Interdisziplinäre Reihe
Geriatrie und
Alterstraumatologie

Trainingsinterventionen bei Hüftbruchpatienten

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Klinik für Geriatrie

Interessenkonflikte: Keine

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Geschichte Kraft-Training

- 1835-1920: Dr. Gustav Zander
- 1865-: Max Herz
- 1820-1884: Archibald Mc Laren
- 1904: Freikörperkultur (Müller)
- 1867-1925: Eugen Sandow
- 1836-1937 Pierre de Coubertin / 1891 1. Olympische Spiele
- 1954 American College of Sport Medicine (ACSM)
- 1975 Dr K.Cooper Aerobics
- 1926-2007: Dr. A.Jones Nautilus MaschinenMedX
- 1972 Center for Exercise Science/ University of Florida
- 1967 Kieser
- 2006 Initiative: Exercise is Medicine (AMA and ACSM)
- 2015 Balgrist Campus

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Ziel: Uebungsprogramme auf Typ II Muskelfasern ausgerichtet

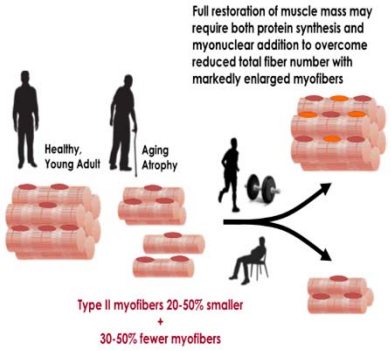


Figure 3. Conceptual Model of Aging Muscle Atrophy and the Impact of Progressive Resistance Exercise Training

abolism 23, 2016: 1034-47

Muscle strength increased by 113±8 percent in the subjects who underwent exercise training, as compared with 3±9 percent in the nonexercising subjects (P<0.001). Gait velocity increased by 11.8±3.8 percent in the exercise weakness and physical frailty in very elderly people. In contrast, multinutrient supplementation without concomitant exercise does not reduce muscle weakness or physical frailty. (N Engl J Med 1994;330:1769-75.)

THE decline in muscle strength and mass during aging[1,2] has been linked to physical frailty, falls, functional decline, and impaired mobility in very elderly people.[3-5] Although many factors, including chronic illness, a sedentary lifestyle, nutritional deficiencies, and aging itself, may contribute to muscle weakness and loss of skeletal-muscle mass in people of advanced age,[6-10] currently only skeletal-muscle disuse[11,12] and undernutrition[13-15] are potentially preventable or reversible with targeted interventions.

Muscle dysfunction associated with malnutrition may improve with nutritional supplementation in younger patients.[16,17] Even in healthy elderly men, a multinutrient supplement augmented muscle hyper-

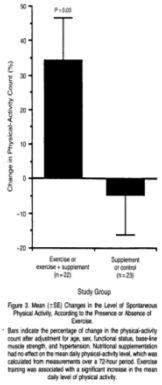


Figure 3. Mean (±SE) Changes in the Level of Spontaneous Physical Activity, According to the Presence or Absence of Exercise.

Bars indicate the percentage of change in the physical-activity count after adjustment for age, sex, functional status, base-line muscle strength, and hypertension. Nutritional supplementation had no effect on the mean daily physical-activity level, which was calculated from measurements over a 72-hour period. Exercise training was associated with a significant increase in the mean daily level of physical activity.

Community dwelling Seniors:

JAMA,2013(309):1406-07

Evidence Profile

No. of randomized trials: 159

Study years: 1990-2011

No. of participants: 79 193

Men: 23 758 (30%) Women: 55 435 (70%)

Race/ethnicity: Unavailable

Age, mean (range): 75 (51-101) years

Setting: Community

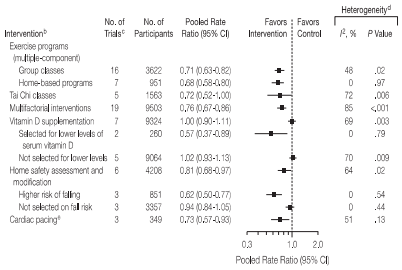
Countries: Australia, Austria, Belgium, Brazil, Canada, Chile, China, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, Taiwan, Thailand, United Kingdom, United States

Comparison: Intervention to prevent falls vs control group

Primary outcomes: Rate of falls; number of fallers

Secondary outcomes: No. of participants sustaining fall-related fractures

Figure. Rate Ratios (All Falls) for Selected Fall-Prevention Interventions vs Control in Community-Dwelling Older People[a]



[a] Based on data from Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Sys Rev*. 2012;(9):CD007146. doi:10.1002/14651858.CD007146.pub3. Absolute numbers for analyses are not provided because the absolute number of falls in each group was not always available. For these analyses, the "absolute number" was a rate of falls, eg, falls per person-year, or in some cases a reported rate ratio.

[b] Control groups received no intervention, usual care, or an intervention that was not expected to reduce falls, eg, social visits.

[c] The number of trials does not add to 159 because not all of the trials evaluated in the Cochrane review are summarized here.

[d] Variation across the results from individual studies due to clinical and/or statistical diversity. A *P* value <.10 represents a statistically significant variation. I^2 measures the variation in results between studies that is due to heterogeneity rather than sampling error (chance) (range, 0%-100%).

[e] For people with carotid sinus hypersensitivity and history of syncope and/or falls.

Effectiveness of two year balance training programme on prevention of fall induced injuries in at risk women aged 75-85 living in community: Ossébo randomised controlled trial

Fabienne El-Khoury,[1,2,3] Bernard Cassou,[4,5,6] Aurélien Latouche,[7] Philippe Aegerter,[4,5,8] Marie-Aline Charles,[2,3] Patricia Dargent-Molina[2,3]

Table 2 | Consequences of falls and estimates of effect intervention (two year balance training programme for prevention of fall induced injuries) in women aged 75-85

Consequences	Control (n=354)	Exercise (n=352)	HR* (95% CI)
Total No of falls (rate†)	640 (0.92)	533 (0.79)	0.88 (0.77 to 1.00)
No of participants who had at least one fall	222	189	–
No of injurious falls (rate†):			
Total	397 (0.56)	305 (0.45)	0.81 (0.67 to 0.99)
Moderate	310 (0.44)	237 (0.35)	0.81 (0.65 to 1.00)
Serious	87 (0.12)	68 (0.10)	0.83 (0.60 to 1.16)
No of participants who had at least one injurious fall	189	170	–

*Hazard ratio (adjusted for centre) computed with a "shared frailty" model. All women were included in analysis until their last time point. Covariance for random effect: 0.17 (SE 0.04; P<0.001) for all falls; 0.53 (SE 0.09; P<0.001) for injurious falls; 0.57 (SE 0.10; P<0.001) for moderate injurious falls; 0.35 (SE 0.25; P=0.30) for severe injurious falls.

†Rate per woman year=total number of events (fall related outcomes) divided by total number of woman years of follow-up in each group.

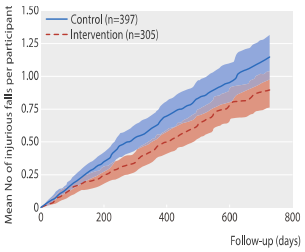


Fig 3 | Mean cumulative function (MCF) for two comparison groups: mean number of injurious falls in women aged 75-85 in two year balance training programme for prevention of fall induced injuries (intervention) or no such programme (control)

BMJ 2015;351

DO-HEALTH
Exercise Programm

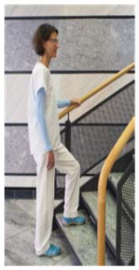
- Heben Sie anschliessend das linke Bein und halten das Gleichgewicht auf dem rechten Bein 10 Sekunden lang
- Versuchen Sie das Becken gerade zu halten

Wie oft?

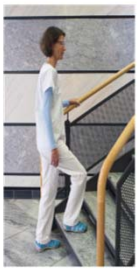
- Wiederholen Sie den Einbeinstand 10 Mal mit jedem Bein abwechselnd zwischen dem rechten und dem linken Bein. Pausieren Sie anschliessend 15 Sekunden.
  Glückwunsch: Übung Nr. 2 ist abgeschlossen!

Übung 5
Beinkräftigung (fortgesetzt)

- Nehmen Sie das rechte Bein wieder von der Stufe herunter
- Das linke Bein sollte auf der Stufe bleiben



- Führen Sie dieses Hinauf- und Hinuntersteigen mit dem rechten Bein 10 Mal aus
- Das linke Bein bleibt dabei immer auf der Stufe
- Steigen Sie dann mit beiden Beinen wieder auf den Boden zurück. Sie befinden jetzt sind Sie wieder in der Ausgangsstellung
- Bitte versuchen Sie den Oberkörper immer aufrecht zu halten
- Führen Sie die Übung mit dem linken Bein durch



Beyer N et al: Arch Intern Med 2010;170(9):813-20.

Effects of a Supervised versus an Unsupervised Combined Balance and Strength Training Program on Balance and Muscle Power in Healthy Older Adults: A Randomized Controlled Trial

André Lacroix[a] Reto W. Kressig[b] Thomas Muehlbauer[a] Yves J. Gschwind[b]
Barbara Pfenninger[c] Othmar Bruegger[c] Urs Granacher[a]

[a]Division of Training and Movement Sciences, University of Potsdam, Potsdam, Germany; [b]University Center for Medicine of Aging, Felix Platter Hospital, Basel, and [c]Swiss Council for Accident Prevention, Bern, Switzerland

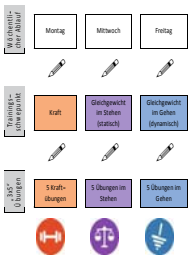
Trainingsprogramm zur Sturzprävention

Das Trainingskonzept «3 x 5»

Trainingsphase

Gesamtdauer	12 Wochen
Trainingstagepro Woche	3 (z. B. Montag, Mittwoch, Freitag)
Trainingszeit	Freiwillig, gleichbleibend für alle die Übungen festen Terminfestlegen (z. B. Mo, Mi, Fr 8:00 – 11:30 Uhr)
Dauer pro Einheit	30 min

Beispiel einer Trainingswoche



Offene Fragen???

- Wirksamkeit des DO-HEALTH Exercise Programms bei Prefrail Senioren in der Primärprevention von Stürzen und Verletzungen/Frakturen
- Art und Intensität des Muskelkräftigungstrainings zur Förderung der Typ II MF
- Art und Intensität eines sicheren Gleichgewichtstrainings
- Art von Supplementen und muskelanabolen Substanzen
- Gruppen oder Home based exercise
- Möglichkeiten der Steigerung der Adherence mit Optimierung der Kommunikation im Reha-Team mittels Digitalisierung und Internet