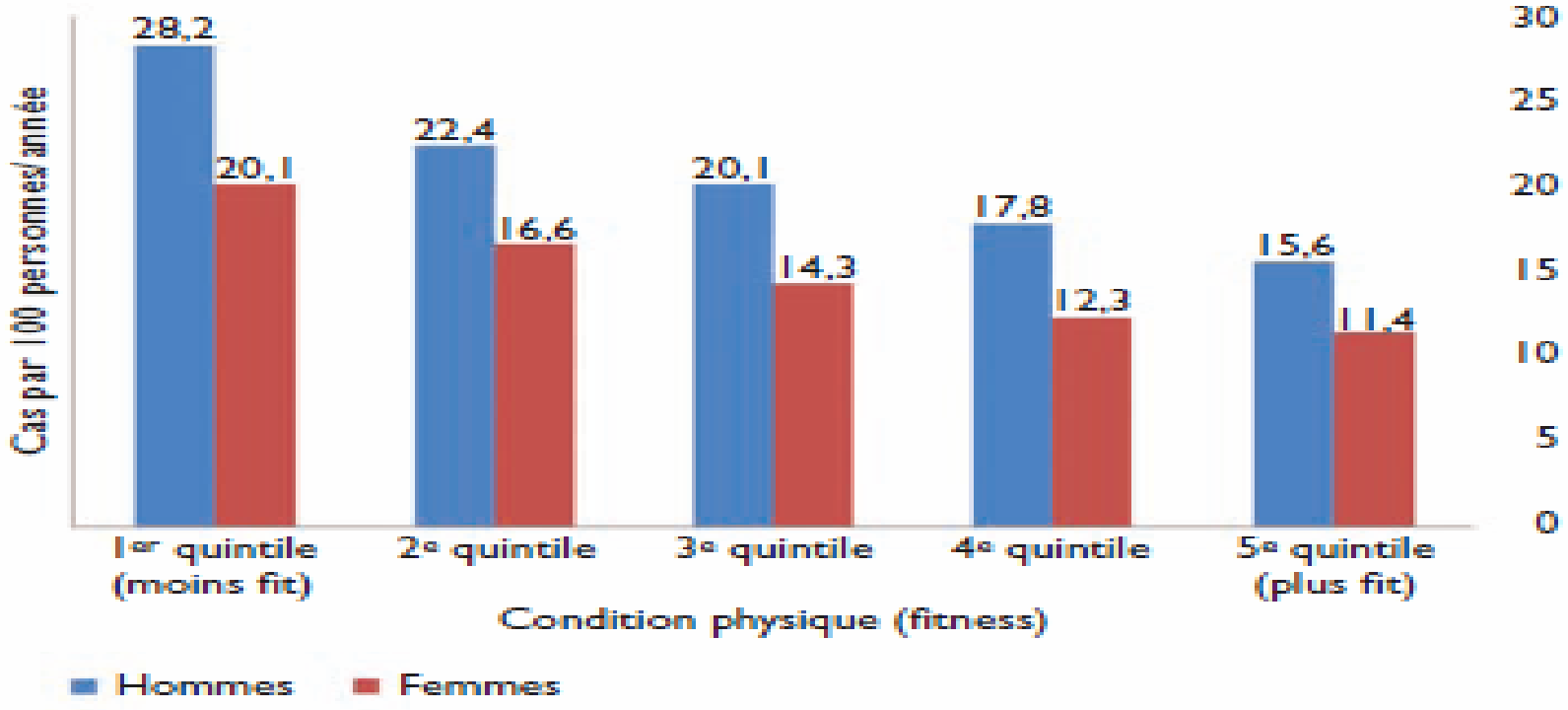



**Figure 1. Incidence de maladies chroniques après 65 ans en fonction du degré de condition physique chez les hommes et les femmes**

Quintile de condition physique allant du moins «fit» au plus «fit». (Adaptée de réf.[2]).

Willis BL, et al. Arch Intern Med 2012

Major K, et al. Rev Med Suisse 2013

# The Association Between Midlife Cardiorespiratory Fitness Levels and Later-Life Dementia

Hôpital du Valais
Spital Wallis

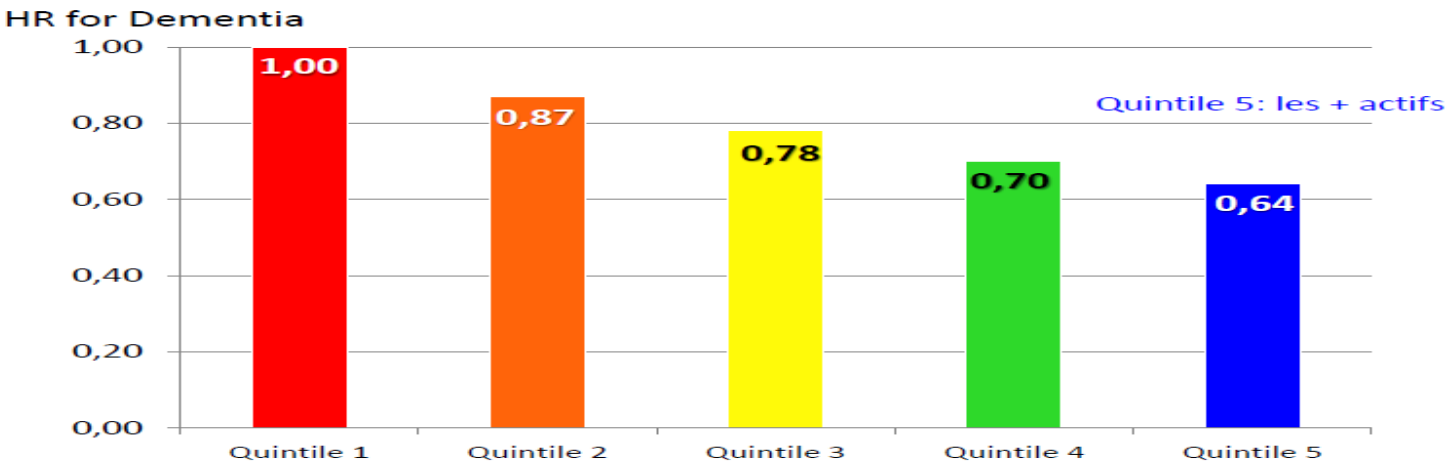
Design: Prospective, observational cohort study.

**N= 19 458**
**Age. 49.8 ± 8.7 years (baseline)**
**Follow-up : 25 years**

*Table 2.* Cox Proportional Hazards Model for Incident Alzheimer Disease and Related Types of Dementia

| Effect, by Model Adjustment | Hazard Ratio (95% CI) | *P* Value |
|---|---|---|
| **Adjustment 1 ($n$ = 19 458)*** | | |
| Quintile 1 (reference) | 1.00 | – |
| Quintile 2 | 0.87 (0.75–1.01) | 0.069 |
| Quintile 3 | 0.78 (0.67–0.91) | 0.001 |
| Quintile 4 | 0.70 (0.60–0.81) | <0.001 |
| Quintile 5 | 0.64 (0.54–0.76) | <0.001 |

Probabilité de développer une démence 25 ans plus tard en fonction niveau d'endurance à l'âge adulte?




The Association between Midlife Cardiorespiratory Fitness and Later-Life Dementia, DeFina LF et al. Ann Intern Med 2013; 158: 162-168

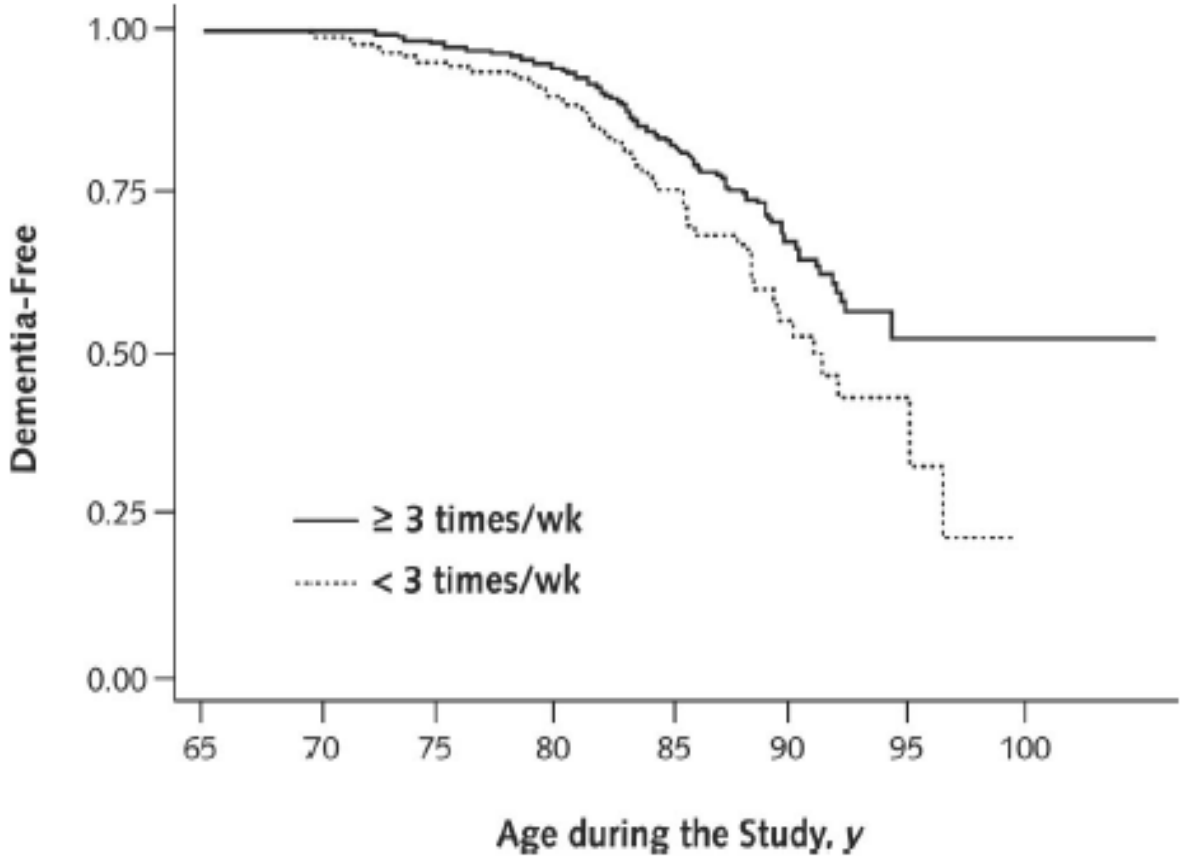
# Exercice is associated with reduced risk for incident dementia among persons 65 years of age and older

Hôpital du Valais
Spital Wallis

- **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')**

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

Hôpital du Valais
Spital Wallis




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

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

Hôpital du Valais
Spital Wallis

- **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

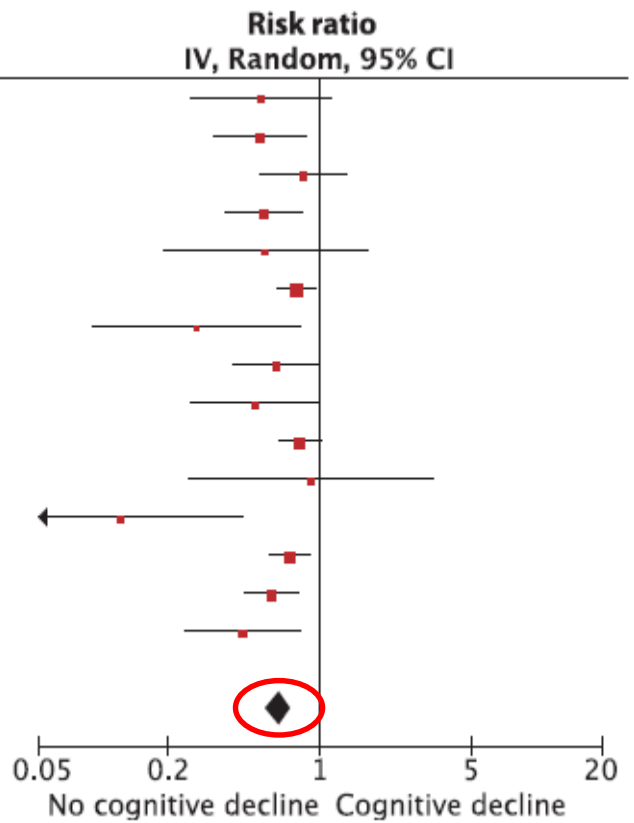
# Physical activity and risk of cognitive decline: a meta-analysis of prospective studies

Hôpital du Valais
Spital Wallis

## 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

# Aerobic Exercice in older people without known cognitive impairment

Hôpital du Valais
Spital Wallis

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

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

Hôpital du Valais
Spital Wallis

- **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

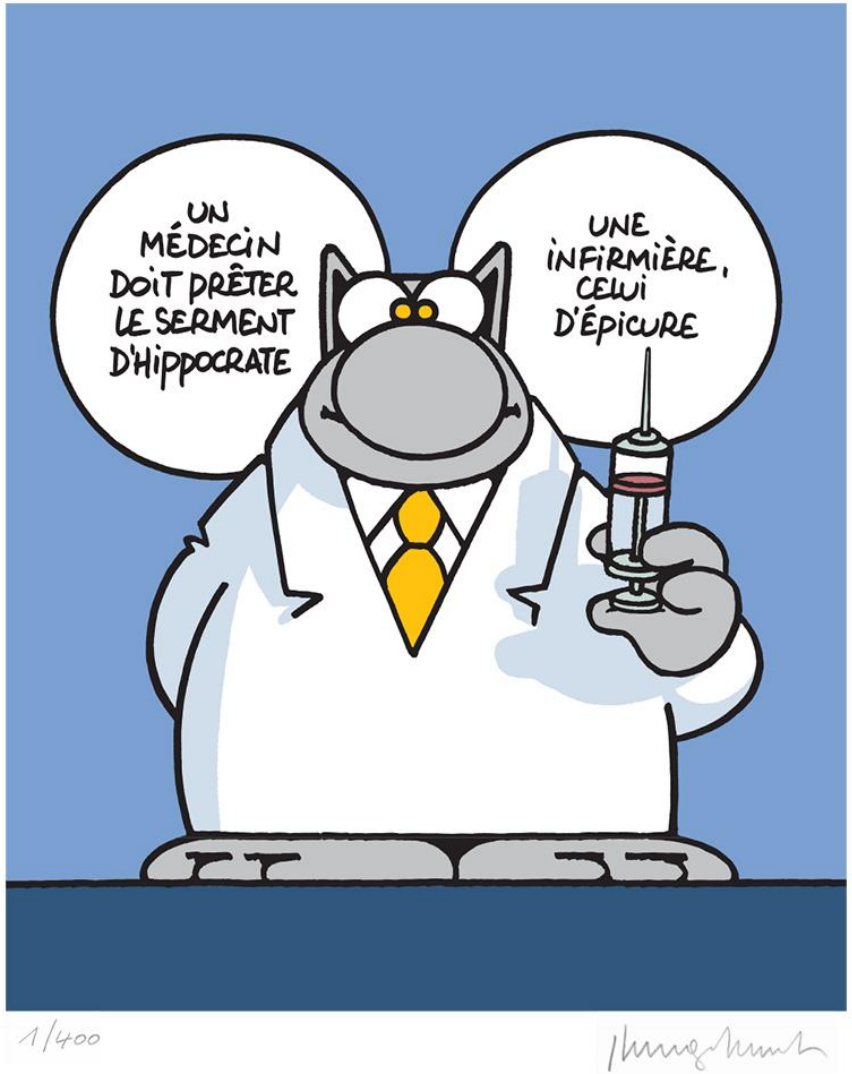
# Risk of cognitive decline from baseline to 24 months (FINGER)

| | 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

# Sommaire

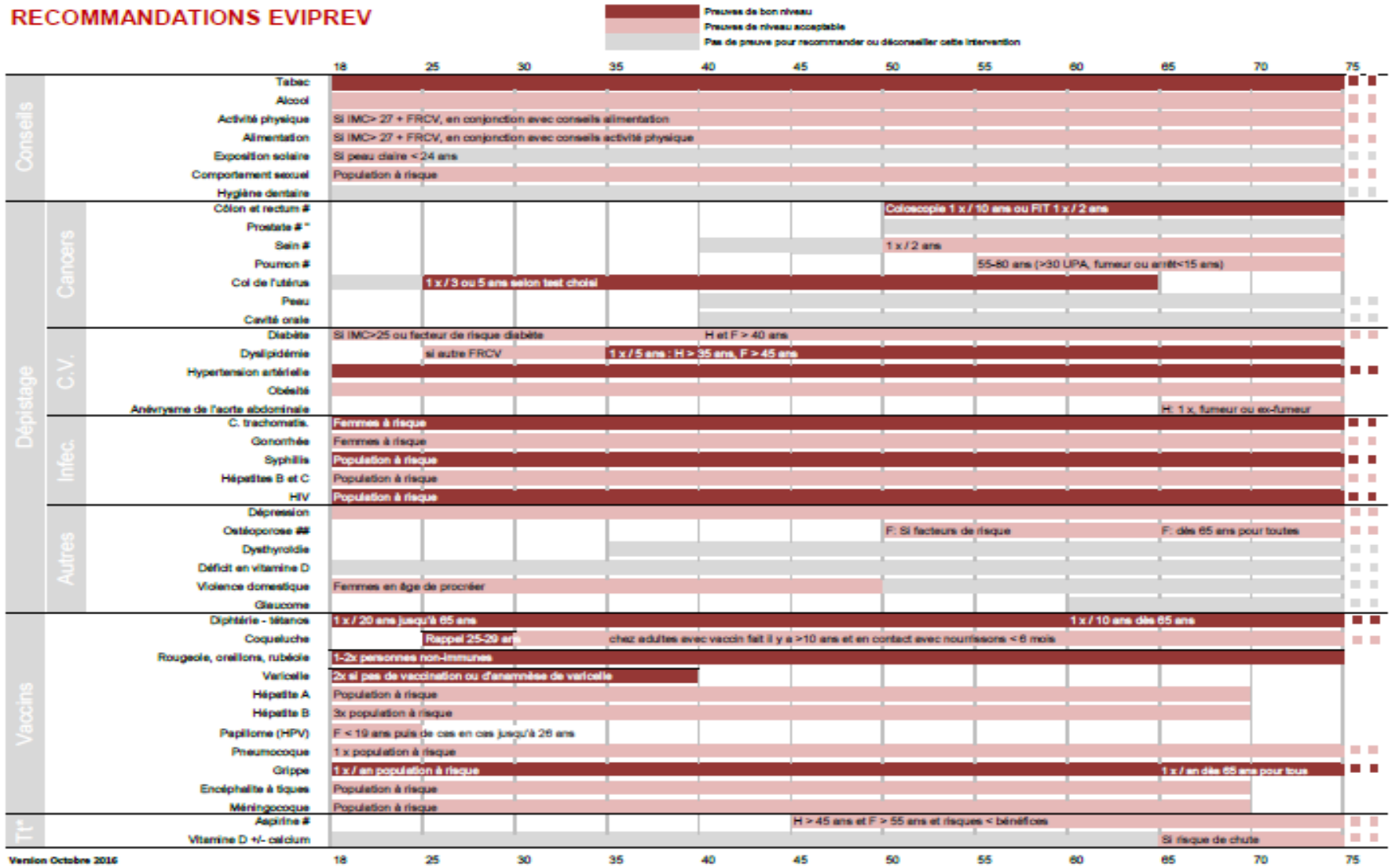



- **Recommandations pour la prévention chez les seniors**
- **Bénéfices de l'activité physique**
  - Longévité et performance fonctionnelle
  - Cancers
  - Prévention de la chute
  - Déclin cognitif
- **Dépistage**
- **Vaccinations**
- **Vitamine D**

# Prévention: Recommandations académiques

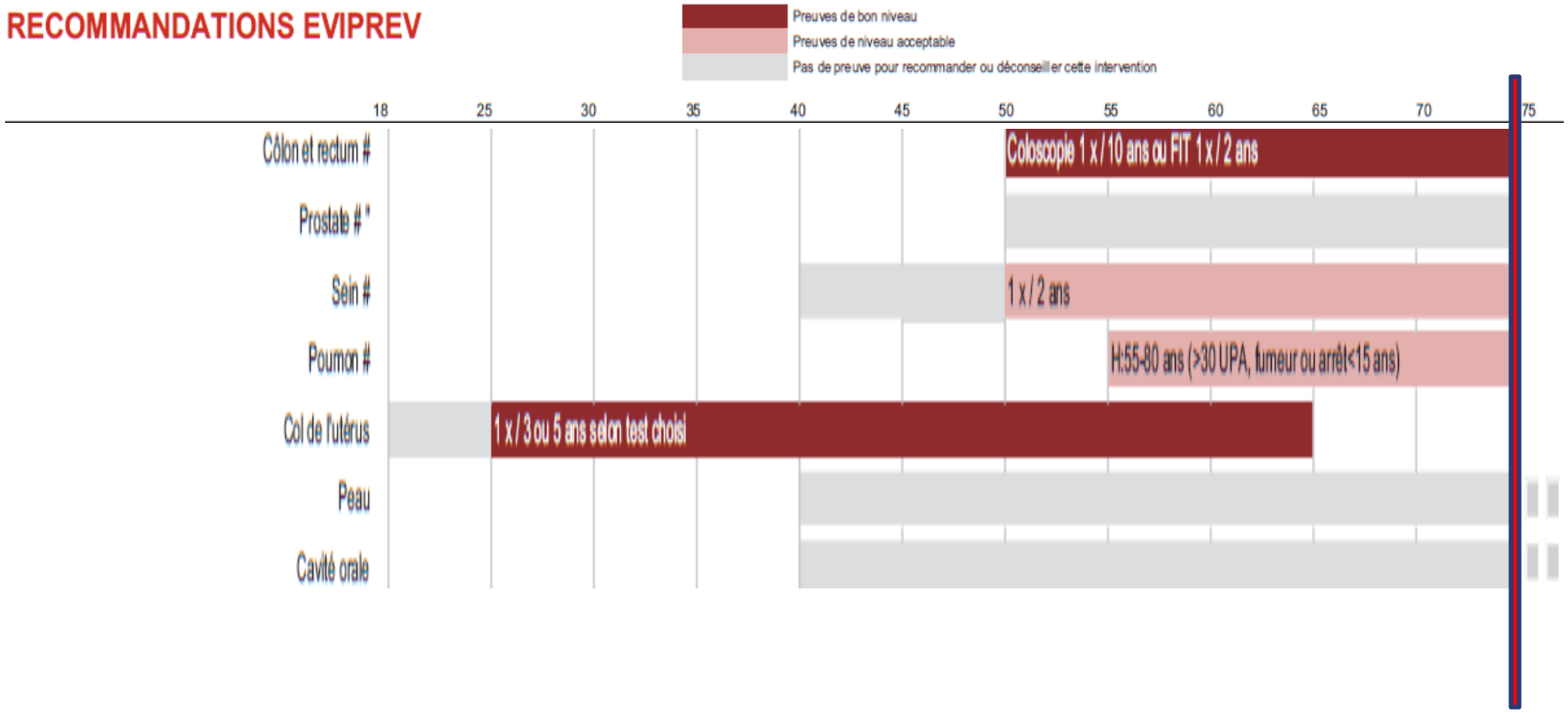
Hôpital du Valais
Spital Wallis

Policlinique Médicale Universitaire CH-Lausanne




Cornuz J, et al. Rev Med Suisse 2015

# Prévention : dépistage du cancer





Cornuz J, et al. Rev Med Suisse 2015

# Temps jusqu'au bénéfice des interventions préventives pour le sujet âgé

Hôpital du Valais
Spital Wallis

| Temps jusqu'au bénéfice | INTERVENTION PREVENTIVE |
|---|---|
| **8-19 mois** | Biphosphonates - ostéoporose |
| **1-2 ans** | Prévention primaire - hypertension |
| **2-5 ans** | Prévention primaire - statine |
| **5 ans** | Remplacement chirurgical (vs transcatheter) de la valve aortique si sténose aortique serrée |
| **6-8 ans** | Cure chirurgicale (vs endovasculaire) d'un anévrisme aortique abdominal |
| **10 ans** | Contrôle glycémique sévère - diabète |
| **10 ans** | Dépistage du cancer colorectal |
| **10 ans** | Dépistage du cancer du sein |
| **10-15 ans** | Dépistage du cancer de la prostate |

# Vaccinations du Senior

- **Influenza**
  - annuel dès 65 ans
  - couverture en CH >65 ans (37%) sln OFSP
  - en CH/ année:
    - 100-200 000 consultations
    - 1000-5000 hospitalisations
    - 600-700 décès
- **Herpès Zoster**
  - Entre 65 et 79 ans, indépendamment des antécédents de varicelle et de zona
- **Diphtérie-tetanos**
  - rappel aux 10 ans
  - diphtérie disparue en CH depuis 1983
- **Pneumoccoque (PCV13, Prevenar-13)**
  - N'est plus recommandé après 65 ans depuis 2014, sauf sujets à risque de maladie invasive (cardiopathie, BPCO, cirrhose, splénectomie, néoplasie,..)


Office fédéral santé publique, Plan de vaccination 2019 http://www.bag.admin.ch),accessed Mai 24, 2019
Hentsch L, et al. Rev Med Suisse 2017

# Vitamine D: nouvelles recommandations

Hôpital du Valais
Spital Wallis

Vitamin D, Calcium, or Combined Supplementation for the primary prevention of fractures and falls in Community-Dwelling Older Adults

*US Preventive Services Task Force (USPSTF) Recommendation Statement*

- **Pas de bénéfices**
  - Supplémentation en vit D pour prévention Primaire des chutes
  - Supplémentation en vit D et/ou Calcium pour prévention Primaire des fractures (si absence d'ostéoporose ou de carence en vitamine D)
  - Supplémentation à petite dose (vit d ≤ 400 UI, Calcium ≤1000 mg) chez femme post-ménopausée (NB excès de calculs rénaux avec suppl. combinée)


Ferrari-Bischoff HA. JAMA 2018
US Preventive Services Task Force. JAMA 2018

# Vitamine D: nouvelles recommandations

Hôpital du Valais
Spital Wallis

Vitamin D, Calcium, or Combined Supplementation for the primary prevention of fractures and falls in Community-Dwelling Older Adults

*US Preventive Services Task Force (USPSTF) Recommendation Statement*

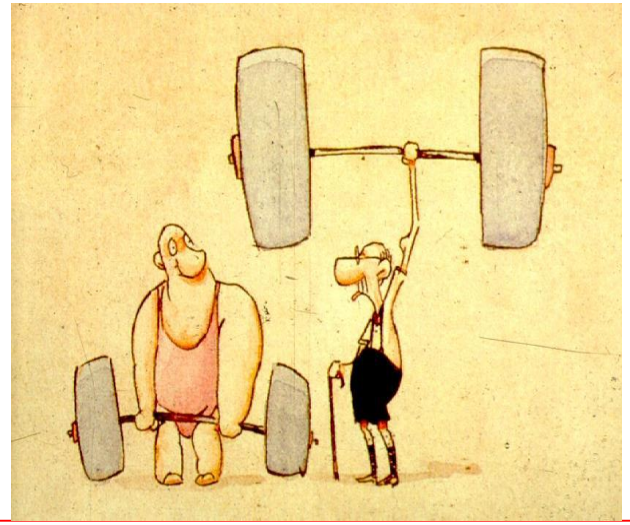
## Supplémentation en Vitamine D:  800-1000 UI/j

- Sujet institutionnalisé
- Carencé en vitamine D
- A haut  risque d'ostéoporose et de fracture:
  - Antécédents de fractures
  - Âge >75 ans
  - Problèmes de mobilité, de marche ou d'équilibre

## Pas de supplémentation préventive en vitamine D

- Sujet âgé vivant à domicile
- Sans ostéoporose
- Sans carence en vitamine D

# 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 !

# Régime méditerranéen et risque de développer un trouble neurocognitif-majeur: études observationnelles

Hôpital du Valais
Spital Wallis

| Study or Subgroup | Weight | Risk Ratio IV, Random, 95% CI |
|---|---|---|
| **MCI** | | |
| Haring, 2016 | 10.8% | 0.82 [0.59, 1.14] |
| Olsson, 2015 | 2.9% | 0.64 [0.31, 1.32] |
| Roberts, 2010 | 7.3% | 0.78 [0.51, 1.19] |
| Scarmeas, 2009-MCI | 11.0% | 0.72 [0.52, 1.00] |
| Tsivgoulis, 2013 | 27.1% | 0.87 [0.76, 1.00] |
| Subtotal (95% CI) | 59.1% | 0.83 [0.75, 0.93] |
| Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 1.78$, df = 4 (P = 0.78); $I^2 = 0\%$ | | |
| Test for overall effect: Z = 3.22 (P = 0.001) | | |
| **AD** | | |
| Feart, 2009 | 2.4% | 0.86 [0.39, 1.90] |
| Morris, 2015 | 5.1% | 0.49 [0.29, 0.83] |
| Olsson, 2015 | 2.3% | 0.99 [0.44, 2.23] |
| Scarmeas, 2006 | 9.6% | 0.60 [0.42, 0.86] |
| Scarmeas, 2009-AD | 4.7% | 0.52 [0.30, 0.90] |
| Subtotal (95% CI) | 24.2% | 0.60 [0.48, 0.77] |
| Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 3.09$, df = 4 (P = 0.54); $I^2 = 0\%$ | | |
| Test for overall effect: Z = 4.18 (P < 0.0001) | | |
| **Dementia** | | |
| Feart, 2009 | 3.8% | 1.12 [0.60, 2.09] |
| Haring, 2016 | 9.6% | 1.13 [0.79, 1.62] |
| Olsson, 2015 | 3.4% | 0.85 [0.44, 1.64] |
| Subtotal (95% CI) | 16.7% | 1.07 [0.81, 1.42] |
| Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.58$, df = 2 (P = 0.75); $I^2 = 0\%$ | | |
| Test for overall effect: Z = 0.48 (P = 0.63) | | |
| **Total (95% CI)** | **100.0%** | **0.79 [0.70, 0.90]** |
| Heterogeneity: $Tau^2 = 0.01$; $Chi^2 = 15.38$, df = 12 (P = 0.22); $I^2 = 22\%$ | | |
| Test for overall effect: Z = 3.63 (P = 0.0003) | | |
| Test for subgroup differences: $Chi^2 = 9.94$, df = 2 (P = 0.007), $I^2 = 79.9\%$ | | |

Risk Ratio IV, Random, 95% CI

0.01 0.1 1 10 100

**- 20 %**

**Figure 2. Forest plot of relative risks (RRs) and 95% confidence intervals (CIs) for the association between Mediterranean diet score (High vs. Low) and the incident risk of cognitive disorders by outcome type.** MCI, mild cognitive impairment; AD, Alzheimer's disease.



Wu L, et al. Sci Rep 2017

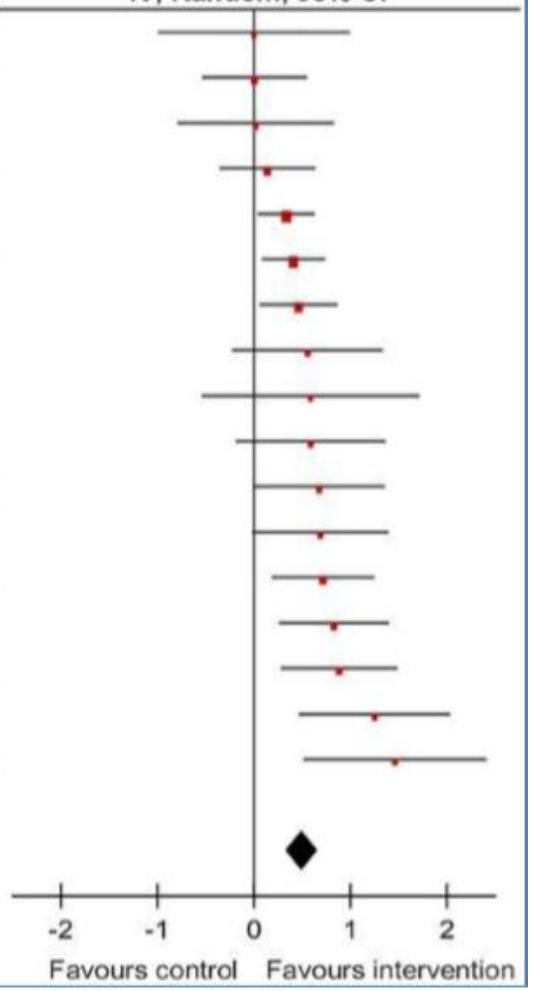
# Effect of Cognitive Stimulation Therapy vs usual care on cognition, measured by the MMSE

Hôpital du Valais
Spital Wallis

| Study or Subgroup | Hedges g | SE | Experimental Total | Control Total | Weight | Hedges g IV, Random, 95% CI |
|---|---|---|---|---|---|---|
| Onor et al 2007 | 0 | 0.5 | 8 | 8 | 2.4% | 0.00 [-0.98, 0.98] |
| Chapman et al 2004 | 0.006 | 0.272 | 26 | 28 | 6.6% | 0.01 [-0.53, 0.54] |
| Tadaka et al 2007 (AD)* | 0.019 | 0.408 | 12 | 12 | 3.4% | 0.02 [-0.78, 0.82] |
| Lai et al 2004 | 0.139 | 0.248 | 36 | 30 | 7.6% | 0.14 [-0.35, 0.63] |
| Spector et al 2003 | 0.336 | 0.144 | 115 | 86 | 14.2% | 0.34 [0.05, 0.62] |
| Onder et al 2005 | 0.41 | 0.162 | 79 | 77 | 12.7% | 0.41 [0.09, 0.73] |
| Wang et al 2007 | 0.464 | 0.201 | 51 | 51 | 10.0% | 0.46 [0.07, 0.86] |
| Coen et al 2011 | 0.557 | 0.393 | 14 | 13 | 3.7% | 0.56 [-0.21, 1.33] |
| Bottino et al 2005 | 0.587 | 0.57 | 6 | 7 | 1.9% | 0.59 [-0.53, 1.70] |
| Tarraga et al 2006 | 0.589 | 0.391 | 16 | 12 | 3.7% | 0.59 [-0.18, 1.36] |
| Tadaka et al 2007 (VD)* | 0.676 | 0.343 | 18 | 18 | 4.6% | 0.68 [0.00, 1.35] |
| Spector et al 2001 | 0.688 | 0.355 | 21 | 14 | 4.3% | 0.69 [-0.01, 1.38] |
| Breuil et al 1994 | 0.716 | 0.265 | 32 | 29 | 6.9% | 0.72 [0.20, 1.24] |
| Baldelli et al 2002 | 0.83 | 0.284 | 71 | 16 | 6.2% | 0.83 [0.27, 1.39] |
| Requena et al 2006 | 0.884 | 0.302 | 20 | 30 | 5.6% | 0.88 [0.29, 1.48] |
| Haight et al 2006 | 1.252 | 0.395 | 15 | 16 | 3.6% | 1.25 [0.48, 2.03] |
| Baldelli et al 1993 | 1.463 | 0.477 | 13 | 10 | 2.6% | 1.46 [0.53, 2.40] |
| **Total (95% CI)** | | | **553** | **457** | **100.0%** | **0.51 [0.35, 0.66]** |

Heterogeneity: $Tau^2 = 0.03$; $Chi^2 = 21.31$, df = 16 (P = 0.17); $I^2 = 25\%$

Test for overall effect: Z = 6.23 (P < 0.00001)

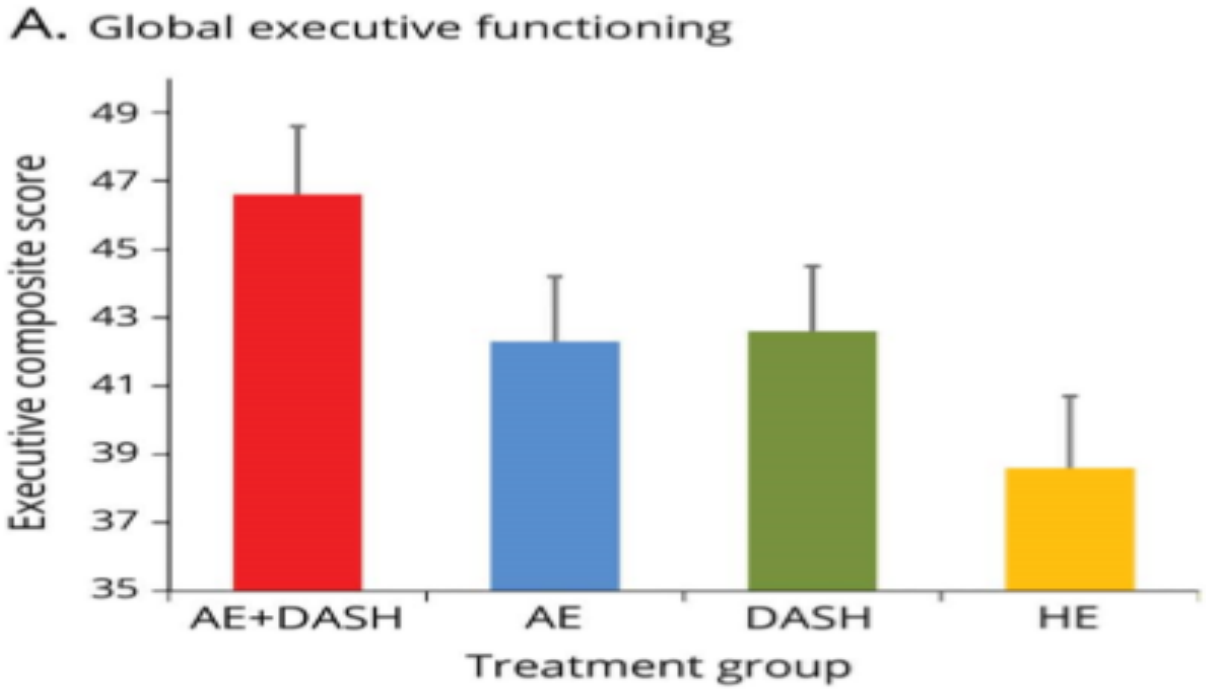



Livingston G et al, Lancet 2017

# Bénéfices de l’exercice aérobique et d’une alimentation saine

-Programme sur 6 mois d’exercices aérobies et/ou alimentation saine type DASH

-160 patients avec  des risques cardio-vasculaires et des troubles cognitifs légers,
âge moyen 65 ans




Blumenthal JA et al, Neurology 2019