

Explanation slides series in article “Longitudinal (1976–2006) study in 5 Dutch Recreation Sports Groups”.

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Slide 2. During **30** years 49 women and 62 men (n =111) were tested in the Sportcenter of the University of Nijmegen (Netherlands) in the Department of Exercise Physiology (1976-2006).

The subjects were regularly controlled for Body Composition, VO₂max, Blood pressure and Training activities (Telemetry). During the whole period 4 questionnaires were completed by the participants.

Slide 3. An **example** of answers from a questionnaire (01-12-2005).

Composition of Recreational sport groups: 2 Women and 3 Men groups.

Main activity: running outdoors/jogging.

Women: (n=29). Average Age: 61,5 years (sd=6,6 yr).

Men: (n=28). Average Age: 66,2 years (sd=8,5).

Average training frequency per week: 2,43 (sd=1,3) for **women** and 2,53 years (sd=0,7) for **men**.

Slide 4. Methods:

1. **Body Composition:** Height (0,5 cm), Weight (0,1 kg), Sum of 4 Skinfolds (Method of Durnin), Percentage Body Fat (calculation), Fat Free Mass (calculation), Blood pressure in rest (Riva-Rocci).

2. **VO₂max**, method of Åstrand. In L.min⁻¹; in ml.kg⁻¹.min⁻¹ and in ml.kgffm⁻¹.min⁻¹.

3. **Telemetry.** Use of heart rate monitor (Polar).

4. **Questionnaire.** Will be discussed in this presentation.

5. Incidental measured: **Explosive strength** (Vosjump).

Slide 5. Average Training time per session:

Women: 59,7 minutes (sd 4,4) and **Men:** 68,6 minutes (sd 16)

Training intensity per session:

Women: Light (n=10); Average (n=17); Heavy (n=2).

Men: Light (n=8); Average (n=20); Heavy (n=0).

Average Age parents died:

Women (n=26) Mother = 74,7 yrs(sd 14) and (n=22) Father = 72,4 yrs (sd 12,7).

Men (n=23) Mother = 77,5 yrs (sd 9,3) and (n =26) Father = 74,9 yrs (sd 10,6).

Slide 6. Percentage Body Fat (%) measured in Men in Recreational Sport groups, **longitudinal** data are compared with **transversal** group data.

Longitudinal groups are living in the city of Nijmegen and surroundings, transversal groups we measured once and came from all over the country of Holland. For the age group between 70 and 80 years of age there were not enough people (Untrained) available to be measured.

Conclusion: There is hardly any difference between the longitudinal and transversal groups men and women.

Slide 7. Another example. In this graph the data of **Longitudinal Recreation sport groups (2) Women** are compared with **Transversal Recreational groups of Women** concerning the sum of 4 skinfolds (mm), Method Durnin. Also here not enough untrained subjects ageing 70 to 80 years were available to be measured.

Conclusion: There is a very small difference in result between longitudinal and transversal groups.

Slide 8. Another example. In this graph data of **Longitudinal Recreational sport groups (2) Women** are compared with **Transversal Recreational sport groups Women** concerning **VO₂max** expressed in ml.kgffm.min, that means maximal oxygen uptake per **kg fat free mass (kgffm)**. Also here not enough untrained transversal group Women available.

Conclusion: Only in the age group of 33 years there is a slight increase of VO₂max in the Transversal group.

Slide 9. An example of comparison **Recreational Women** with **Untrained Women** for **Percentage Body Fat (%)**. Also here not enough untrained transversal group Women available.

Conclusion: Untrained Women in all age groups showed higher scores in % Fat than **Recreational Women**. Untrained Women (average 45 years) reaches scores that Recreational Women sport groups shows only around 60 years of age!

Slide 10. Recreational sport groups Men compared with **Untrained Men** for **VO₂max(ml.kg.min)**.

Conclusion: Recreational sport groups Men have far more **higher** VO₂max values (ml.kg.min) than Untrained Men. Regular sport shows as a result much better general endurance in Recreational sport groups Men. The Untrained Men of round 30 years shows the same values as a 50 year old Recreational sport group Men.

Slide 11. Recreational sport groups Women shows, compared to Untrained Women, remarkable better **VO₂max (ml.kg.min)** values, just like in **slide 10** for Men.

Conclusion: Untrained Women of average 40 years are on the same level as **Recreational sport groups Women**, ageing 60 years! The results are comparable to Men like in slide 10, only the effect arrives later.

Slide 12. Recreational sport groups Men compared with **Untrained Men** for VO₂max (ml.kgffm.min), that means body weight minus body fat.

Conclusion: Recreational sport groups Men shows higher VO₂max than **Untrained Men**. Untrained Men around 30 year of age shows the same result in VO₂max as 50 year old **Recreational sport groups Men!**

Slide 13. Several answers from the last questionnaire are summarized in the review below. Questions are in bold.

Average alcohol consumption in glasses per week?

Women: (n=21), average 9,6 glasses (sd=6,7) per week and

Men: (n=22), average 9,3 (sd=7,6) per week.

Conclusion: Men and Women in all 5 groups are close to each other concerning the use of alcohol.

Attention for good food/drinking habits?

Women: (n=27), Yes I do and (n=2) No I do not.

Men: (n=25), Yes I do and (n=3) No I do not.

Extra vitamins/minerals as food supplement ?

Women: (n=14) Yes and (n=15) No.

Men: (n=8) Yes and (n=20) No.

Slide 14. During the night, sanitary stops?

Women: (n=23) Yes and (n=6) No. Men: (n=22) Yes and (n=6) No.

Menopause complaints?

Women: (n=10) Yes and (n=18) No.

Prostate gland complaints?

Men: (n=5) Yes and (n=23) No.

Dizziness/dyspneu ?

Women: (n=2) Yes and (n=27) No. Men: (n=1) Yes and (n=27) No.

Are you often dizzy after training?

Women: (n=1) Yes and Men: (n=0) Yes.

Slide 15.

Smoking Habits:

Women Yes: (n=2) 1-5 cigarettes a day and Men Yes: (n=1) 1-5 cigarettes a day.

Ankles Edema:

Women (n=2) and Men (n=0)

Occupation “Sitting”:

Women: (n=10) and Men (n=20)

Occupation “Moving”:

Women: (n=19) and Men (n=8)

Slide 16.

Complaints:

Complaints	Women (n=....)	Men (n=.....)
Hip/knee/ankle	8	15
Neck/Shoulder	9	7
High Blood pressure	6	5
Low back pain	3	8
Arthrose/Arthritis	3	7
Muscles soreness	2	7

Slide 17. Continue after slide 16, Complaints...

Complaints	Women (n=....)	Men (n=.....)
Eyes/ears	2	7
Heart (angina pectoris)	1	5
High cholesterol	3	3
Asthma/COPD	1	3
Stomach/Intestines	2	1
Stroke/TIA	0	1

Conclusions Slides 16 and 17.

Regular exercises has clear benefits to increase your general endurance capacity and keep % fat low compared to Untrained subjects in the same age group, but physical complaints does not distinguish clear from Untrained people.

Slide 18. Recreational sport groups **men and women** commit also other types of sports activity than only running/jogging. See Table below.

Other sports	Women	Men
Walking	3	13
Cycling	3	12
Fitness	11	3
Tennis	5	4
Swimming	1	3
Skating/Skeelering	1	1

Slide 19. Hf. registration (Polar) of a Recreational runner. Hfmax = 161 bpm. During this training run average Hf.=155 bpm, close to his personal maximum. In other words he was running too fast, too much competition pace instead of training run (bpm = beats per minute).

Slide 20. Just after the start this Recreational runner starts after only 7 minutes already to walk because he started too fast. Than a few minutes rest and again running too fast, so 7 times after each other he did !

He runs all the time close to his personal maximum of 160 bpm and has to drop down his pace. His Hf.max was like a 'wall' against his runs all the time again. This was surely not a training run but a maximal run.

Slide 21. In this graph **average year values** for the **time** during training endurance runs (distance 8,4 km) are mentioned. Long time the average time lies around 42 minutes but last few years the average time increases.

The **decrease in average Hf.** is normal because of ageing of the runner. Unfortunately there are only few data available studying longitudinal effects of ageing in relation to regular training. This runner was 49 years when he started to collect data. At the moment

1000 endurance runs are behind and you can find the graph results back in this website in the article “Effect van duurtraining op lange termijn”.

Slide 22.

Conclusions total investigation:

1. **Main Motives** for Recreation Sports activities are: **A. Fun to be active and moving. B. Health motive and C. Social contact.**
2. Main reasons **training omission**: A. Injury. B. Illness. C. No time; work.
- 3a. **VO2max**(L.min;ml.kg.min and ml.kgffm.min) **declines** in **Longitudinal Men** Groups: 0,92 % ; 1,03 % and 0,80 % per year between 27 and 65 years of age; in **Untrained Men** resp. 1,13 %; 1,08 % and 0,97 % per year.

Slide 23.

Conclusions continued after slide 22

- 3b. **VO2max**(L.min;ml.kg.min and ml.kgffm.min) **declines** in **Longitudinal Women** Groups: 0,95 % ; 1,13 % and 0,87 % per year between 27 and 65 years of age; in **Untrained Women** resp. 1,11 %; 1,18 % and 0,92 % per year.
4. **Percentage Body Fat** (%) **inclines** in **Longitudinal Men** Groups: 1,71 % per year between 27 and 65 years of age; in **Untrained Men** 1,13 % per year.

Slide 24.

Recreational sport groups Men and Women compared with **Untrained Men and Women** for **VO2max** expressed in L.min; ml.kg.min and ml.kgffm.min ageing 27 to 65 years. The average decline per year is mentioned in % and is less strong than in **Untrained Men and Women**.

Slide 25.

Increase in % Fat expressed in % per year in age groups between 27 and 65 years are shown in this graph. In Men there is a remarkable difference between **Recreational** and **Untrained Men**.

Slide 26.

Typical for overweight or obese men is the so called “apple-shape” shown in this picture.

Slide 27.

Conclusions continued after slide 22 and 23.

5. **Percentage Body Fat** (%) **inclines** in **Longitudinal Women** Groups: 1,13 % per year between 27 and 65 years of age; in **Untrained Women** 0,87 % per year.
6. **Fat Free Mass** (kg) **declines** in **Longitudinal Men** Groups: 0,24 % per year between 27 and 65 years of age; in **Untrained Men** 0,25 % per year.
7. **Fat Free Mass** (kg) **declines** in **Longitudinal Women** Groups: 0,19 % per year between 27 and 65 years of age; in **Untrained Women** 0,29 % per year.

Slide 28.

Men and Women Recreational sport groups and **Untrained Men and Women** are compared for **decrease in FatFreeMass (=FFM)** expressed in % per year in the age

groups 27 to 65 years. Especially in Women we see a remarkable difference between the two groups.

Slide 29.

Conclusions continued after slide 22,23 and 27.

8. **Regular supervision** concerning **heart rate** monitoring (**telemetry**) during activities are recommended.

9. **Regular** exercise physiology **tests** were highly appreciated in all groups.

10. **Regular** training, **variation** in exercises, **low/average intensity** and **interval** training are **key** conceptions for successful training with recreation sports groups.

Slide 30.

We thanks Mr.Era Sr. from the north of Finland for his support!!

Summary: The results of the longitudinal study done during 1976 – 2006 in 5 Recreational Sport Groups (2 Women and 3 Men) are presented in the 18th Nordic Congress of Gerontology, 28-31 May,2006 in the University of Jyväskylä, Finland. The Power Point presentation and text explanation are mentioned on this website.

Conclusions: Our longitudinal data can be compared with transversal data, there was hardly any difference between them. In terms of general endurance (expressed by VO2max) the benefits of **regular** training in Recreational sport groups shows for men and women much better results than in Untrained men and women. Also for % Fat the Recreational groups were in better shape than Untrained subjects. Results of **blood pressure** measuring (in rest) showed **no** difference in time for Recreational sports groups in Men and Women. Besides these physiological advantages we found that also in Recreational groups a lot of physical complaints occurred. (See results **questionnaire**). In this matter they distinguish not from Untrained Men and Women. More results in detail with many graphs are published in “Ergometrie en trainingsbegeleiding”, 6th press, Publisher: Nederlands Paramedisch Instituut, Amersfoort, 2007. See for details further on this website.