NICE guidance: behaviour change
Lifestyle does it matter?

Professor Mike Kirby FRCP

University of Hertfordshire & The University of Bedfordshire (IDOP)
Lifestyle interventions

What’s new in lifestyle approaches to CVD risk?
two thirds of British people over 15 are physically inactive, a far greater proportion than in the United States, Australia, France, Germany, or Holland. The economic cost of inactivity is estimated as £7.4bn (€9.4bn; $11.9bn) a year.
Introducing Public Health England’s “Everybody Active, Every Day” campaign.

Jane Ellison, public health minister, said, “Increasing physical activity is a priority right across government.

DOH is already supporting local authorities by investing £8.2bn over three years to target public health priorities in their areas.

Physical activity is at the heart of the campaign, and we must give people the best possible information about what works well.”
Introduction

- Practitioners use a range of interventions to improve a person’s health
- But there is a lack of advice on what techniques to use for specific behaviours, populations or risk factors
- For medium or long-term improvements in health, behaviour change must be sustained
  Change is most likely to be sustained when a combination of individual, community & population level interventions are used
- There is a reasonable evidence base regarding motivation to change

Definition of behaviour change techniques relevant for a range of health behaviours\textsuperscript{1,2} and for specific behaviours:
- To improve diet or encourage physical activity\textsuperscript{1,3-6}
- To prevent weight gain\textsuperscript{1,7}
- To stop smoking\textsuperscript{1,8}
- To reduce alcohol intake\textsuperscript{1,9}
- To prevent HIV\textsuperscript{1,10}

Figure 1: Burden of disease attributable to 20 leading risk factors

Statistics shown are for both sexes in 2010 and expressed as a percentage of UK disability-adjusted life-years. Source: Lancet 2013;318:997-1020
Reproduced with permission of the editor of the Lancet
Forever Young

More people are behaving as if they’ll never grow old
Is that such a good idea?

BY CATHERINE MAYER
Comparative effectiveness of exercise and drug interventions on mortality outcomes: meta epidemiological study

Huseyin Naci et al LSE Health, London School of Economics and Political Science, London, UK; Drug Policy Research Group, Department of Population Medicine, Harvard Medical School, Boston, MA, USA; Stanford Prevention Research Centre, Stanford University School of Medicine, CA, USA

BMJ 2013;347:f5577 doi: 10.1136/bmj.f5577 (Published 1 October 2013)
What is known?

Population level cohort studies suggest that physical activity is associated with decreased risk of mortality

What this study adds:

Evidence on the mortality benefits of drug and exercise interventions varies widely, BUT:

Based on available data on the secondary prevention of CHD, stroke, heart failure, and pre-diabetes, physical activity is potentially as effective as many drug interventions
25-year CHD mortality rates per baseline cholesterol quartile adjusted for age, cigarette smoking, and systolic blood pressure.

Using linear approximation, a 20-mg/dL increase in total cholesterol corresponded to a 17% increase in mortality risk.
Premature mortality from CVD in men aged under 65

Chart 3.9: Male premature mortality from all circulatory diseases
Aged under 65 years, England, EU-15 countries and selected averages

Standardised death rate (SDR) per 100,000 population

KEY
- Best EU-15 country
- Worst EU-15 country
- England
- EU average (all countries in the EU)
- EU-15 (member countries before 2004)
- EU-12new (member countries from 2004)

Finland 75% due to change in risk factors (smoking & diet)

All other countries - WHO, Health For All Database-Jun 2007. Web link http://www.euro.who.int/hfadb
Inactivity

- Over the last 25 years, the average number of miles per year travelled on foot has fallen by 25% & by cycle 33%
- Two thirds of adults are sedentary for 6 or more hours on weekdays
- The average adult watches 2.8 hours of TV on weekdays, increasing at weekends. This is 16 times greater than the average time currently spent in physical activity

<table>
<thead>
<tr>
<th>Disease</th>
<th>Effect of physical activity</th>
</tr>
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<tr>
<td>Coronary heart disease</td>
<td>Moving to moderate activity could reduce risk by 10%</td>
</tr>
<tr>
<td>Stroke</td>
<td>Moderately active individuals have a 20% lower risk of stroke incidence or mortality</td>
</tr>
<tr>
<td>Type 2 diabetes</td>
<td>Active individuals have a 33-50% lower risk</td>
</tr>
<tr>
<td>Colon cancer</td>
<td>The most active individuals have a 40-50% lower risk</td>
</tr>
<tr>
<td>Breast cancer</td>
<td>More active women have a 30% lower risk</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>Being physically active reduces the risk of later hip fracture by up to 50%</td>
</tr>
</tbody>
</table>

Sources: Chief Medical Officer’s report on physical activity and a range of published studies – full references listed at the end of this report.
Health positively linked to health and wealth

- Almost 70% of adults don’t meet the target of 150 minutes exercise/week
- If every adult did an extra 12 minutes/day, the UK could save over £6 billion in associated NHS treatments, welfare and loss of earnings for mental health issues
- Low income households are less active
- Those who exercise earn an average of £6,500 more/year than those who don’t
<table>
<thead>
<tr>
<th>Country</th>
<th>Obesity Rate</th>
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<tbody>
<tr>
<td>USA</td>
<td>31%</td>
</tr>
<tr>
<td>Mexico</td>
<td>24%</td>
</tr>
<tr>
<td>UK</td>
<td>23%</td>
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<tr>
<td>Slovak Republic</td>
<td>22%</td>
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<tr>
<td>Greece</td>
<td>22%</td>
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<tr>
<td>Australia</td>
<td>22%</td>
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<tr>
<td>New Zealand</td>
<td>21%</td>
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<tr>
<td>Hungary</td>
<td>19%</td>
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<tr>
<td>Czech Republic</td>
<td>15%</td>
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<td>Canada</td>
<td>14%</td>
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<td>Spain</td>
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<td>Portugal</td>
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<td>Finland</td>
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<td>Turkey</td>
<td>12%</td>
</tr>
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<td>Belgium</td>
<td>12%</td>
</tr>
<tr>
<td>Poland</td>
<td>11%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>10%</td>
</tr>
<tr>
<td>Sweden</td>
<td>10%</td>
</tr>
<tr>
<td>Denmark</td>
<td>10%</td>
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<tr>
<td>France</td>
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<tr>
<td>Japan</td>
<td>3%</td>
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Source: http://www.WellingtonGrey.net
Percentage of U.S. Adults Who Were Obese or Had Diagnosed Diabetes

Centers for Disease Control and Prevention: National Diabetes Surveillance System.
County-level estimates of diagnosed diabetes among adults aged ≥ 20 years: United States 2008

County-level estimates of leisure-time physical inactivity among adults aged ≥ 20 years: United States 2008

Age-adjusted percent
Quartiles
- 0 - 7.5
- 7.6 - 8.7
- 8.8 - 10.3
- ≥ 10.4

Age-adjusted percent
Quartiles
- 0 - 23.2
- 23.3 - 26.2
- 26.3 - 29.1
- ≥ 29.2
Diabetes prevalence model

Map 1: Diabetes Prevalence by PCT, 2010

Map 2: Diabetes Prevalence by PCT, 2020

Map 3: Diabetes Prevalence by PCT, 2030
Male CVD death 30-64y

Obesity and the environment

Fast food outlets

Relationship between density of fast food outlets and deprivation by local authority

Fast food outlets per 100,000 population

Index of Multiple Deprivation (IMD) 2010
(higher score = more deprived)

R² = 0.48

England value
per 100,000 population

77.9

A new instrument for men with Metabolic Syndrome
One third of Yorkshire men are too fat to see their own genitals 1 Oct 12

New online men's health service launched a campaign to encourage men to watch their weight by checking if the view of their penis is obstructed.

WeLoveOurHealth.co.uk - Big Check Campaign.

One simple potentially lifesaving health check - "Can you see your manhood?"

importance of a man's waist measurement, rather than (BMI), for determining risk of developing weight-related illness such as stroke, diabetes and heart disease.

An obese man who can't see his penis is 5 x more likely to develop type 2 diabetes, 3 x more likely to develop cancer of the colon and 2.5 more likely to develop BP
% men surveyed who said their belly obstructs their view of their genitals:

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<tr>
<th>Region</th>
<th>Percentage</th>
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<tr>
<td>East Anglia</td>
<td>36.54%</td>
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<td>East Midlands</td>
<td>37.74%</td>
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<td>London</td>
<td>30.57%</td>
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<td>North East</td>
<td>35.19%</td>
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<td>North West</td>
<td>39.26%</td>
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<td>Northern Ireland</td>
<td>34.62%</td>
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<tr>
<td>Scotland</td>
<td>30%</td>
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<tr>
<td>South East</td>
<td>22.89%</td>
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<td>Wales</td>
<td>30.95%</td>
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<td>West Midlands</td>
<td>43.33%</td>
</tr>
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<td>Yorkshire and the Humber</td>
<td>38.20%</td>
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Lifestyle Interventions Summary

- Lifestyle intervention continues to have an effect; most drugs do not

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The best thing you can do is give up smoking, drinking and fried food.

What's the second best?
What % of cases of T2DM are attributed to poor lifestyle?:

1. 10%
2. 30%
3. 50%
4. 70%
5. 90%
Even later in life, combined lifestyle factors are associated with markedly lower incidence of T2DM.

- Prospective study 4883 US men & women 65yrs+ over 10yrs, incident T2DM 35% overall.

Risk of T2DM:
- 2 low risk factors, activity + diet 22.3%
- 3 as above + non smoker 12%
- 3 low risk factors, activity, diet, mod alcohol 12.8%
- 4 all of above (825 lower incidence) 6%
- 5 all + BMI < 25 or waist <92cm (88cm women) 3.4%
- 89% lower incidence (RR 1.1)
- 9/10 cases attributable to lifestyle

Arch Intern Med 2009;169(8):798-807
SAVING LIVES
Circulatory Disease Mortality Target
Death rates from All Circulatory Disease in England 1993-2006 and target
Persons under 75

Death rate per 100,000 population

Progress since baseline:
A fall of 40.3%

Target:
40% minimum reduction from 1995-97 baseline rate

Target achieved five years ahead of schedule

Immortality guaranteed by 2026

Rates are calculated using the European Standard Population to take account of differences in age structure.
ICD9 data for 1993 to 1998 and 2000 have been adjusted to be comparable with ICD10 data for 1999 and 2001 onwards.

Source: ONS (ICD9 390-459; ICD10 I00-I99)
Attributing the fall in CHD deaths to beneficial changes in risk factors or to better treatments

Redrawn from Capewell and colleagues
TIME

What to Eat Now

UNCOVERING THE MYTHS ABOUT FOOD BY DR. OZ
Mediterranean sea bordered by 20 countries

- The diet refers to the ingredients rather than the final dish.
- The olive & olive oil provide the identity of the diet.
- A balance of beauty, harmony & equilibrium
- Ferrari R, EHJ 2011 32, 2917
Study Overview

• In a randomized trial, participants assigned to a Mediterranean diet supplemented with either nuts or extra-virgin olive oil had a significantly lower rate of cardiovascular events at 4.8 years than participants assigned to a low-fat control diet.

A Primary End Point (acute myocardial infarction, stroke, or death from cardiovascular causes)

B Total Mortality

No. at Risk
Control diet 2450 2268 2020 1583 1268 946
Med diet, EVOO 2543 2486 2320 1987 1687 1310
Med diet, nuts 2454 2345 2093 1657 1389 1031
Mediterranean Diet: Primary Prevention of CVD
Primary Endpoint: Acute MI, Stroke, or CV Death

EVOO = extra-virgin olive oil

Systematic Reviews and Meta- and Pooled Analyses

Red Meat and Processed Meat Consumption and All-Cause Mortality: A Meta-Analysis

Susanna C. Larsson* and Nicola Orsini

* Correspondence to Dr. Susanna C. Larsson, Unit of Nutritional Epidemiology, Institute of Environmental Medicine, Karolinska Institutet, Box 210, SE-17177 Stockholm, Sweden (e-mail: susanna.larsson@ki.se).

American Journal of Epidemiology Advance Access published October 22, 2013
DO YOU KNOW THE DIFFERENCE BETWEEN FLORENCE AND NEW YORK?
AND NEW YORK...
Freshly Baked Bun
Crisp Chopped Lettuce
Beefsteak Tomatoes
Juicy Bacon
Gourmet Red Onion
Fresh Cheddar Cheese
1/2 Pound Beef!
Another Red Onion
More Cheese
Another 1/2 Pound Patty
Another Red Onion
More Cheese
Another 1/2 Pound Patty
Another Red Onion
More Cheese
Another 1/2 Pound Patty
More Bacon
Another Red Onion
More Cheese
Another 1/2 Pound Patty
Gourmet Sauce
Freshly Baked Bun
The evolution of man

How do we stop this?
Lifestyle intervention continues to have an effect; most drugs do not.

### Lifestyle Interventions Summary

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### Pharmacologic Interventions Summary

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Smoking

- Smoking increases the risk of CVD
  - Directly related to amount and duration of smoking

Smokers who quit with CVD
Smokers who quit after MI
Smokers who quit who were asymptomatic

Risk falls within 2-3 years to level of people with CVD who have never smoked
Relative odds of 0.54 for coronary mortality compared with those who continued to smoke
10 years to reach risk level of those who have never smoked

Amount of advice given on quitting directly related to success of quitting

1. Ban on advertising
2. Advertising campaigns
3. Pack health warnings
4. Price increases
5. Smoking cessation clinics
6. Ban on smoking in the workplace & public places
7. Legal age from 16 to 18
Advice *how* to stop

Appears to be better

<table>
<thead>
<tr>
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<th>No Pharmacotherapy</th>
<th>Pharmacotherapy</th>
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<tr>
<td>Willpower alone</td>
<td><strong>2-3%</strong> <em>(46% of attempts¹)</em></td>
<td><strong>4-6%</strong> <em>(49% of attempts¹)</em></td>
</tr>
<tr>
<td>Support (trained adviser)</td>
<td><strong>10-15%</strong></td>
<td><strong>20-30%</strong> <em>(4% of attempts¹)</em></td>
</tr>
</tbody>
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UK adults are amongst the least active in Europe

www.heartstats.org
Percentage of adults who do no moderate-intensity physical activity in a typical week, 2005, selected European countries.
Physical activity

- Sedentary lifestyle associated with increased risk of CVD
- Physical activity at work or leisure associated with lower risk of CVD

- Physical activity benefits other cardiovascular risks
  - Controls body weight - prevents weight gain
  - Prevents or delays development of high BP
  - Increases HDL
  - Lowers risk of developing diabetes

The Exercise Test
Diabetogenic effects of obesity moderated by exercise

- Single bout of exercise can improve insulin sensitivity for 16 hours.
- Multiple bouts have additive effects and improve lipid profiles.

*Borghouts LB. Inj J Sports Med 2000:21(1)1-12*
Time to start?

- Cohort 2205 Swedish men 50yrs in 1970-3 followed for 35yrs
- Increased activity in middle age is eventually followed by a reduction in mortality. (after 5-10yrs)
- Relative rate reduction 32% for high & 22% for medium activity
- Reduction in mortality is equivalent to stopping smoking (0.51 0.26-0.97)

BMJ 2009;338:688
“What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?”
EXERCISE CAPACITY AND MORTALITY AMONG MEN REFERRED FOR EXERCISE TESTING

JONATHAN MYERS, Ph.D., MANISH PRAKASH, M.D., VICTOR FROELICHER, M.D., DAT DO, M.D., SARA PARTINGTON, B.Sc., AND J. EDWIN ATWOOD, M.D.
Each 1-MET increase in Exercise Capacity Conferred a 12% improvement in survival

Myers J et al. NEJM 2002;346:793
What exercise capacity can you achieve?

Fig. 1: Relative risks of death from any cause among participants with various risk factors (e.g., history of hypertension, chronic obstructive pulmonary disease [COPD], diabetes, smoking, elevated body mass index [BMI ≥ 30] and high total cholesterol level [TC ≥ 5.70 mmol/L]) who achieved an exercise capacity of less than 5 METs (metabolic equivalents) or 5–8 METs, as compared with participants whose exercise capacity was more than 8 METs. Error bars represent 95% confidence intervals. Adapted, with permission, from Myers et al. (N Engl J Med 2002;346:793-801). Copyright © 2002 Massachusetts Medical Society. All rights reserved.
The Exercise Test
I NAMED MY DOG "5 MILES" SO I CAN TELL PEOPLE I WALK 5 MILES EVERY DAY
"Tell a man something and he forgets,

Show a man something and he remembers,

Make a man do something and he understands"

Chinese Philosopher
You can’t throw a habit out of the window, you have to coax it downstairs one step at a time!

Mark Twain
"Although most patients are aware of the benefits of exercise, and a healthy diet.

It is up to us to move them from wishful thinking to a practical reality and move them from contemplation to the action phase.

"Even with one minute of counselling, it is our attitude and our commitment toward emphasizing the importance of diet and exercise or the harm of inactivity that may move patients.

A simple message, delivered with sincerity, needs to be repeated every time we encounter our patients."