

The next step - merge of m-health technologies for healthy and sick people

Prof. Oleg Medvedev

FRUCT 14

Helsinki - 2013

Whole-system
efficiency
improvement

Information and
self-help

Public health
research

Primary care

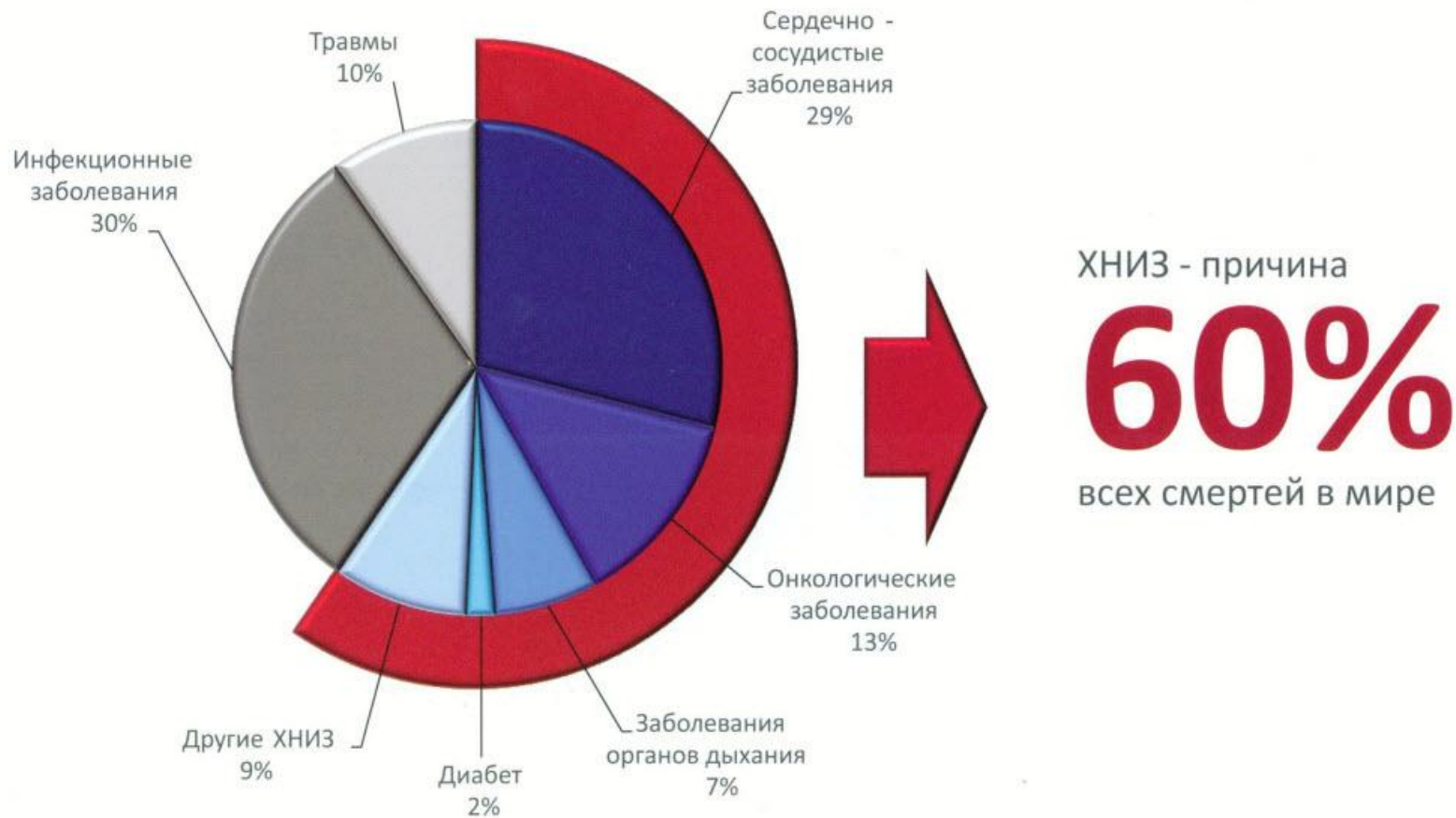
Management of
long-term
conditions

Emergency care

Main Gap

These mHealth applications are emerging in response to opportunities and needs that are similarly diverse, including the threat of pandemics; globalisation and population mobility;

Хронические неинфекционные заболевания (ХНИЗ) – основная причина смертности в мире¹



¹ Источник: Global Health Observatory Database <http://apps.who.int/ghodata>

4 основных фактора риска смертности от ХНИЗ

Факторы риска

Табак

Алкоголь

Неправильное питание

Низкая физическая активность

Вклад

Совокупное влияние 4-х факторов риска, %

61%

35%

42%

44%

Смертность от ХНИЗ¹

Сердечно-сосудистые заболевания

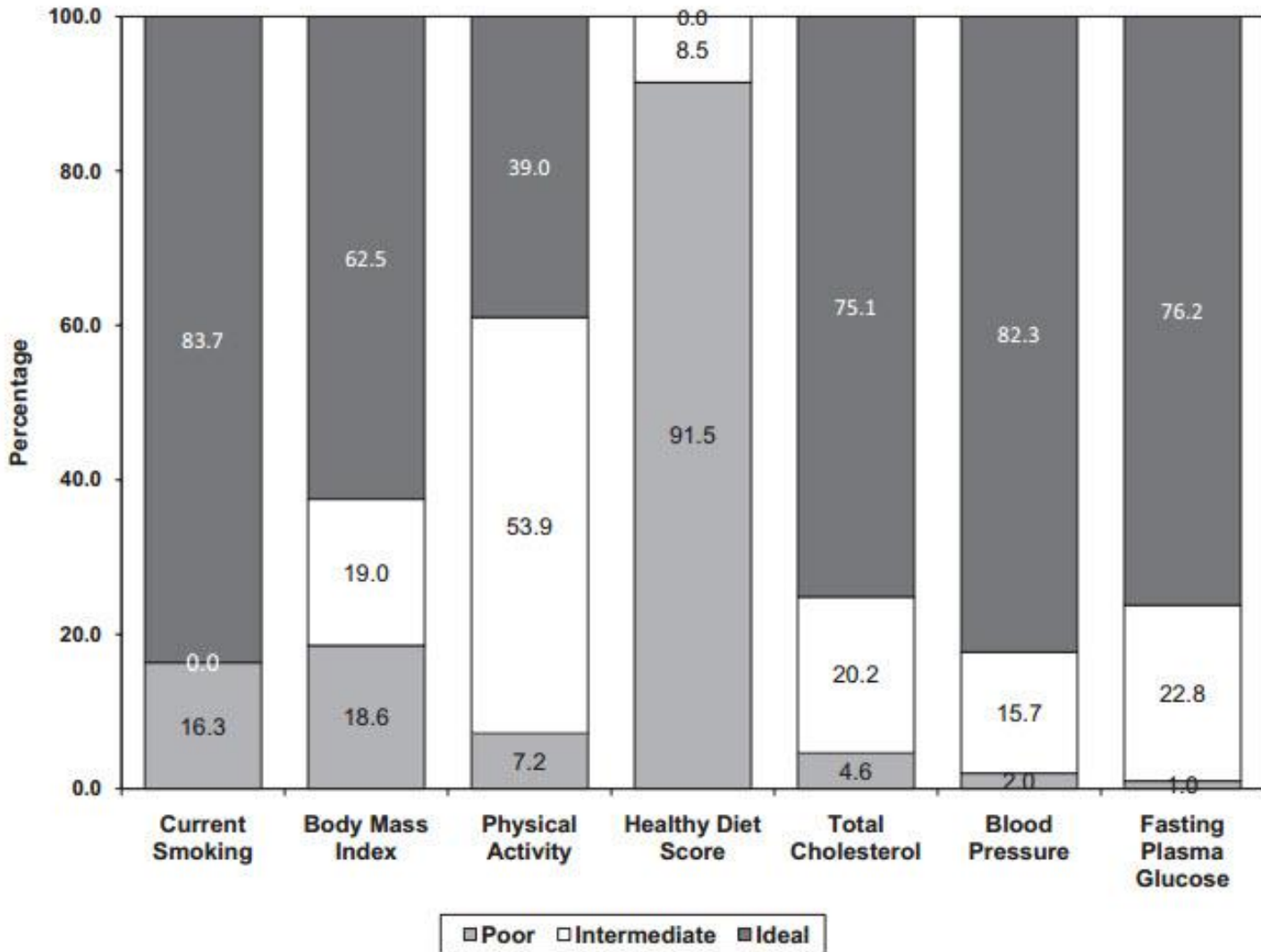
Новообразования

Болезни органов дыхания

Диабет

¹ Источник: GLOBAL HEALTH RISKS report by World Health Organization, 2009 <http://www.who.int/whosis/whostat/2010>

Young People Risk Factors (12-19 years old)



(Circulation. 2012;125:e2-e220.⁵)

(two hours without activity): **1** **Microlives Lost** (85 grams): **1**

—Mark Fischetti

SCIENTIFIC AMERICAN ONLINE
 For a video about your risk of immediate death, see ScientificAmerican.com/jan2013/graphic-science

Average Rate of Aging



Net Healthy Habits Slowed rate of aging



Net Unhealthy Habits Accelerated rate of aging



NOTE: Data are based on lifelong habits for men, ages 35 and up, averaged over large populations. Data for women are similar. No loss or gain can be attributed to a single event, such as one cigarette or one exercise session.

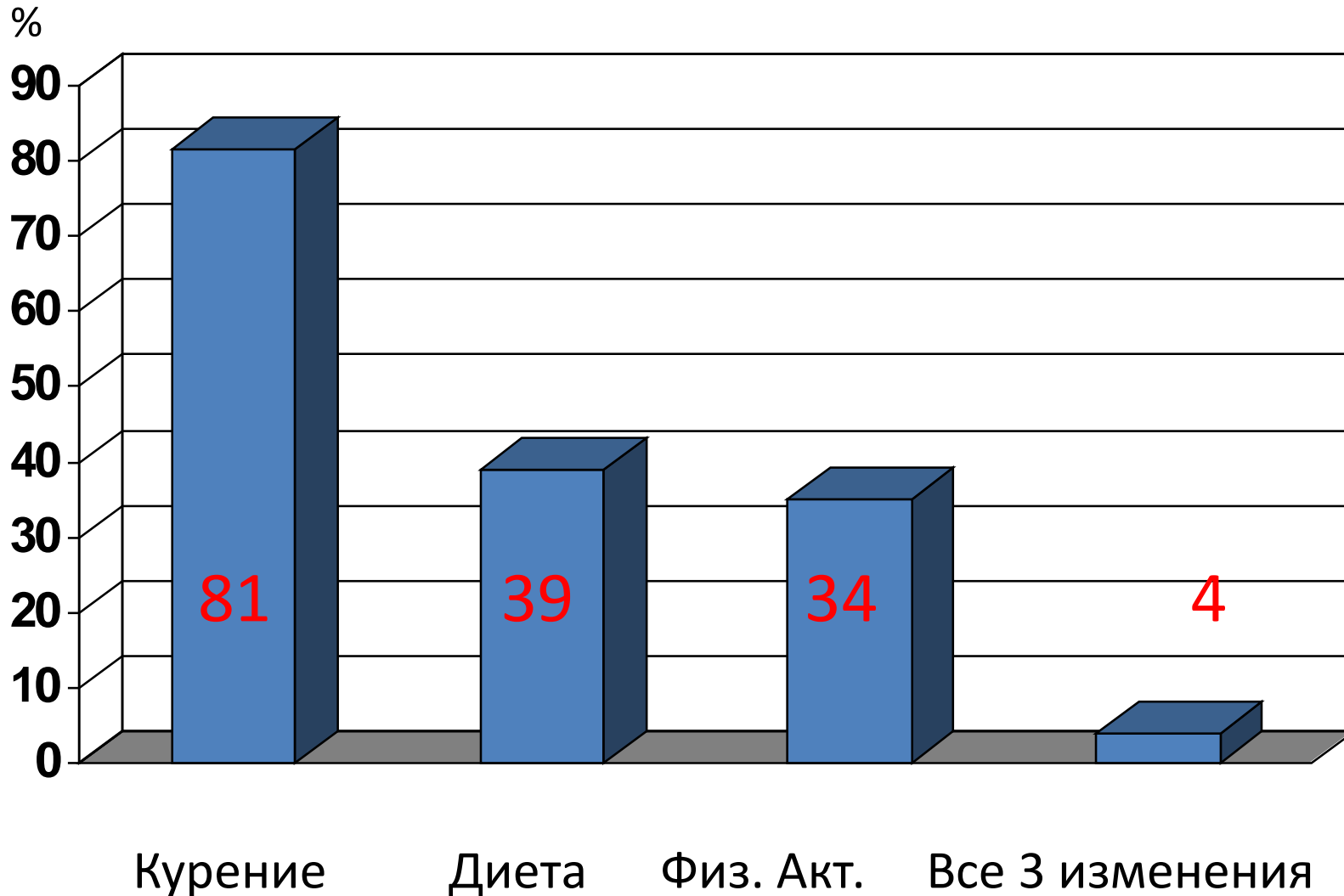
SOURCE: DAVID SPIEGELHALTER, Statistical Laboratory, University of Cambridge

6538C-40 TMS Scientific American, Inc.

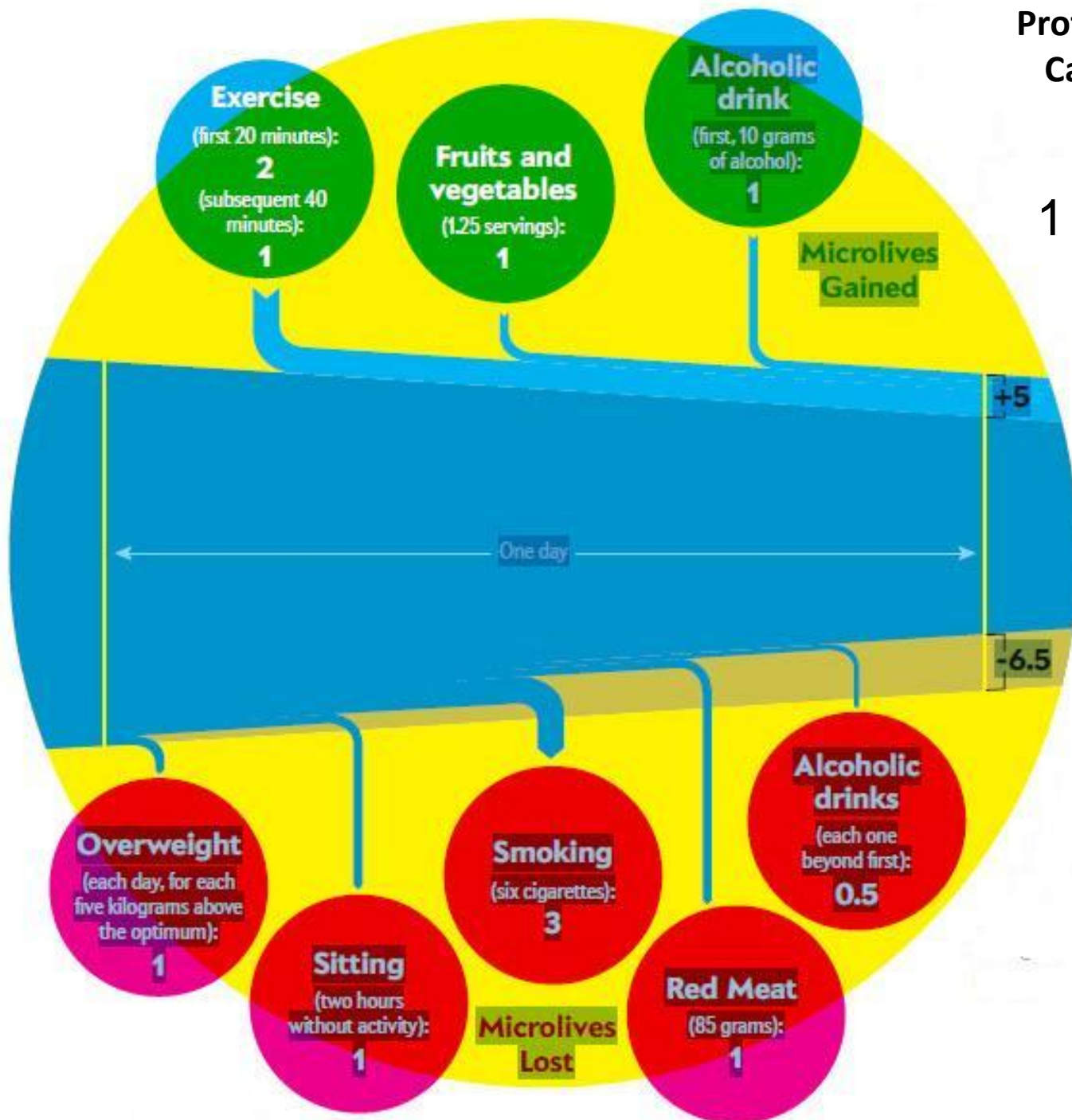
8.12 x 10.75 in



Изменение поведения у 7519 пациентов после инфаркта или инсульта –PURE project



1 Microlife = 30 min



Means of Transportation: 1960 to 2009

(Workers 16 years and over. For information on confidentiality

Средств транспорта по работ...



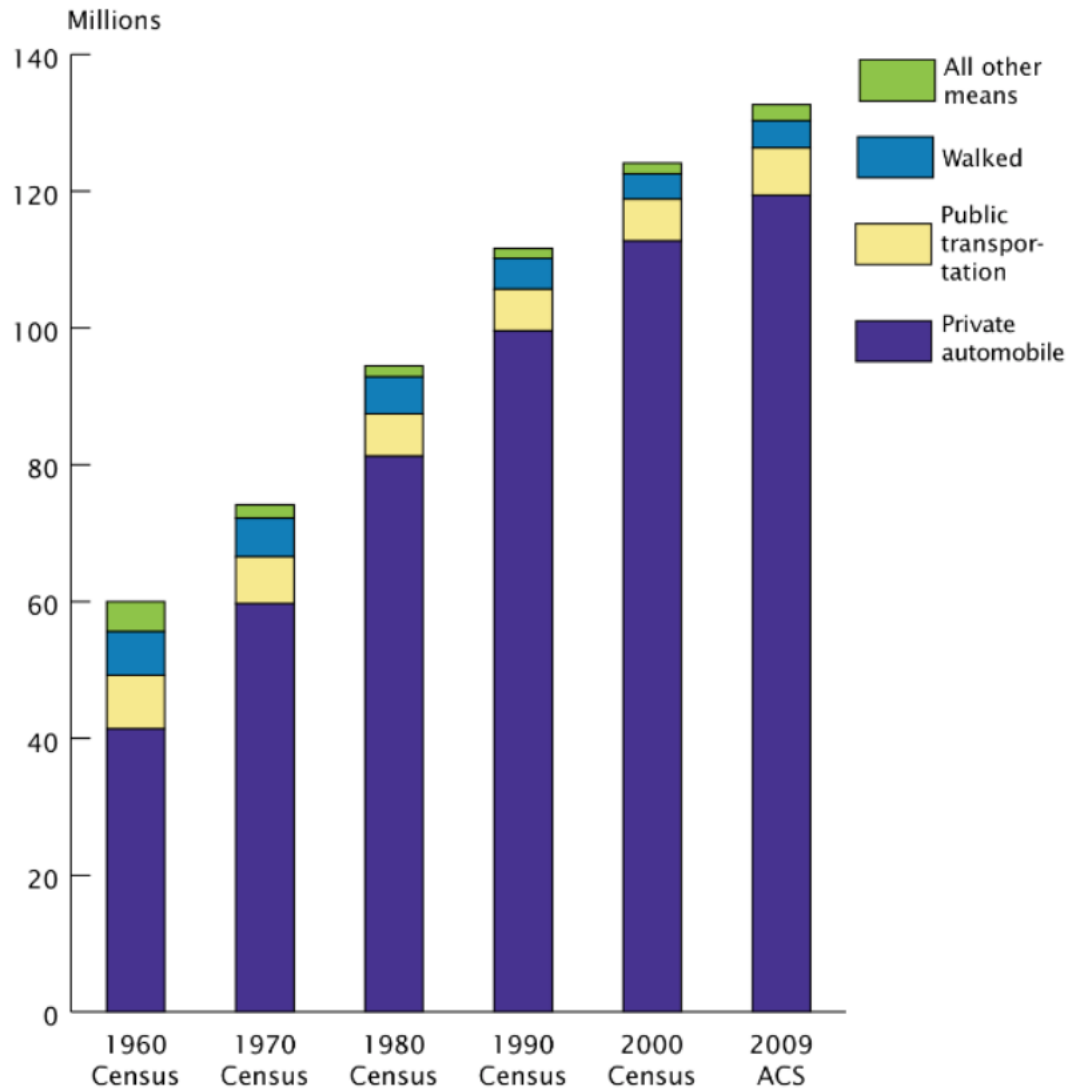
Sources: U.S. Census Bureau, Decennial Census, 1960, 1970, 1980, 1990, 2000;
U.S. Census Bureau, American Community Survey, 2009.

J Gerontol A Biol Sci Med Sci. 2013
November;68(11):1426–1432

Figure 2.

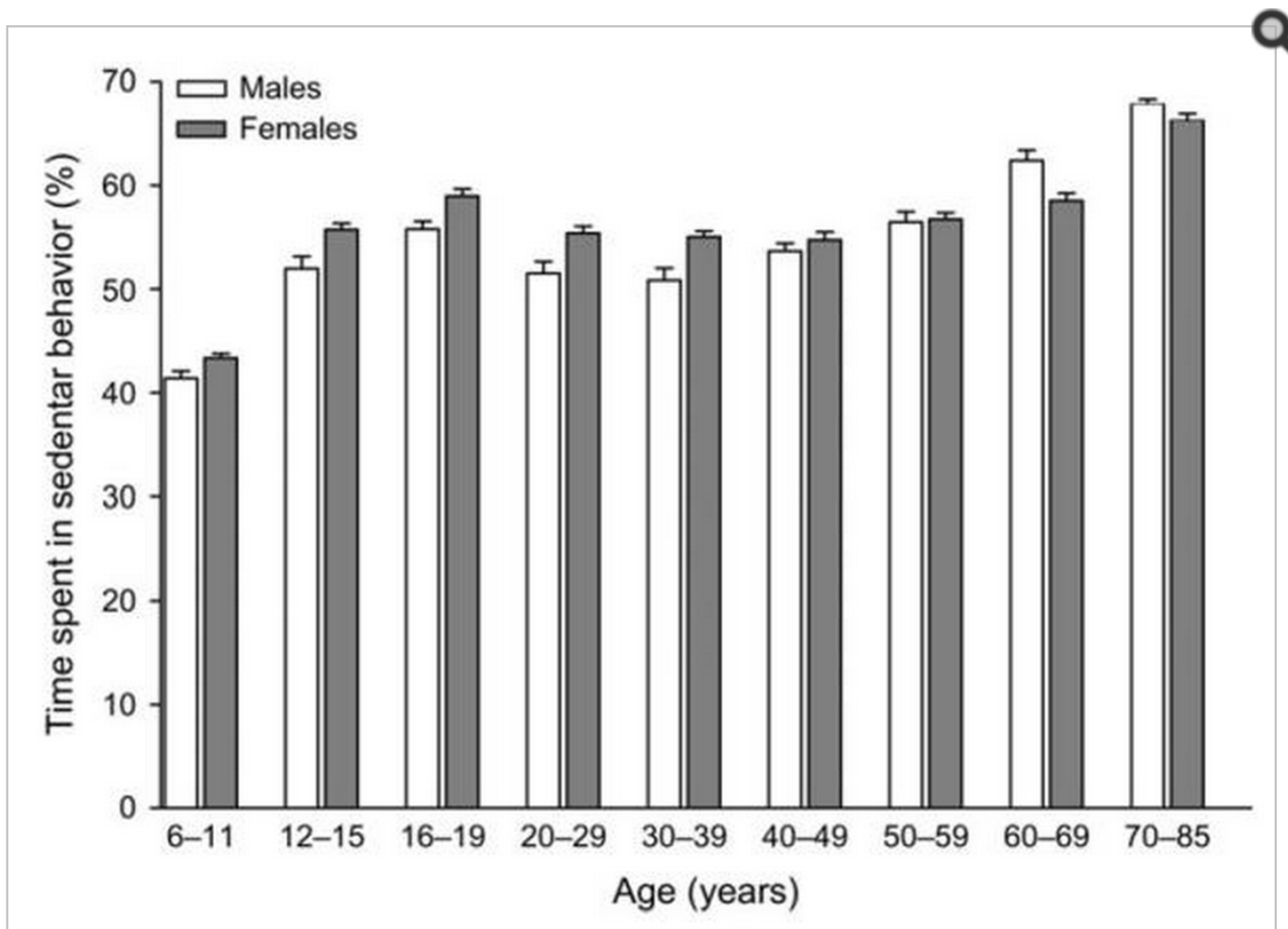
Means of Transportation: 1960 to 2009

(Workers 16 years and over. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see www.census.gov/acs/www/)



Sources: U.S. Census Bureau, Decennial Census, 1960, 1970, 1980, 1990, 2000; U.S. Census Bureau, American Community Survey, 2009.

FIGURE 1



Percentage of time spent in sedentary behaviors, by age and gender, United States, 2003–2004.

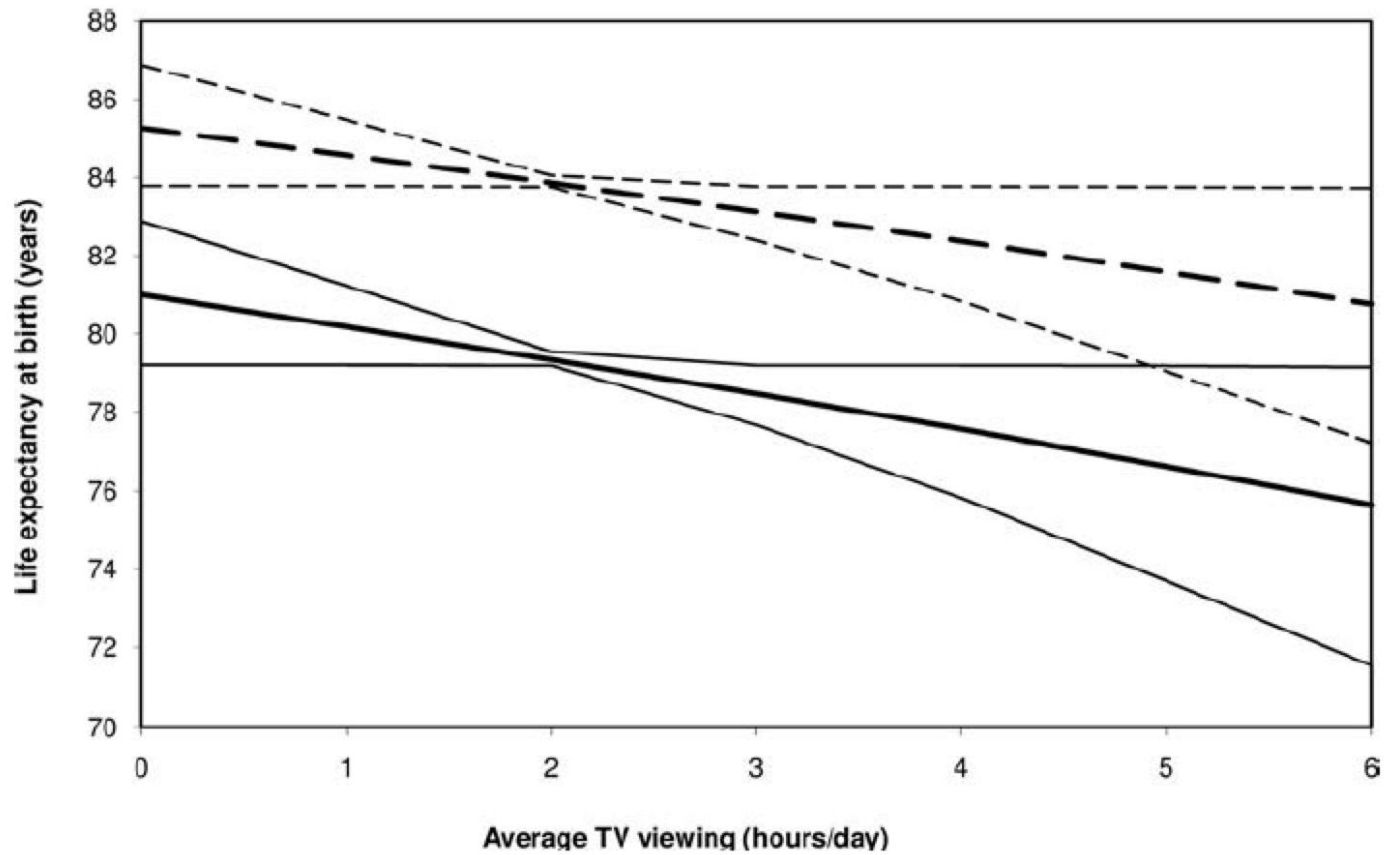
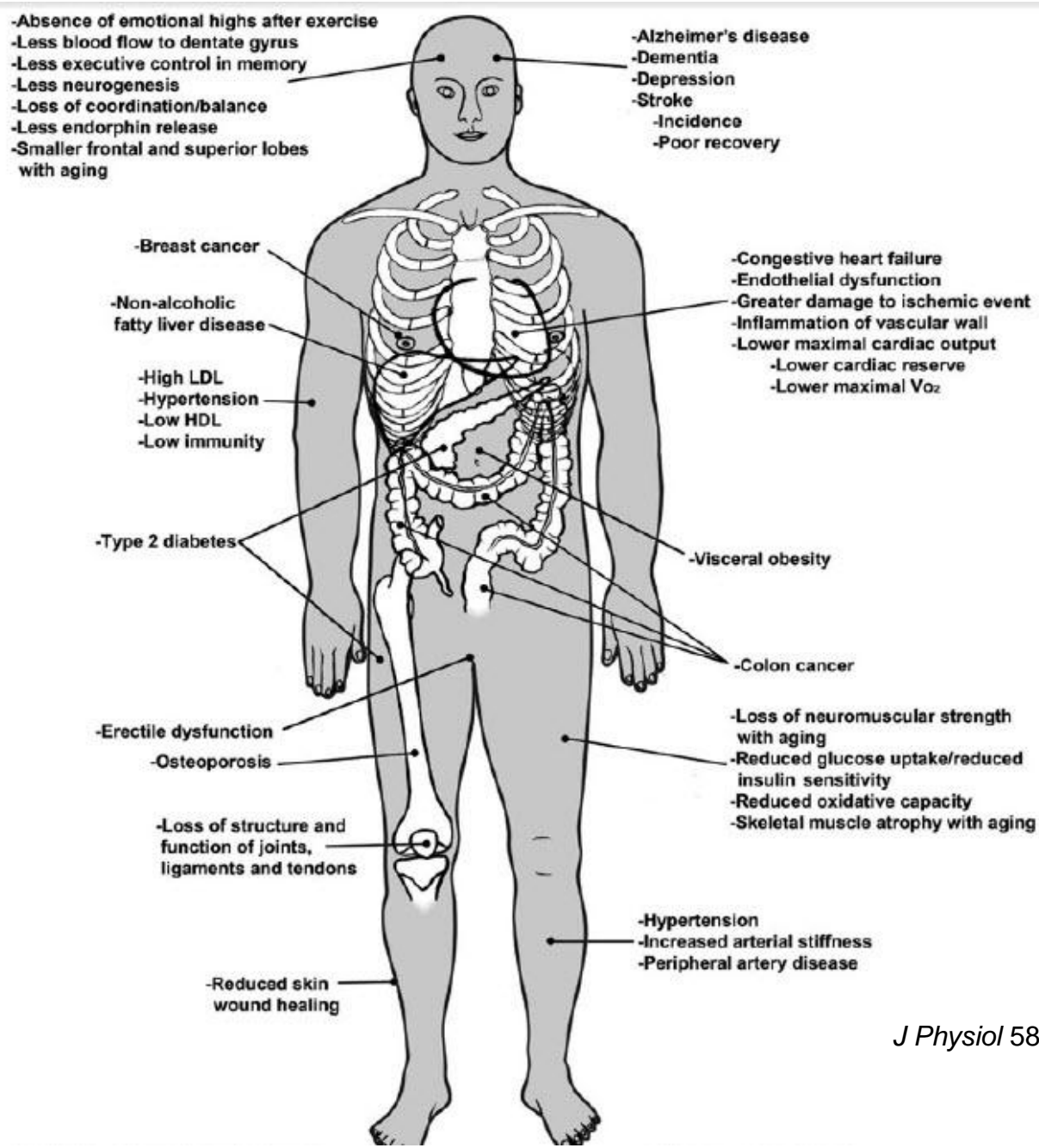


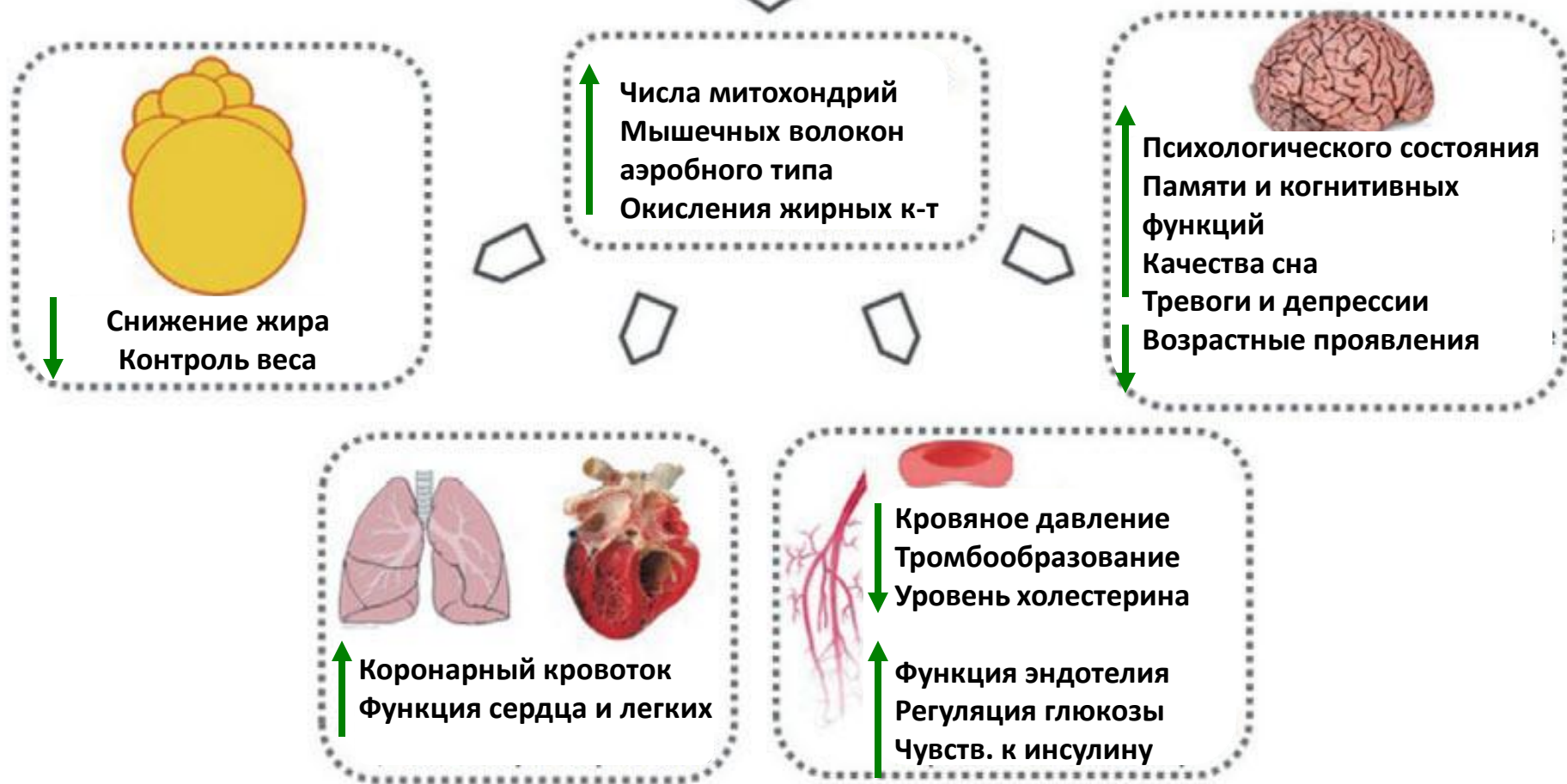
Figure 2 Life expectancy at birth by average daily amount of TV viewing time. Men in continuous lines and women in dashed lines; means (bold) and 95% uncertainty intervals.

Changes induced upon decreasing physical activity from high to low levels



J Physiol 587.23 (2009) pp 5527–5540

Физические упражнения



Running Prevents Early Aging in Mice

The mitochondria are the powerhouses of cells; they convert food into biological fuel. The mitochondria have their own genomes, which are highly susceptible to mutations; experiments on animals have demonstrated that mitochondria DNA mutations can cause early aging and death. Concurrent studies on humans have shown that endurance training can improve health and prolong life. Now, for the first time, a group of Canadian and American scientists has linked the two lines of research in an experiment with mice

suffering mitochondria DNA mutations.

The mice with the mutation get sick, age prematurely and die earlier than normal mice, so to test the effects of exercise, the scientists had some of the mutant mice run for 45 minutes three times a week from three months of age onward. When the mice reached eight months of age, they were far healthier than their sedentary counterparts, and none died early. Endurance training could possibly prolong the lives of children suffering from rare mitochondria diseases, which cause early aging.



This mouse ran its way to a longer life.

This prematurely aged mouse has not been running.

LEFT: NASA; RIGHT: SAFOUR & TWINPOLY/ISTOCKMASTER UNIVERSITY CO.



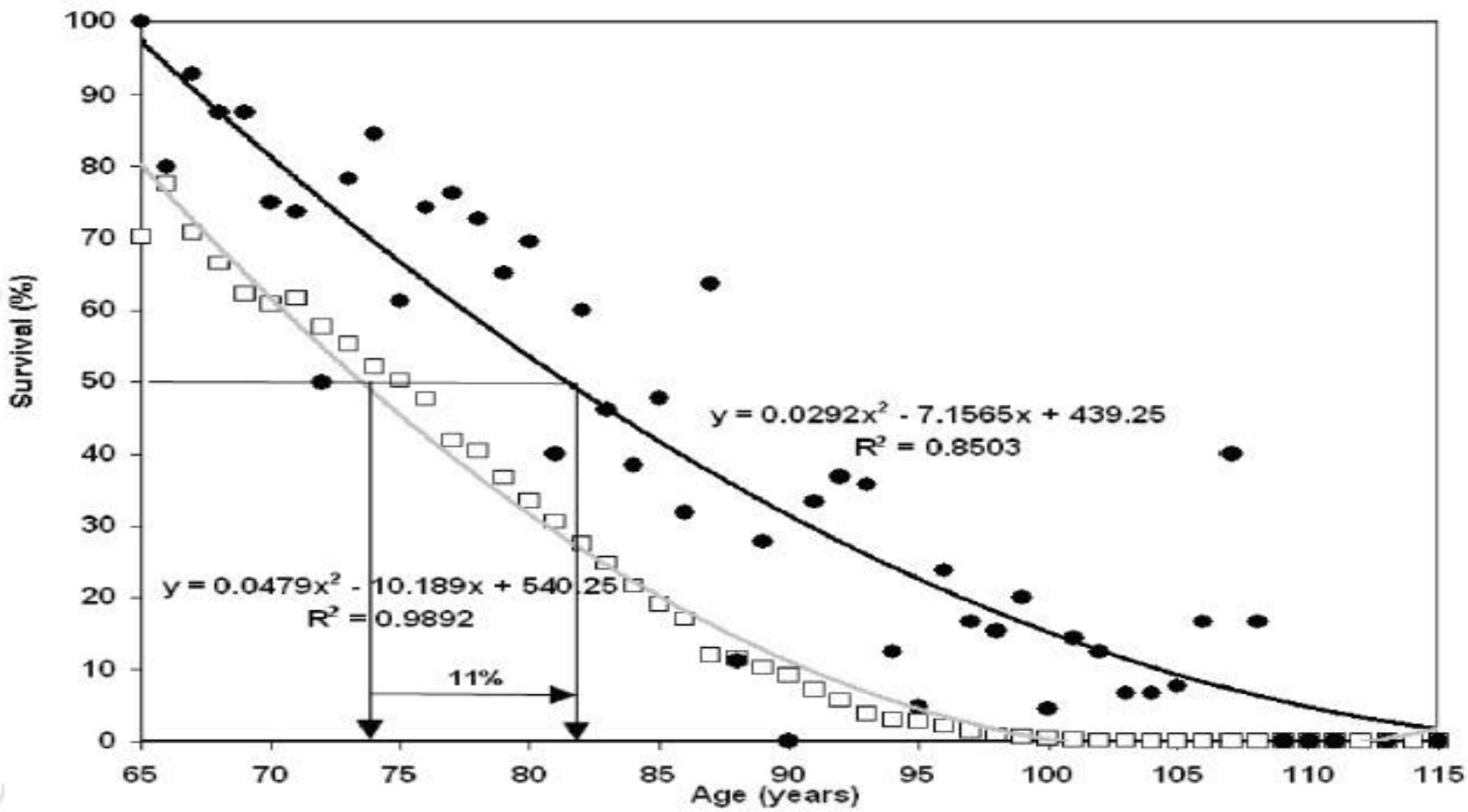
British Journal of
Pharmacology

REVIEW

Exercise acts as a drug; the pharmacological benefits of exercise

J Vina, F Sanchis-Gomar, V Martinez-Bello and MC Gomez-Cabrera

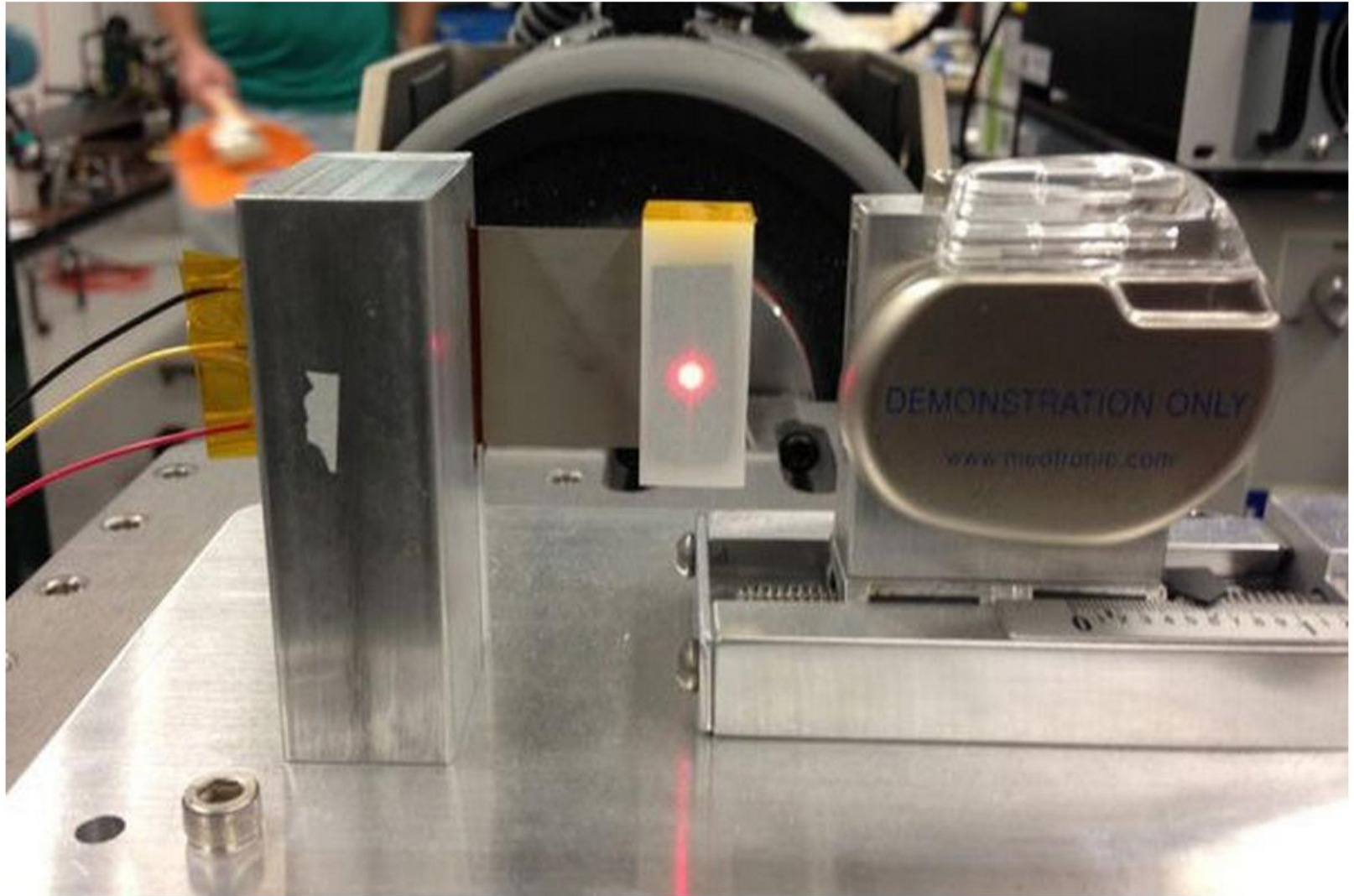
Department of Physiology, University of Valencia, Fundacion Investigacion Hospital Clinico Universitario/INCLIVA, Valencia, Spain



TDF- participants of Tour de France

Review. Exercise acts as a drug. Pharmacological benefits of exercise. British Journal of Pharmacology © 2012

Heart-Powered Pacemakers



Research

Comparative effectiveness of exercise and drug interventions on mortality outcomes: metaepidemiological study

BMJ 2013; 347 doi: <http://dx.doi.org/10.1136/bmj.f5577> (Published 1 October 2013)

Cite this as: BMJ 2013;347:f5577

Huseyin Naci, researcher¹, fellow²,
John P A Ioannidis, director³

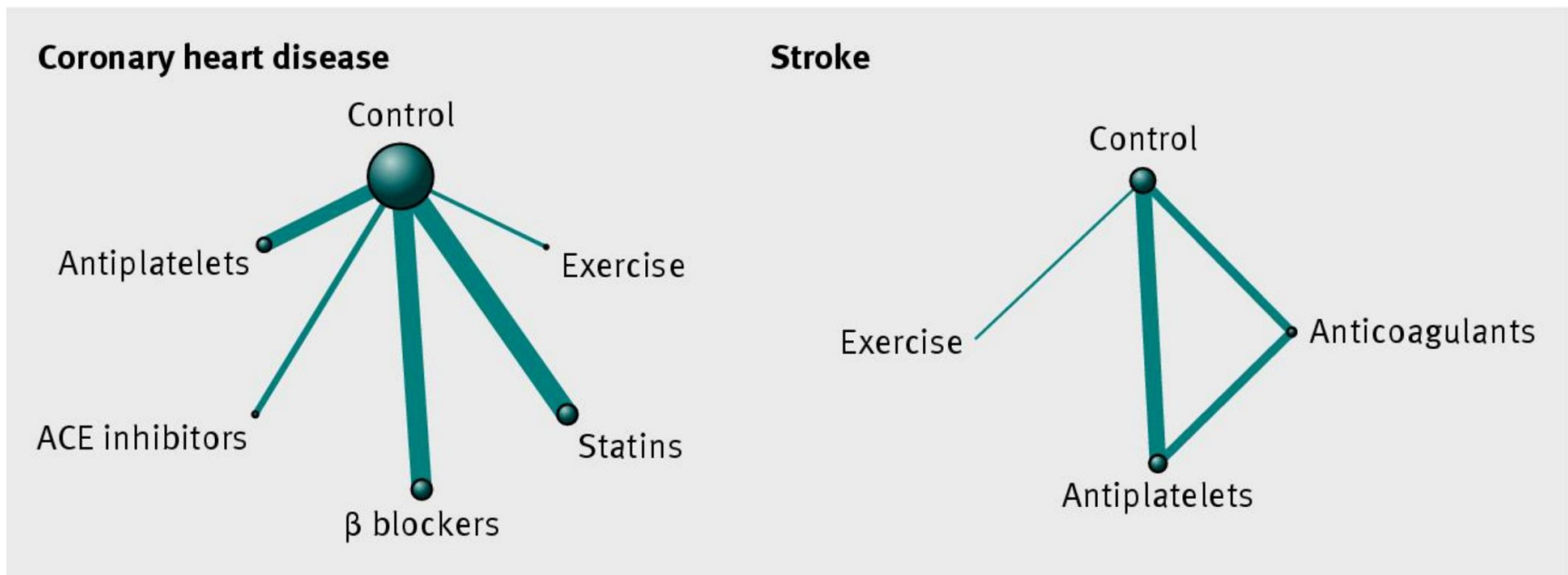
Author Affiliations

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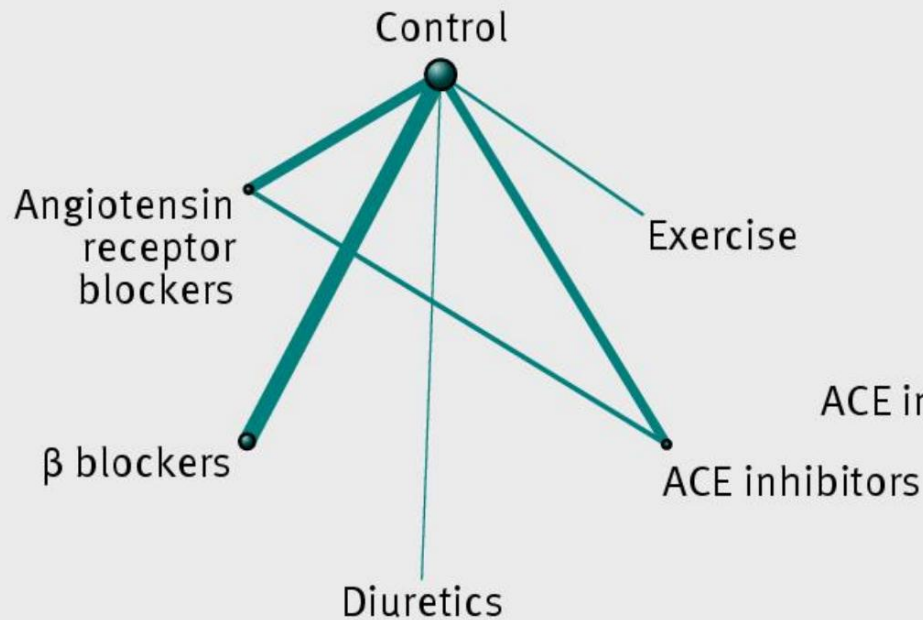
3Stanford Prevention Research Center, Stanford University School of Medicine, Stanford, CA, USA

Network of available comparisons between exercise and individual drug interventions in coronary heart disease, stroke

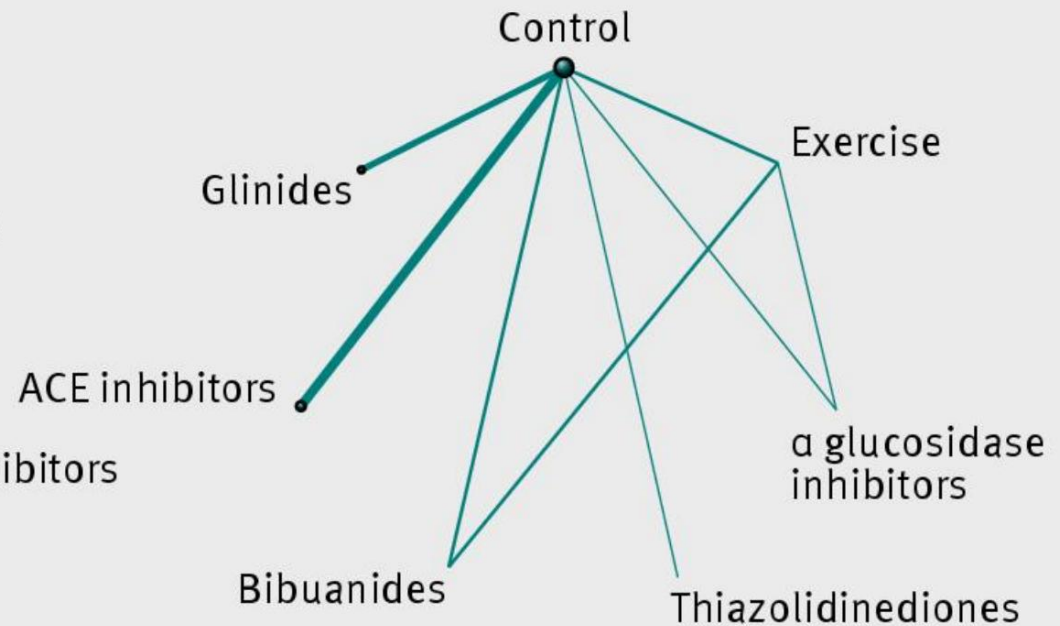


Network of available comparisons between exercise and individual drug interventions in heart failure and prediabetes

Heart failure



Prediabetes



PC
MAGAZINE



**TRACKER
NATION**

**Better Living
Through Tech**

**YOUR
FAVORITE
LAPTOPS**

**COOL 3D
PRINTER
PROJECTS**

Monitors of Physical Activity

PC Mag, 2013, April 13

Amiigo- monitor



PERSONALIZED

MEASURE WHAT MATTERS
TO YOU

INTELLIGENT

TOGETHER, THE TWO PIECE SYSTEM
TRACKS ACTIVITY TYPE, HEART RATE,
REPETITIONS & MUCH MORE



Интеллектуальный монитор физической активности фирмы Техноджим

совместно с инвентарем Technogym

- Вы можете в меню **Ваши тренировки** создать новую тренировку, основанную на использовании доступного для вас спортивного инвентаря Technogym
- С вашего ПК вы можете получить доступ к результатам тренировок, созданных и заданных вашим клубом и выполненных в клубе
- Вы можете вручную вводить в **Календарь** информацию о тренировках, выполненных на тренажерах Technogym, но не зафиксированных вашим mywellness key
- Если вы продвинутый пользователь mywellness key, вы можете получить доступ к меню **Расширенные функции** и установить персонализированные цели на вашем mywellness key





ДВИЖЕНИЕ

ТРЕНИРОВКА

ИЗМЕРЕНИЯ ПОКАЗАТЕЛЕЙ

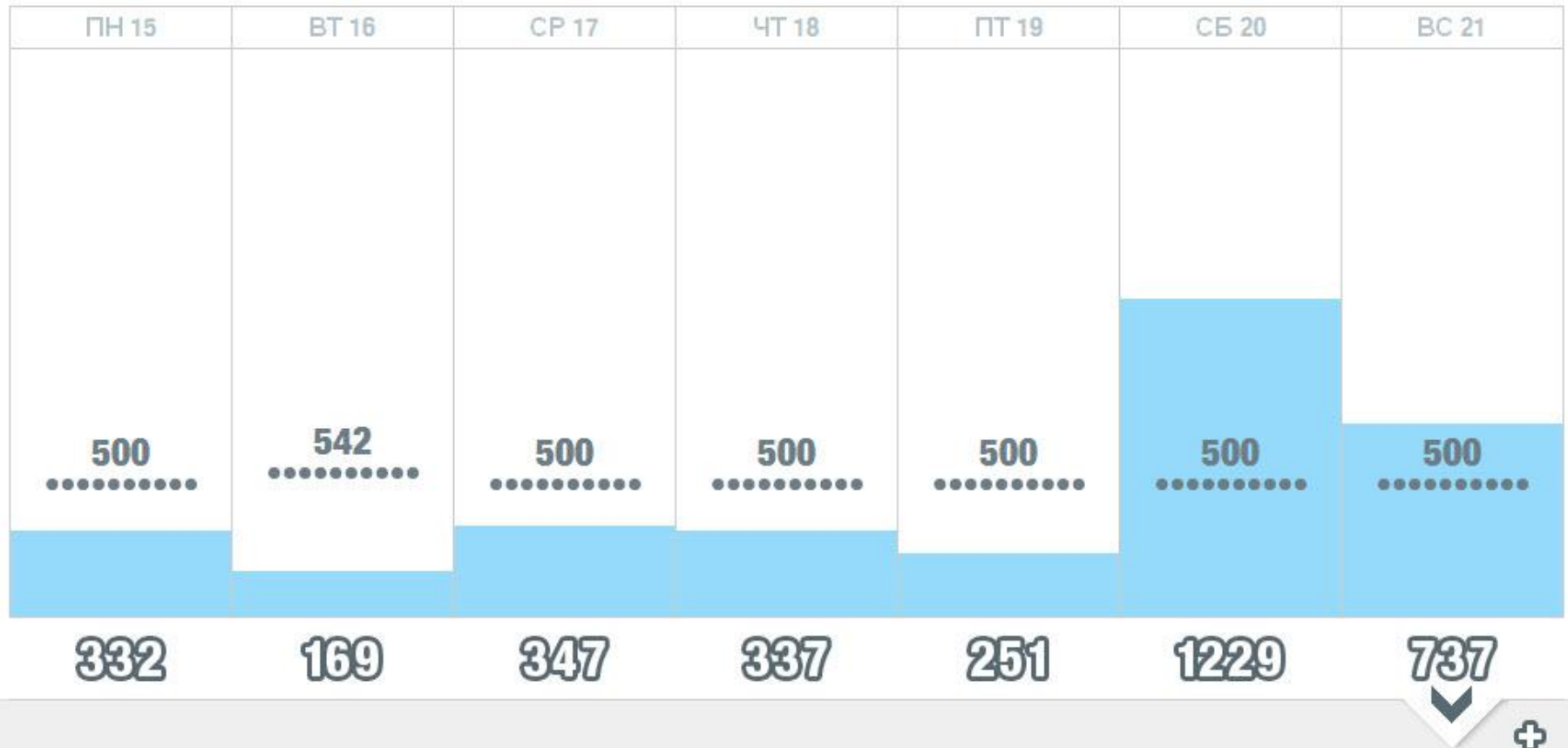
ТУРНИР



15-21 АПРЕЛЬ 2013

АПРЕЛЬ

2013





сот. телефон

манжетка

майка

голов. повязка

прищепка

часы, браслет

брелок

датчик в обуви

INSTRUMENTED

Automatic real-time monitoring of pressure, calories burned, motion, or temperature.

INTERCONNECTED

Connects personal health record services, PCs, smart phones, and secure information with caregivers and doctors.

INTELLIGENT

Analyzes data, tracks progress, and provides recommendations.

HOWEVER,

More than

10%

consumers do not know if their device have these capabilities.



Designed
to look good



Basis mybasis.com акселерометр, датчик пульса и влагосодержания кожного покрова 199\$



Mio Alpha Watch
alphaheartrate.com
Датчик пульса, Bluetooth
199\$

Часы Адидас

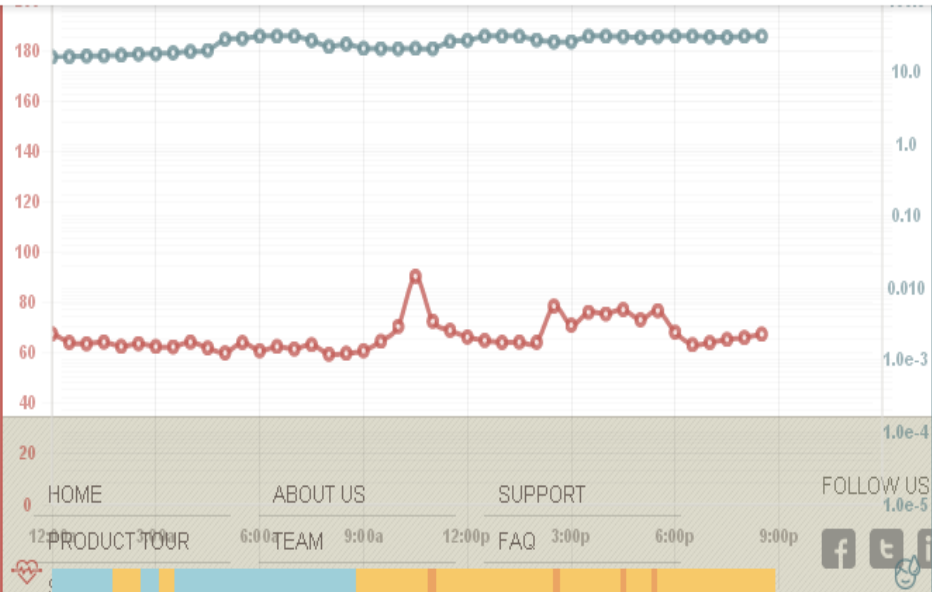


Heart Rate & Perspiration

TUE 15 OCT
12:00 a – 11:59 p



- ▼ HEART RATE
- STEPS
- CALORIES
- SKIN TEMP.
- PERSPIRATION



- HEART RATE
- STEPS
- CALORIES
- SKIN TEMP.
- ▼ PERSPIRATION
 - μS / cm
 - High: 31.5
 - Avg: 25.7
 - Low: 15.9
 - Total: 3.2e+4

Отечественные разработки браслетов для мониторинга физиологических показателей человека



- МТ:** Изготовлен из высококачественного пластика, ремешок - из силикона, чтобы не допустить раздражения кожи от длительного ношения браслета.
- МТ:** Сделан из ударопрочных и водонепроницаемых материалов.
- МТ:** Общая длина браслета - 17,9 см. Габариты устройства: толщина - 1,9 см, ширина - 4,8 см, длина - 4,3 см.
- МТ:** Браслет абсолютно безопасен для постоянного ношения.



- GSM-телефон/спикерфон
- Датчик движения/падения
- Датчик температуры тела
- Датчик пульса
- Тревожная кнопка
- Определение местоположения по GSM
- Центральная ИТ-система постоянно получает, обрабатывает и анализирует данные



Устройство НЕ является медицинским и не требует специальной сертификации



THE ESSENCE OF BRITAIN

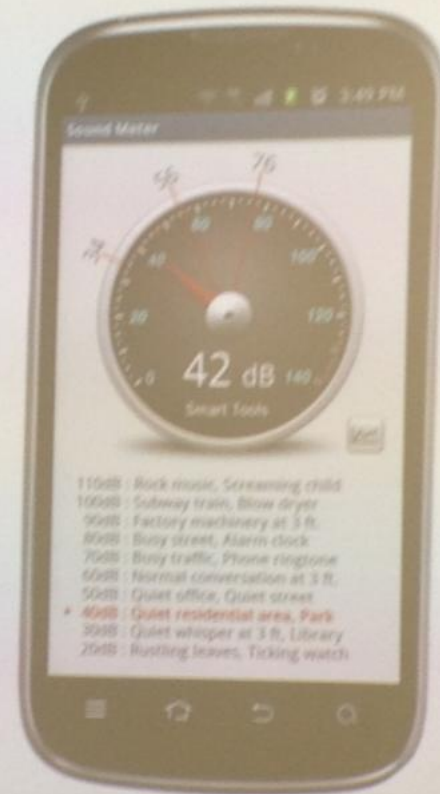
Made in Switzerland by BREITLING



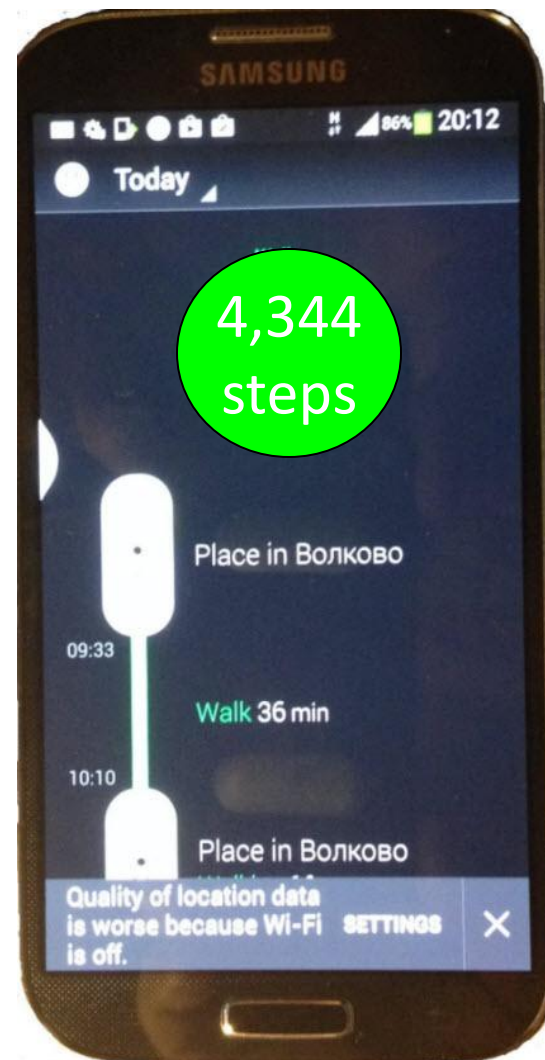
BREITLING
— *for* —
BENTLEY

Smartphone as a scientific tool

- Camera
- Audio recorder
- Light meter
- Sound meter
- Compass
- Location sensor (GPS)
- Temperature
- Magnetic field
- Accelerometer
- Barometer
- Humidity Sensor
- Wind speed
- Heart rate



Бесплатная программа Moves для оценки уровня двигательной активности на смартфоне iPhone и на базе Android OS



Using Pedometers to Increase Physical Activity and Improve Health

A Systematic Review

Dena M. Bravata, MD, MS

Crystal Smith-Spangler, MD

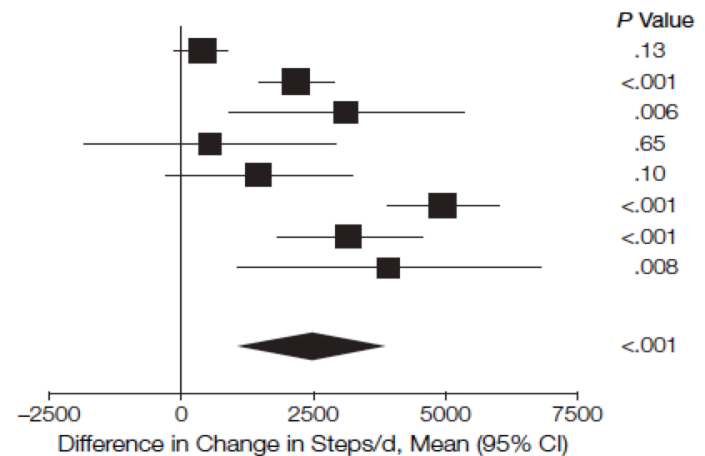
Vandana Sundaram, MPH

Allison L. Gienger, BA

Context Without detailed evidence of their effectiveness, pedometers have recently become popular as a tool for motivating physical activity.

Objective To evaluate the association of pedometer use with physical activity and health outcomes among outpatient adults.

Source	Sample Size		Difference in Change in Steps/d, Mean (95% CI)	P Value
	Intervention	Control		
Butler and Dwyer, ¹⁷ 2004	17	16	395 (-118 to 908)	.13
Hultquist et al, ¹⁹ 2005	31	27	2226 (1488 to 2964)	<.001
Araza et al, ¹⁶ 2006	15	15	3189 (905 to 5473)	.006
de Blok et al, ¹⁸ 2006	8	8	567 (-1872 to 3006)	.65
Talbot et al, ²³ 2003	17	17	1498 (-300 to 3296)	.10
Moreau et al, ²⁰ 2001	15	9	5066 (4003 to 6129)	<.001
Izawa et al, ¹⁴ 2005	24	21	3254 (1851 to 4657)	<.001
Ransdell et al, ²¹ 2004 and Ormes et al, ²² 2005	28	9	3994 (1050 to 6938)	.008
Summary difference	155	122	2491 (1098 to 3885)	<.001



Presents the difference in the change in steps per day before and after the intervention between the participants in the experimental and control arms of the randomized controlled trials. The size of the data markers are proportional to the sample size, which represents the number of individuals who completed the trials.

Table 2. Baseline Participant Characteristics^a

Characteristic	No. of Studies Reporting This Characteristic (No. of Participants)	Preintervention, Mean (SD)	Change Postintervention	
			Mean Change (95% Confidence Interval) ^b	P Value
BMI	18 (562)	30 (3.4)	-0.38 (-0.05 to -0.72)	.03
Blood pressure, mm Hg				
Systolic	12 (468)	129 (7.5)	-3.8 (-1.7 to -5.9)	<.001
Diastolic	12 (468)	79 (4.5)	-0.3 (0.02 to -0.46)	.001
Cholesterol, mmol/L				

Table 3. Use of a Step Goal

Alternatives	Sources ^a	Mean Change in Physical Activity From Baseline, Steps/d (95% Confidence Interval)	P Value
No step goal	14, 21, 22, 36	686 (-1621 to 2994)	.60
10 000 step/d goal	16, 19, 28-30, 33, 34, 37	2998 (1646 to 4350)	<.001
Other step goal ^b	13, 15, 17, 18, 20-24, 26, 27, 30-32, 35, 38, 39	2363 (1789 to 2936)	<.001

^aStudies are included in more than 1 category because they compared 2 or more study groups that had different goals.

^bTypically, these were based on incremental increases in daily steps over baseline.



Public Health Responsibility Deal

Sign up and pledge to improve public health in England



[Home](#) [About](#) [Our partners](#) [Pledges](#) [Case studies](#) [Sign up](#) [Partner login/dashboard](#) [Local partners](#)

[Public Health Responsibility Deal](#) > [Physical Activity Network](#) > Public Health Responsibility Deal: Physical activity Pledges

Public Health Responsibility Deal: Physical activity Pledges

December 20, 2011

Sign up or log in



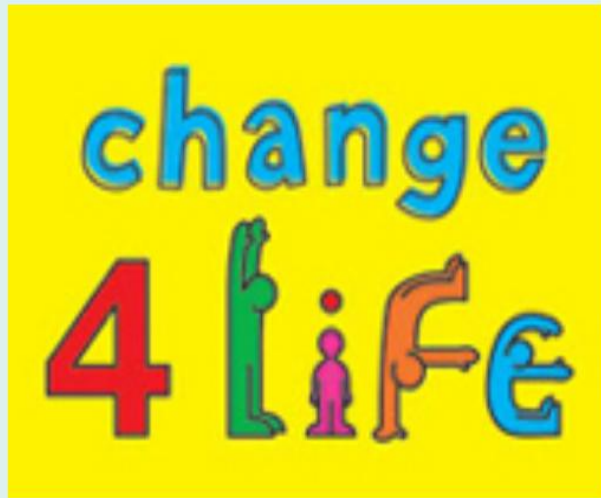
Search this site

Connect with DH

[Read our blogs](#)

<https://responsibilitydeal.dh.gov.uk/physical-activity-pledges/>

Change4Life



Find out how you can use the Change4Life brand

Collective pledges

- ▶ All collective pledges
- ▶ PHRD alcohol pledges
- ▶ PHRD food pledges
- ▶ PHRD health at work pledges
- ▶ PHRD physical activity pledges



A 12-page layout in the September issue of Vogue features models wearing Glass, sleek hair and minimalist designs. VOGUE



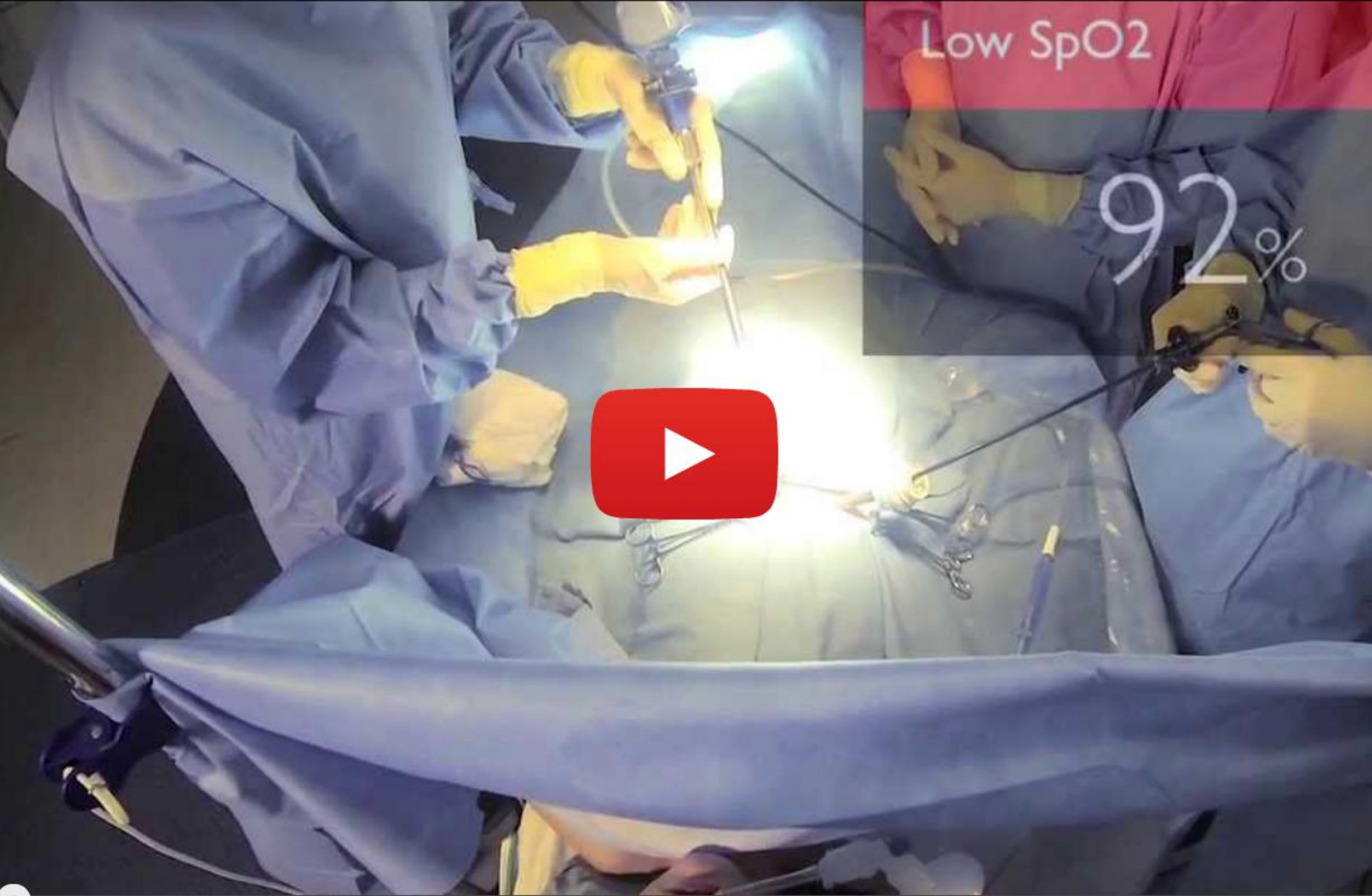
Both attired in Google Glass, Diane von Furstenberg watches her models rehearse during New York Fashion Week last September with Sergey Brin, a Google founder. CARLO ALLEGRI/REUTERS

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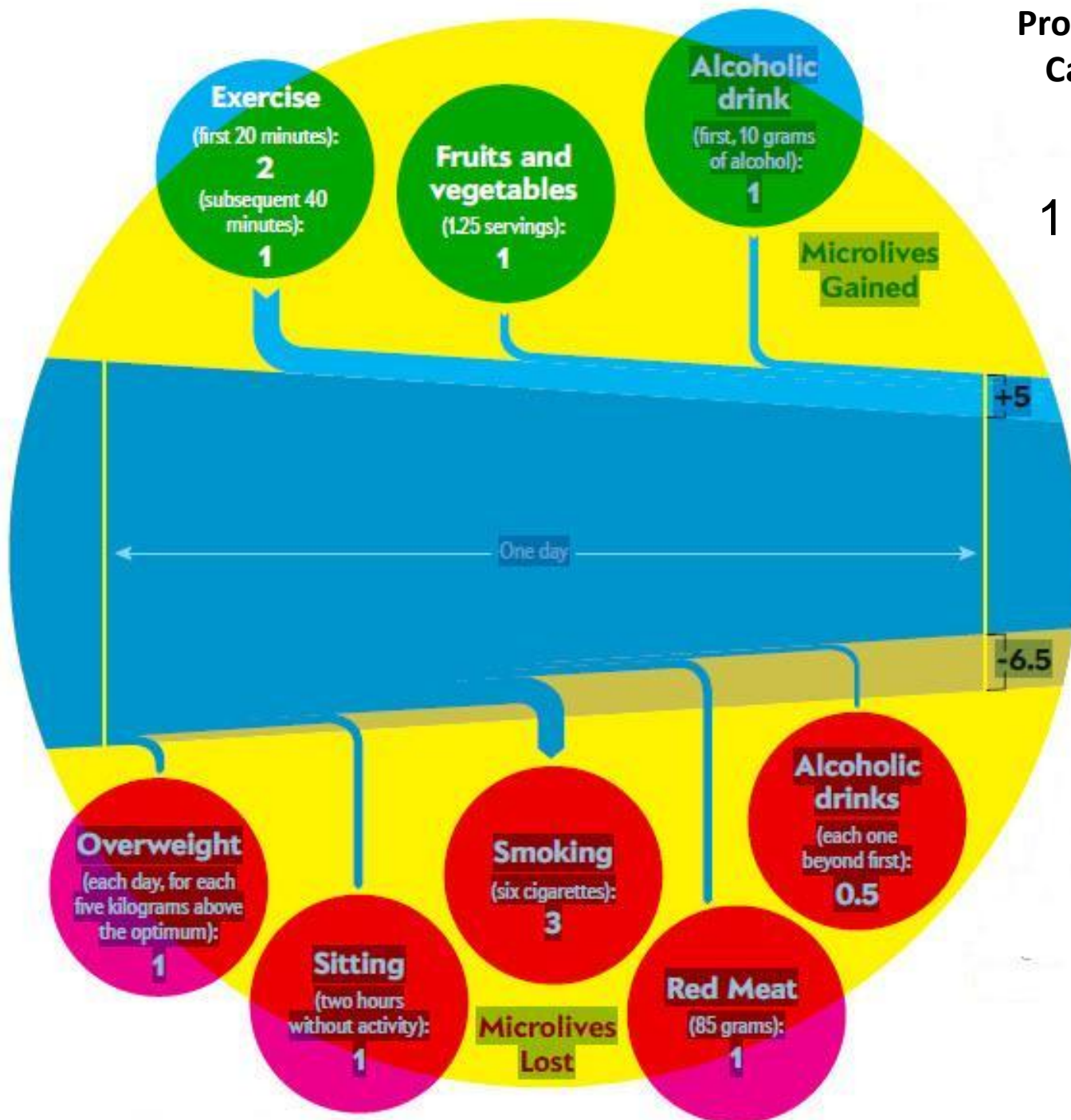
Week
go



From left: Jean Wang, a hardware engineer; Isabelle Olsson, lead industrial designer; and Kelly Liang, director of business development, are among the powerful women behind Glass. ANNIE TRITT FOR THE NEW YORK TIMES



1 Microlife = 30 min



- [Best of 2012:](#)
- [Best of 2011:](#)
- [Best of 2010:](#)
- [Best of 2009:](#)
- [Best of 2008:](#)
- [Best of 2007:](#)
- [Exclusive Interviews](#)
- [Biscotti Issues](#)
- [Link Lattes](#)

- [Dangerous Roads of the World, 1-6](#)
- [Steampunk Series](#)
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- [Cars & Girls!](#)
- [Strangest Tanks 1, 2](#)
- [Architectural Horrors](#)
- [Funny Animals](#)
- [Best of Japan!](#)
- [Best of Russia!](#)
- [Mystery Devices 1-2](#)
- [Oops! Accidents...](#)
- [Weird Signs](#)
- [Robots in Arts!](#)
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- [Strangest Vehicles 1-4](#)
- [Inventions by Guys](#)
- [Crazy Wiring!](#)
- [Cool Technology](#)
- [Never Give Up! Crazy Logistics](#)
- [Vintage Stewardess](#)
- [Photos 1-4](#)
- [Ugly Faces!](#)

This is only a sample
See more in "Categories"

Spotlight



The Ultimate Guide to

You are a bigoted, chauvinist pig!.. oh wait, this ad is from 1950

Disclaimer: Please note that the views and opinions expressed in these vintage advertisements do not represent those of Dark Roasted Blend, our editors and writers. We have nothing to do with it. We can only stare at it in utter stupefaction.

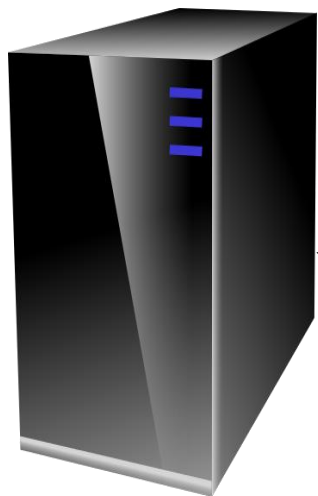


The ad above is "tasteless", indeed... Maybe people were coming out of depression and they needed to look healthier.

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- [Computers](#)
- [Cool Ads](#)
- [Extreme Weather](#)
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- [Gadgets](#)
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- [Humour](#)
- [Link Latte](#)
- [Military](#)
- [Music](#)
- [Nature](#)
- [Oops! Accidents](#)
- [Photography](#)
- [Robots](#)
- [Science](#)
- [Science Fiction](#)
- [Signs](#)
- [Space](#)
- [Sports](#)
- [Technology](#)
- [Trains](#)
- [Travel](#)
- [U.E. / Abandoned](#)
- [Vintage](#)
- [Weird](#)

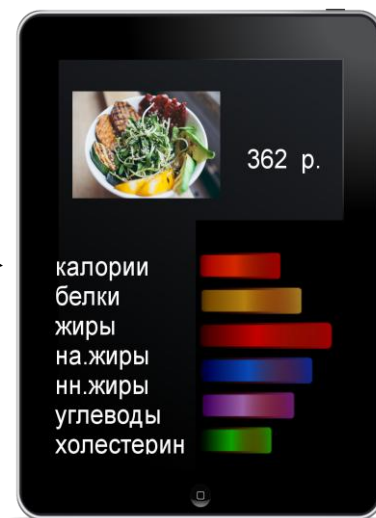
Don't go bobbing for App...
Get the right memory for Mac...
Crucial® Memory

M-Health приложение для выбора здоровой еды (QR-code project)



Сервер:

- информация о:
 - меню
 - составе и характеристиках продуктов
 - стоимости
- управление заказами
- предоставление информации о составе блюд



Пользователь, мобильное устройство.

- информация о составе блюд
- контроль потребления калорий и отдельных компонентов (напр. насыщенных и ненасыщенных жирных кислот, трансизомеров)
- формирование заказа
- ведение дневника калорий и физич. активности



Делайт



Ингредиенты:

- Брокколи (на пару)
- Тыква стейки(на гриле)
- Шпинат(на гриле)
- Помидоры черри
- Соус: масло оливковое
- Соевый тамари

Энергетическая ценность на порцию:

Белки	12
Жиры	29
Жиры насыщенные	2
Жиры ненасыщенные	20
Углеводы	13
Сахара (из углеводов)	0
Клетчатка (из углеводов)	0
Калорийность	146

Track your drinking from your mobile phone



If you have an iPhone or iPod touch you can download the free **NHS Drinks Tracker** from the iTunes App Store.

The NHS Drinks Tracker makes it easy to:

- Calculate the units in your drinks.
- Track your drinking over weeks and months.
- Get personalised feedback on your drinking.
- Find local NHS alcohol services.

[Download it now!](#)

If you want more information on how to use the iPhone app go to www.nhs.uk/livewell...



You can also use the mobile NHS Units Calculator from any phone that has access to the internet. This calculates how many units of alcohol your drink contains. Simply text Units to NHSGO (64746).

Box 4: Drinks Tracker iPhone App⁴⁵

The UK NHS's Drinks Tracker iPhone app, launched in 2009 before Christmas (traditionally a time of year when many people drink more heavily than usual), enables users to calculate the number of "units" of alcohol they have consumed, to log this over a period of weeks or months, and to receive personalised feedback. A cut-down version of the app is available for use with any mobile phone with Internet connection. The app also provides contact information for local NHS support services.

Each time a user drinks alcohol, they tap one of four icons on the screen and adjust the data on alcoholic strength if required. The app

keeps track of the total consumed, and can be personalised to offer alternative views. Drinks consumed can be saved to the Tracker for each particular day, and it displays a running total for the week. Users can tap on a feedback button to receive information and advice about their consumption over the previous seven days, based on the UK government's guidelines.

The app – which cost the NHS around GBP10 000 to develop (according to news reports) – is part of a range of

