

The 2nd annual ENoLL meeting at Snowpolis 17.-18.9.2009

**Activate people with new technology is
a challenge and a chance**

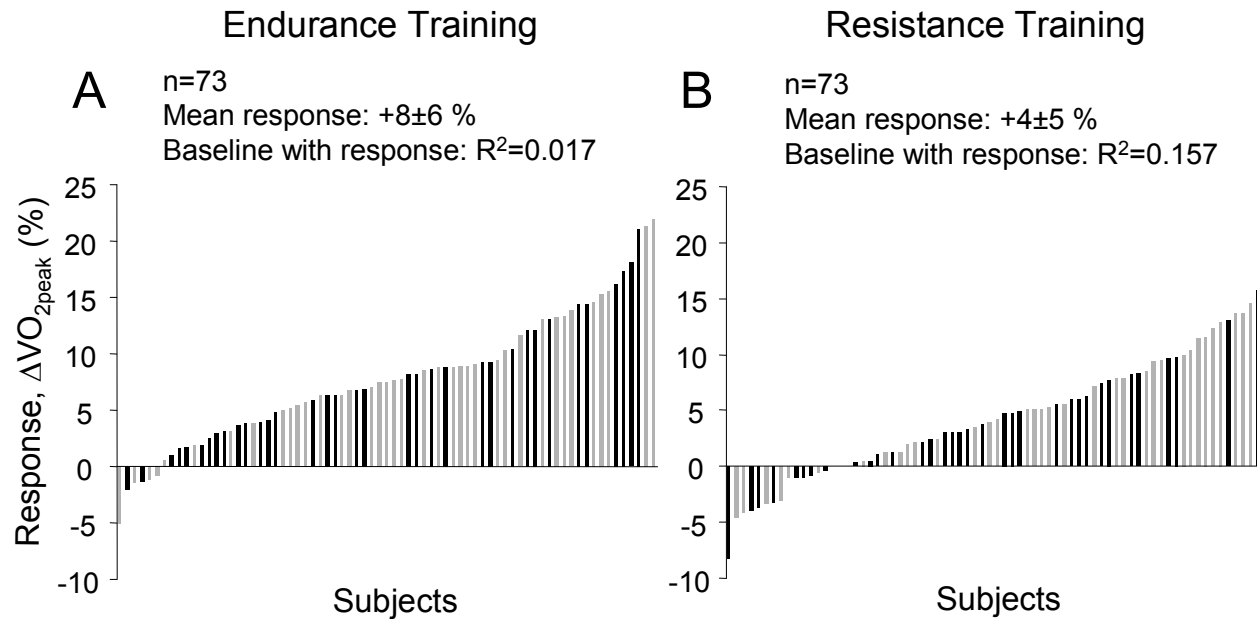
**18.9.2009
Dr. Raija Laukkanen**

POLAR
LISTEN TO YOUR BODY

Content

- Individual training response
- Development of fitness wrist technology
- Training with technology; scientific evidence
- User feedback and motivation

Individual training response



Hautala et al. EJAP Vol 96;5, 2005

Development of wrist technology



HRM



HRM with guiding features



HRM with guiding program



Training computer with guiding programs



Activity monitors

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LISTEN TO YOUR BODY

Study on HR monitor with adaptive weight management program





NM Byrne et al. Weight Loss Strategies for
Obese Adults: Personalized Weight Management
Program vs. Standard Care.
Obesity, October 1, 2006, 14(10): 1777-88.

Queenslands University of Technology, School of Human Movement Studies, Faculty of Health in Brisbane, Australian collaboration with Dr. Robert Ross from the Queens University, Kingston, Ontario, Canada, Dr. Mikael Fogelholm from the UKK Institute, Tampere, Finland and Dr. Raija Laukkanen Polar Electro Oy and University of Oulu, Oulu, Finland



Aims of the study

- Examine how effective personalized Polar weight management product is in weight loss in overweight adults
- Compare product to standard care given by Australian health care personnel on weight reduction
- Evaluate product by overweight persons

Real Health & Fitness Opportunity

Motivated Volunteers Required

QUT's School of Human Movement Studies is looking for motivated people to participate in exercise training studies.

The program is designed to assist you to increase your health-related fitness levels and to develop skills to maintain weight loss after this study is finished.

In order to participate you must meet the following criteria:

- 30–45 years of age with little regular exercise (ie less than 30 minutes of intentional moderate physical activity per week in the past 12 months, including work-related physical activity)
- a body mass index (BMI) of 27–32 kg/m² (to calculate BMI, simply divide your body weight in kilograms by the square of your height in metres)
- non-smoker and weight-stable (± 2 kg) for at least 6 months

Please note that women who are pregnant, lactating, planning to fall pregnant or post-menopausal during the program cannot participate.

More Information

If you are interested in participating or would like to know more, please phone Dr Jarrod Meerkin, QUT's School of Human Movement Studies, on 3864 5852 or email j.meerkin@qut.edu.au

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HLT 03-201

Queensland University of Technology
Victoria Park Road Kelvin Grove QLD 4059 Website: qut.com

Intervention groups

A. Polar weight management product group

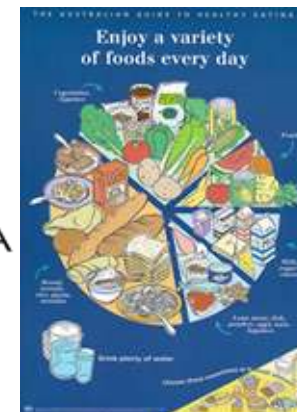
- WM4 product
- Polar education materials (nutrition & physical activity support)



WM41

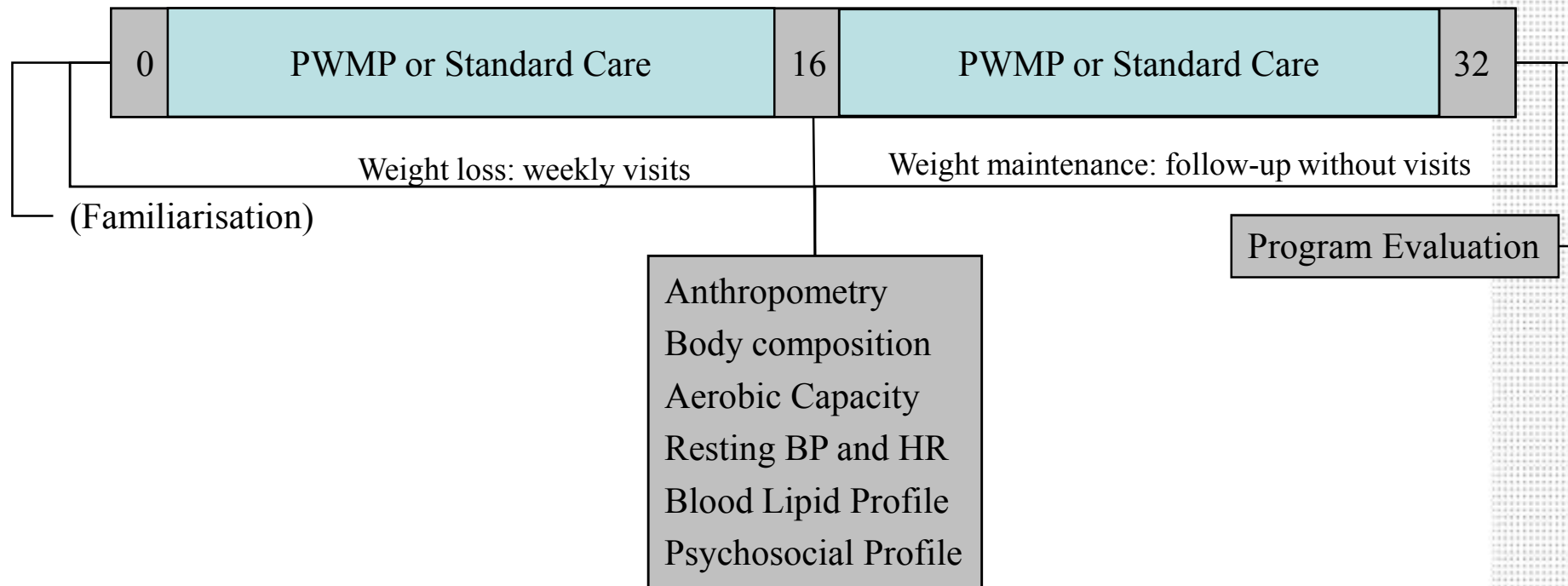
B. Standard Care group

- Advice in accordance with Australian National Physical Activity and Dietary Guidelines



Note: Randomized groups got the same standard care advice: aim to lose weight 1/2-1kg/week

Experimental Design (February-November 2003)



Byrne et al. 2006

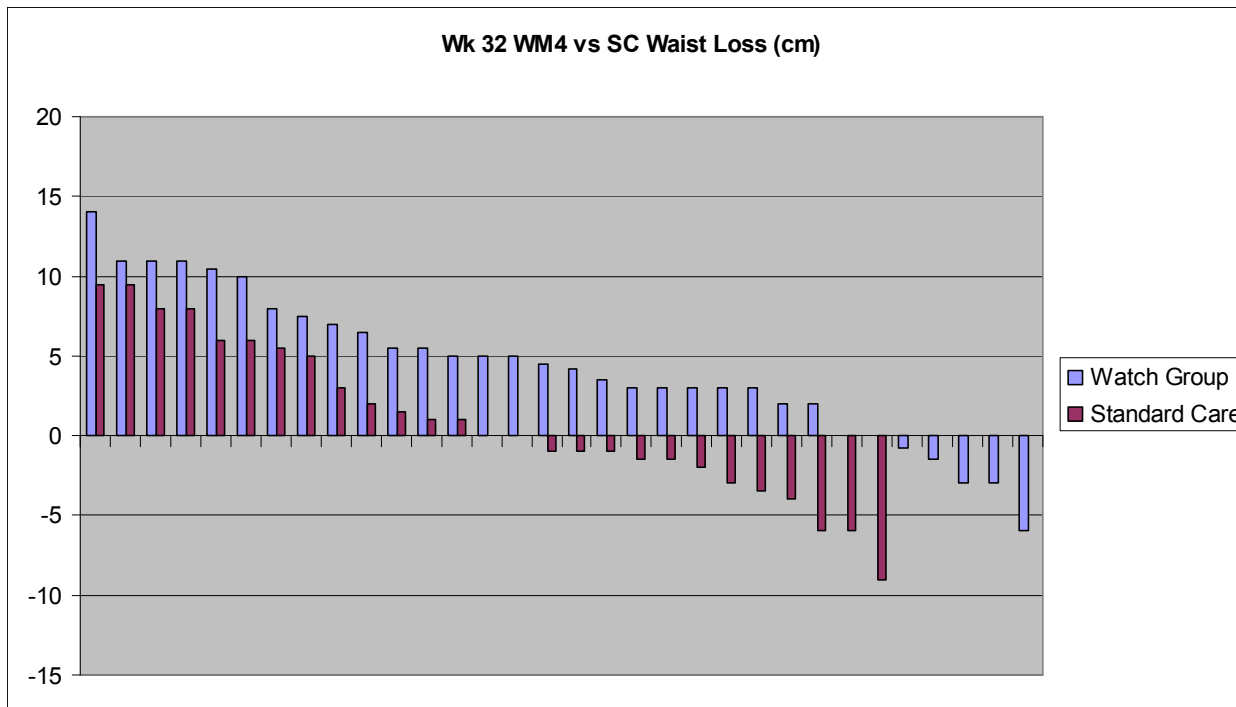
Baseline data in intervention groups

	WM4 (N = 40)	Standard Care (N = 34)
Age (yr)	37.3 (4.4)	37.6 (4.5)
Height (m)	1.74 (0.10)	1.71 (0.10)
Weight (kg)	88.8 (12.4)	85.9 (11.6)
BMI (kg/m ²)	29.3 (1.6)	29.3 (1.8)
Body Fat (%)	35.7 (7.5)	36.7 (9.1)

Data reported as mean (SD)

Byrne et al. 2006

Waist loss to week 32

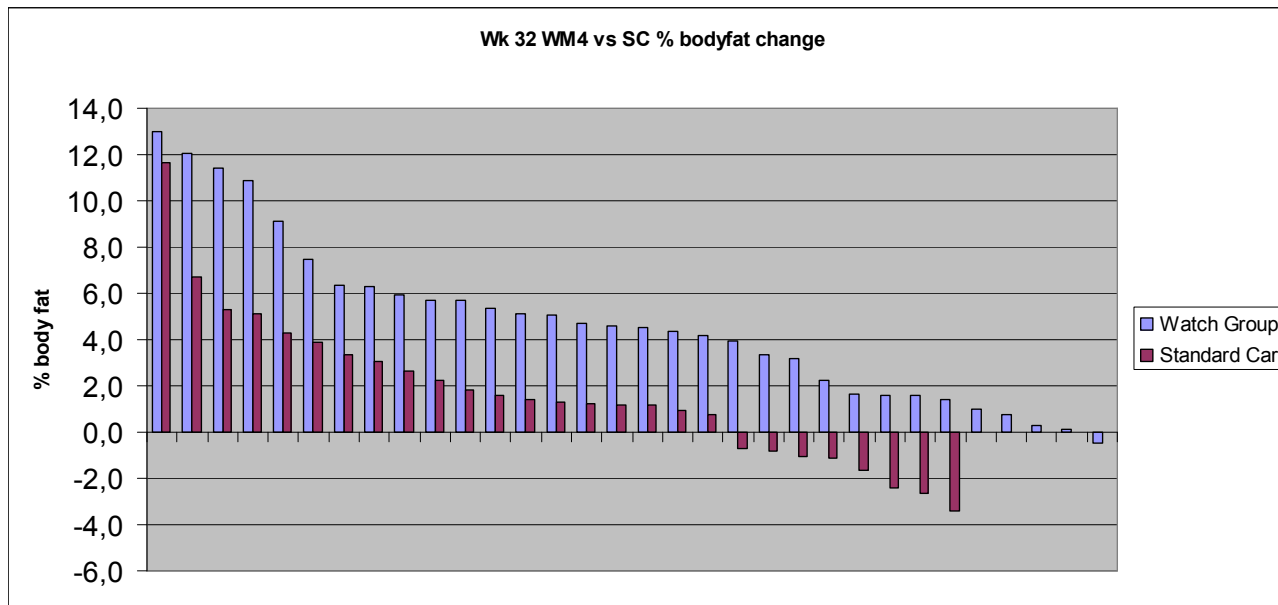


Data reported as individual values

Byrne et al. 2006



Body fat loss (%) to week 32

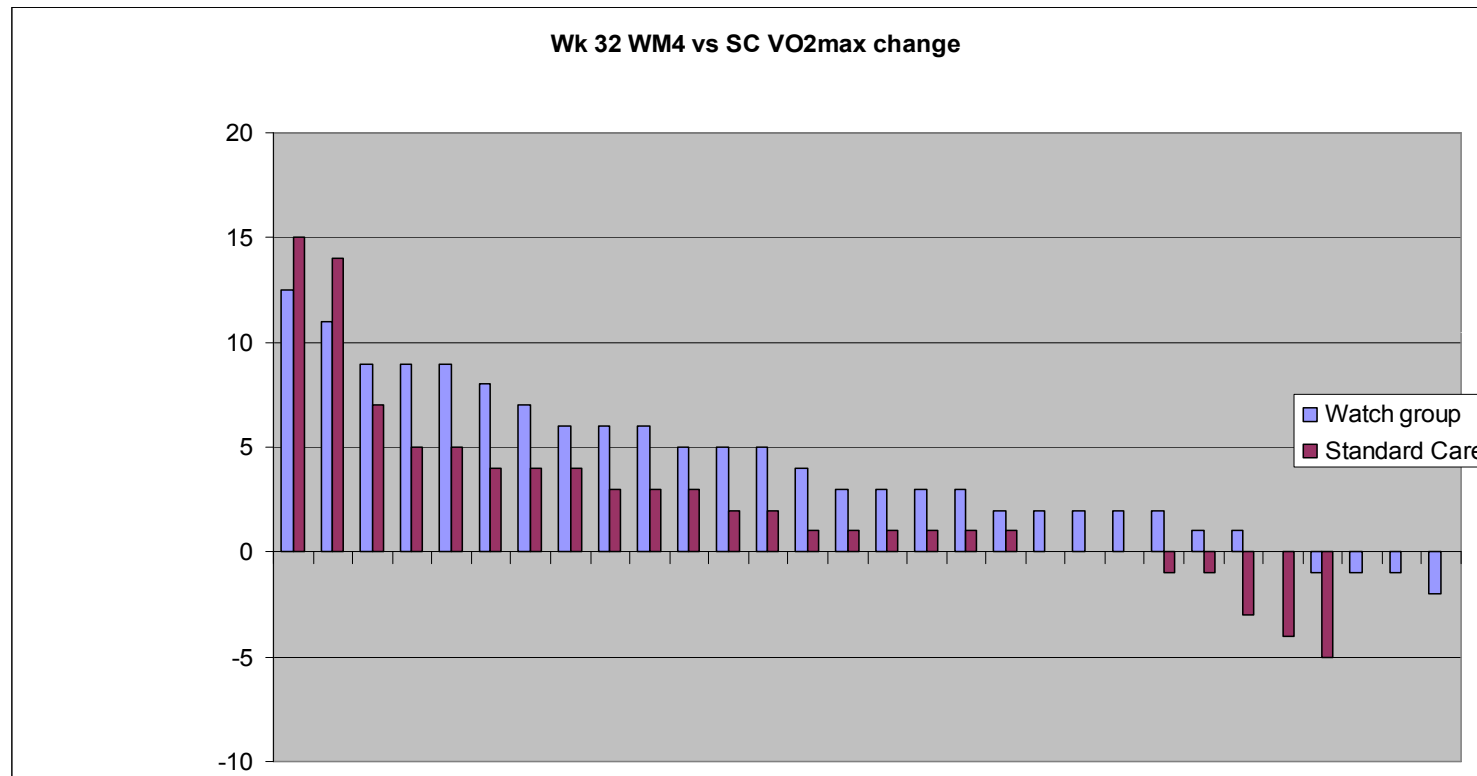


Data reported as individual values

Byrne et al. 2006



VO_{2max} change (ml/kg/min) to week 32



Data reported as individual values

Byrne et al. 2006



SUBJECT'S EVALUATION OF THE PRODUCT

Will you continue to use the product following the research study?

95% - yes

5% - probably

CONCLUSIONS

- Both groups did lose weight and body fat
- Polar group lost more weight, body fat and waist as well as improved more in aerobic fitness than standard care during 16 first weeks and this difference was still significant at 32 weeks
- Blood pressure or blood lipids did not change
- Subjects evaluation of the product was very good

Systematic review on pedometers

Using Pedometers to Increase Physical Activity and Improve Health A Systematic Review



Dena M. Bravata, MD, MS; Crystal Smith-Spangler, MD;
Vandana Sundaram, MPH; Allison L. Gienger, BA; Nancy
Lin, ScD; Robyn Lewis, MA; Christopher D. Stave, MLS;
Ingram Olkin, PhD; John R. Sirard, PhD

JAMA. 2007;298(19):2296-2304.

Sample

- 2246 citations; 26 studies with a total of 2767 participants met inclusion criteria (26 studies)
- The participants' mean (SD) age 49 (9) years and 85% were women.
- The mean intervention duration was 18 weeks.

Results (1)

- In the RCTs, pedometer users significantly increased their physical activity by 2491 steps/d than control participants (95% CI, 1098-3885 steps/d, $P < .001$).
- Among the observational studies, pedometer users significantly increased their physical activity by 2183 steps/d over baseline (95% CI, 1571-2796 steps/d, $P < .0001$).
- Overall, pedometer users increased their physical activity by 26.9% over baseline.

Results (2)

- An important predictor of increased physical activity was having a step goal such as 10 000 steps per day ($P = .001$).
- When data from all studies were combined, pedometer users significantly decreased their body mass index by 0.38 (95% CI, 0.05-0.72; $P = .03$). This decrease was associated with older age ($P = .001$) and having a step goal ($P = .04$).
- Intervention participants significantly decreased their systolic blood pressure by 3.8 mm Hg (95% CI, 1.7-5.9 mm Hg, $P < .001$). This decrease was associated with greater baseline systolic blood pressure ($P = .009$) and change in steps per day ($P = .08$).

Conclusion

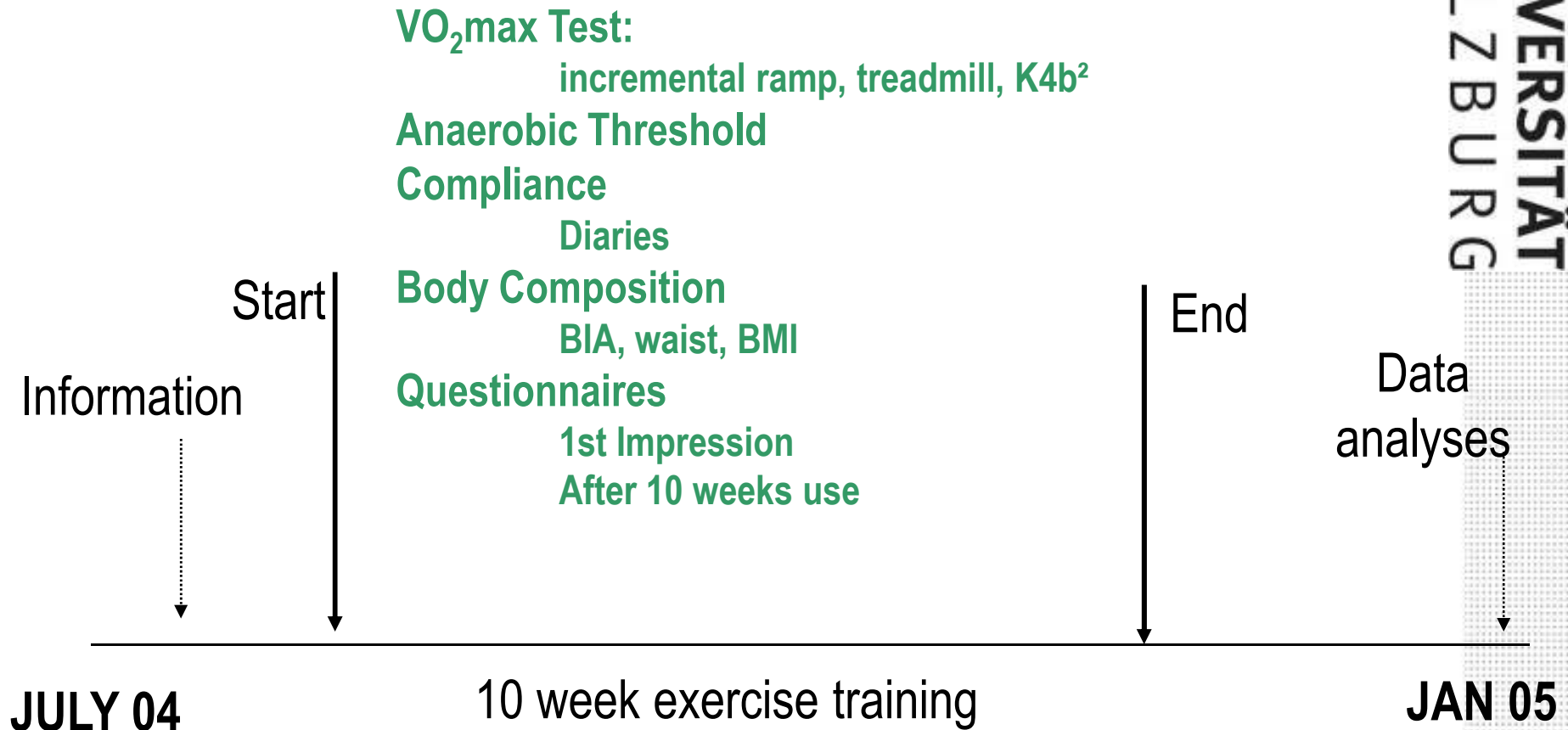
- The results of the review suggest that the use of a pedometer is associated with significant increases in physical activity and significant decreases in body mass index and blood pressure.

Ring-Dimitriou S, von Duvillard S, Stadlmann M,
Kinnunen H, Drachta O, Mueller E, Laukkanen R,
Hamra J, Weeks S, Peak K

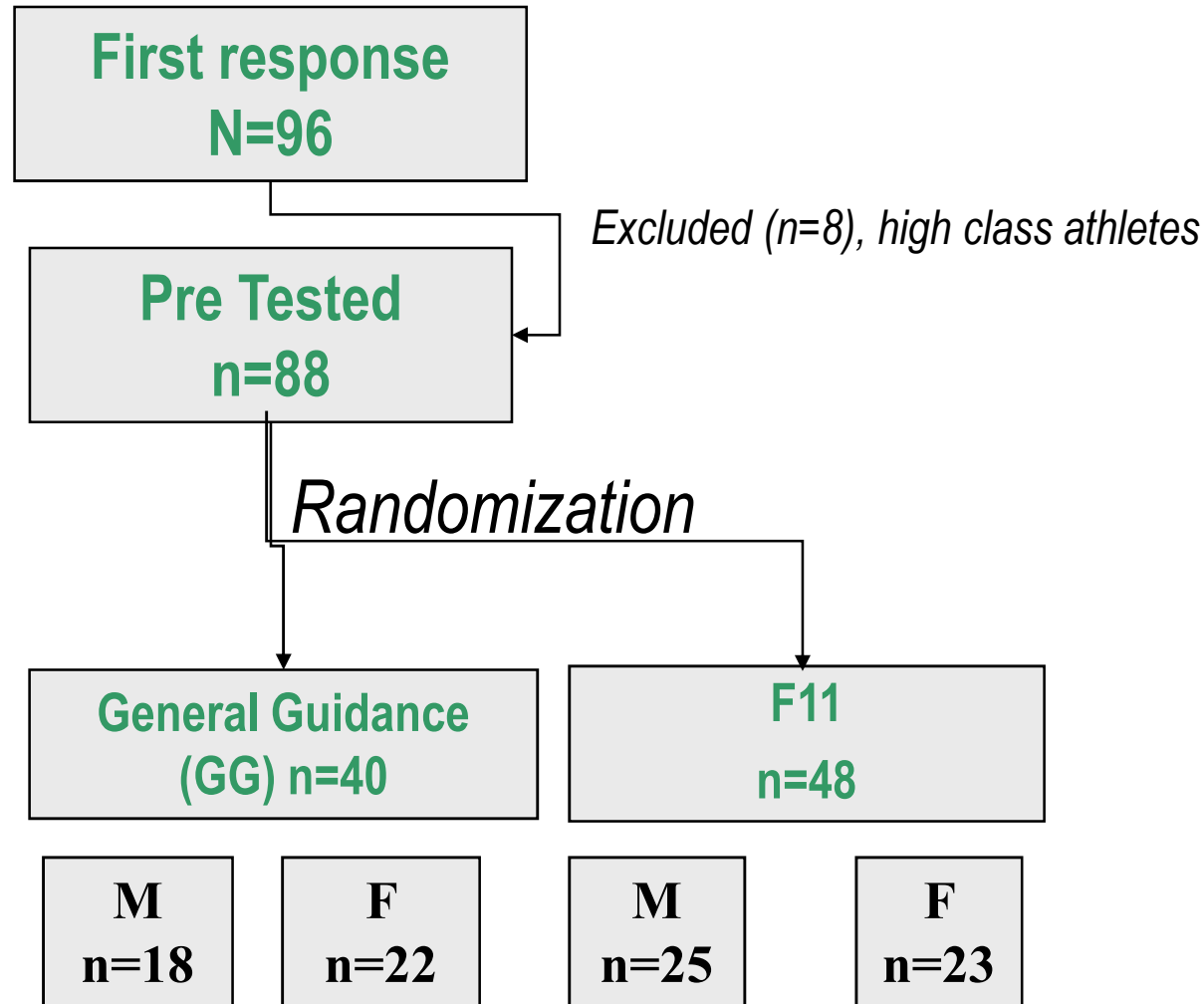
Changes in physical fitness in moderately fit adults
with and without the use of exercise telemetry
monitors

[Eur J Appl Physiol.](#) 2008 Mar;102(5):505-13. Epub
2007 Nov 17.

Study design



Methods: Subjects screening



Subjects: Baseline data (mean±SD)

	F11(n=38)	GG (n=32)
Age (years)	38.0 ± 4.9	39.7 ± 5.2
Weight (kg)	74.9 ±11.9	73.0 ±13.5
Height (cm)	174.5 ± 7.6	171.5± 7.7
BMI (kg/m ²)	24.5 ± 2.9	24.8 ± 4.0
Waist (cm)	89.1 ± 8.1	88.3 ±10.4
Fat (%)	21.4 ± 6.0	21.9 ± 7.2
VO _{2peak} (ml min ⁻¹ kg ⁻¹)	37.9 ± 7.4	39.5 ± 7.3

Methods: Training in F11 group



The F11 group did exercise 10 weeks by the Keeps U Fit using „improve“ or „maximize“ program with exercise duration, frequency and intensity guidance.

Methods: Training in GG group

ACSM GUIDELINES

for healthy aerobic activity ...

- Exercise 3 to 5 days each week
- Warm up for 5 to 10 minutes before aerobic activity
- Maintain your exercise intensity for 30 to 45 minutes
- Gradually decrease the intensity of your workout, then stretch to cool down during the last 5 to 10 minutes

If weight loss is major goal, participate in your aerobic activity at least 30 minutes for five days each week.

Example. 35 yr old female with VO_2 peak of 36 ml/min/kg was advised to exercise 90 to 180 min per week in 3-5 sessions at moderate intensity.

Ring-Dimitriou et al. 2007

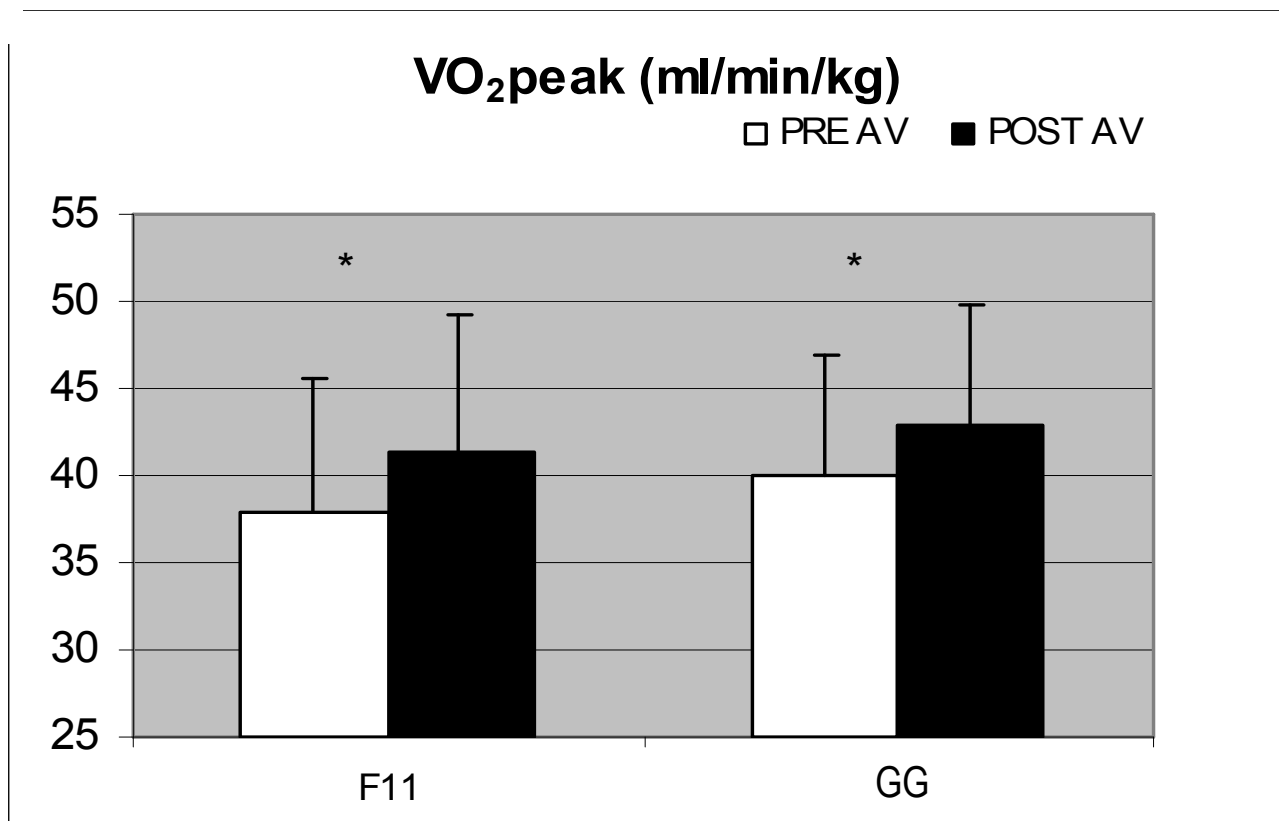
Results: Questionnaire (1st impr. after 3 d of use)

31% had no experience of HR monitors

Comments to wrist receiver (agreed or strongly agreed)

- 91% said receiver looks attractive
- 85% said receiver feels comfortable to wear
- 78% said icons are easy to understand
- 65% said graphics are illustrative

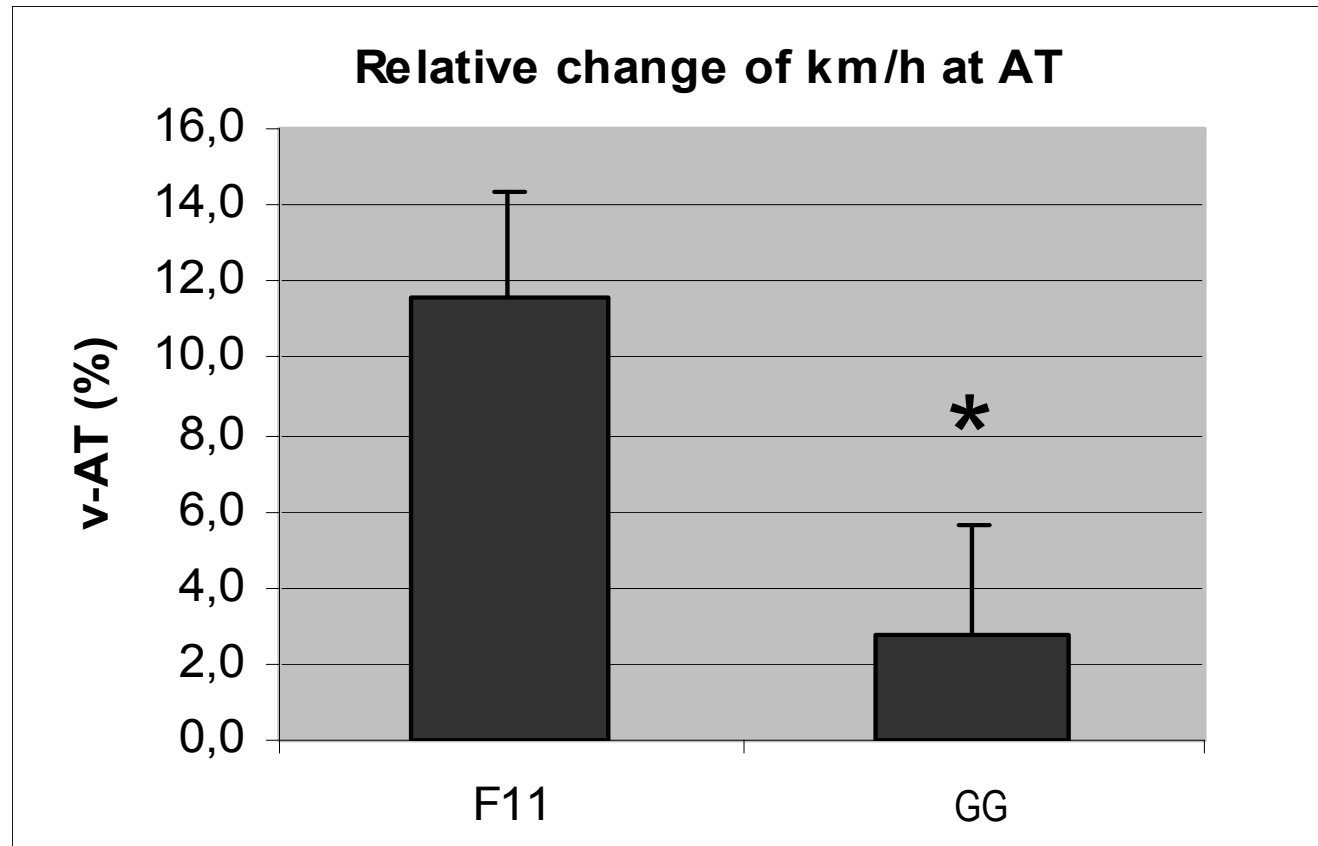
Results: Aerobic fitness



F11 group improved in aerobic fitness 9% and GG group 7%

Ring-Dimitriou et al. 2007

Results: Submaximal fitness



F11 group improved in submaximal fitness 11% and GG group 3%

Ring-Dimitriou et al. 2007

Results: Questionnaire (after 10 wk)

Product evaluation after training

- 81% thought that F11 made them train more wisely
- 78% agreed that program targets were suitable
- 78% agreed that intensities were right
- 70% thought that F11 made them train more regularly
- 64% agreed that program was easy to follow
- 57% agreed that they learned to train with different intensities

Conclusions

Polar F11 product and Keeps U Fit™ - Own Workout Program helped physically active individuals to **improve their aerobic fitness and submaximal running speed more** compared to general training guidance

Training with F11 resulted fitness improvements with lower total training volume

Conclusions

- Technology can help and motivate people for physical activity and for fitness and health changes
- Strongest evidence on power of technology exist on pedometers
- Wrist technology is most attractive to physically active people

- Author conclusion comment: *Physical activity and exercise guidelines by leading authorities can affect on the acceptance and use of technology*

Thank you!

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