

# Cancer Survivorship and lifestyle

## Evidence for lifestyle change

### Breast and colorectal



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# Living with cancer

- ❑ Survivorship- **breast, colorectal** and prostate (5 year survival rates)
- ❑ Most will be over the age of 65 years
- ❑ Long term health effects- co-morbidities
- ❑ CVD, diabetes, osteoporosis- potential link with diet and activity
- ❑ Functional limitations- ability to work and live independently
- ❑ Costs- personal and state



<http://www.dietandcancerreport.org>

Cancers of 17 sites – 80% of incidence and deaths worldwide

## RECOMMENDATIONS

### BODY FATNESS

Be as lean as possible within the normal range of body weight

### PHYSICAL ACTIVITY

Be physically active as part of everyday life

### FOODS AND DRINKS THAT PROMOTE WEIGHT GAIN

Limit consumption of energy-dense foods  
Avoid sugary drinks

### PLANT FOODS

Eat mostly foods of plant origin

### ANIMAL FOODS

Limit intake of red meat and avoid processed meat

### ALCOHOLIC DRINKS

Limit alcoholic drinks

### PRESERVATION, PROCESSING, PREPARATION

Limit consumption of salt  
Avoid mouldy cereals (grains) or pulses (legumes)

### DIETARY SUPPLEMENTS

Aim to meet nutritional needs through diet alone

### BREASTFEEDING

Mothers to breastfeed; children to be breastfed

### CANCER SURVIVORS

Follow the recommendations for cancer prevention

# WCRF Global Recommendations

The Panel emphasises the importance of not smoking and of avoiding exposure to tobacco smoke

# Body Fatness

**RECOMMENDATION 1**

**BODY FATNESS**

Be as lean as possible within the normal range<sup>1</sup> of body weight

**PUBLIC HEALTH GOALS**

Median adult body mass index (BMI) to be between 21 and 23, depending on the normal range for different populations<sup>2</sup>

The proportion of the population that is overweight or obese to be no more than the current level, or preferably lower, in 10 years

**PERSONAL RECOMMENDATIONS**

Ensure that body weight through childhood and adolescent growth projects<sup>3</sup> towards the lower end of the normal BMI range at age 21

Maintain body weight within the normal range from age 21

Avoid weight gain and increases in waist circumference throughout adulthood

<sup>1</sup> 'Normal range' refers to appropriate ranges issued by national governments or the World Health Organization.  
<sup>2</sup> To assess the proportion of the population outside the normal range.  
<sup>3</sup> 'Projects' in this context means following a pattern of growth (weight and height) throughout childhood that leads to adult BMI at the lower end of the normal range. Such patterns of growth are specified in International Obesity Task Force and WHO growth reference charts.



63.3% of Scots are overweight or obese....

# Physical Activity

SCOTLAND  
Meeting current  
guidelines  
32% aged 55 to 64  
19% aged 65 to 74  
8% aged 75 +

**RECOMMENDATION 2**

**PHYSICAL ACTIVITY**

Be physically active as part of everyday life

**PUBLIC HEALTH GOALS**

The proportion of the population that is sedentary<sup>1</sup> to be halved every 10 years

Average physical activity levels (PALs)<sup>1</sup> to be above 1.6

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**PERSONAL RECOMMENDATIONS**

Be moderately physically active, equivalent to brisk walking,<sup>2</sup> for at least 30 minutes every day

As fitness improves, aim for 60 minutes or more of moderate, or for 30 minutes or more of vigorous, physical activity every day<sup>2,3</sup>

Limit sedentary habits such as watching television

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<sup>1</sup> The term 'sedentary' refers to a PAL of 1.4 or less. PAL is a way of representing the average intensity of daily physical activity. PAL is calculated as total energy expenditure as a multiple of basal metabolic rate.

<sup>2</sup> Can be incorporated in occupational, transport, household, or leisure activities.

<sup>3</sup> This is because physical activity of longer duration or greater intensity is more beneficial.

← Cancer reduction



Overweight  
and obesity  
reduction

# Foods and drinks that promote weight gain

Energy density of Scottish diet 168-177 kcals per 100g

**RECOMMENDATION 3**

**FOODS AND DRINKS THAT PROMOTE WEIGHT GAIN**

**Limit consumption of energy-dense foods<sup>1</sup>**  
**Avoid sugary drinks<sup>2</sup>**

**PUBLIC HEALTH GOALS**

Average energy density of diets<sup>3</sup> to be lowered towards 125 kcal per 100 g

Population average consumption of sugary drinks<sup>2</sup> to be halved every 10 years

**PERSONAL RECOMMENDATIONS**

Consume energy-dense foods<sup>1 4</sup> sparingly

Avoid sugary drinks<sup>2</sup>

Consume 'fast foods'<sup>5</sup> sparingly, if at all

<sup>1</sup> Energy-dense foods are here defined as those with an energy content of more than about 225–275 kcal per 100 g

<sup>2</sup> This principally refers to drinks with added sugars. Fruit juices should also be limited

<sup>3</sup> This does not include drinks

<sup>4</sup> Limit processed energy-dense foods (also see recommendation 4). Relatively unprocessed energy-dense foods, such as nuts and seeds, have not been shown to contribute to weight gain when consumed as part of typical diets, and these and many vegetable oils are valuable sources of nutrients

<sup>5</sup> The term 'fast foods' refers to readily available convenience foods that tend to be energy-dense and consumed frequently and in large portions

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# WCRF (2007)

- *“ Evidence on effects of food, nutrition and physical activity in cancer survivors is in early stages...*
- *Scale and heterogeneity of the field.. evidence is inconclusive*
- *Regular physical activity and other measures that control weight may help to prevent recurrence of breast cancer and improve quality of life*
- *No support for high dose supplements as a means of improving outcomes*

# Nutrition and Physical Activity During and After Cancer Treatment: An American Cancer Society Guide for Informed Choices



## Nutrition and Physical Activity During and After Cancer Treatment: An American Cancer Society Guide for Informed Choices

For cancer survivors who are overweight or obese, modest weight loss (ie, a maximum of 2 pounds per week)<sup>75,76</sup> can be encouraged during treatment, as long as the treating oncologists approve, weight loss is monitored closely, and weight loss does not interfere with treatment.

After cancer treatment, weight gain or loss should be managed with a combination of dietary and physical activity strategies. For some who need to gain weight, this means increasing energy intake (food intake) to exceed energy expended,

## Department of Health (2011) UK Physical Activity guidelines

### American College of Sports Medicine- exercise guidelines for cancer survivors

- Be active Daily
- Over a week , activity should be 150 mins (2.5 h) of moderate intensity activity in bouts of >10 mins e.g. 30 mins on at least 5 days per week
- Or 75 mins vigorous activity or a combination
- Undertake physical activity to improve muscle strength on at least 2 days per week
- Minimise the amount of time spent sitting for extended periods

# Remember...

- Physical activity recommendations for overweight/obese are 225 – 300 minutes per week e.g. five sessions of 45 to 60 minutes
- (SIGN, 2010)

# Evidence – Based Nutrition Guidelines for Cancer Survivors: Current Guidelines, Knowledge gaps and Future research Directions

Robein K, Demark-Wahnfried W, Rock CL  
(2011)

Updated evidence in support of diet and exercise interventions in cancer survivors

Pekmezi DW & Demark-Wahnfried W  
(2001)

# Breast Cancer

- Mostly observational studies
  - Diet
  - Body weight
  - Physical activity

# Dietary patterns

- Kroenke et al (2005) (**Nurses Health Study**) Prudent diet unrelated to breast cancer survival but inversely associated non breast cancer deaths
- Kwan et al (2009) (**Life after cancer study**) Prudent diet decrease risk of overall death and death from non-cancer causes



Post diagnosis diet quality,  
the combination of diet quality and recreational physical activity.....

***George et al Cancer Causes Control (2011) 22;589-598***

- Multiethnic, prospective observational cohort (n=670)
- 30 months after diagnosis, followed up 6 years
  
- Women with better- quality diets (healthy eating index) had  
**60% reduced risk of death from any cause**  
**88% reduced risk of death from breast cancer**
  
- Women with better- quality diets AND any leisure physical activity had  
**89% reduced risk of death from any cause**  
**91% reduced risk of death from breast cancer**

**Table 1** Components of the Healthy Eating Index 2005 (36)

Component <sup>a</sup>	Maximum points	Standard for maximum score	Standard for minimum score of zero
Total fruit (includes 100% juice)	5	≥0.6 cup equiv. per 1,000 kcal	No fruit
Whole fruit (not juice)	5	≥0.4 cup equiv. per 1,000 kcal	No whole fruit
Total vegetables	5	≥1.1 cup equiv. per 1,000 kcal	No vegetables
Dark green and orange vegetables and legumes <sup>b</sup>	5	≥0.4 cup equiv. per 1,000 kcal	No dark green and orange vegetables or legumes
Total grain	5	≥1.0 oz equiv. per 1,000 kcal	No grain
Whole grains	5	≥1.5 oz equiv. per 1,000 kcal	No whole grains
Milk <sup>c</sup>	10	≥1.1 cup equiv. per 1,000 kcal	No milk
Meat and beans	10	≥2.5 oz equiv. per 1,000 kcal	No meat or beans
Oil <sup>d</sup>	10	≥12 grams per 1,000 kcal	No oil
Saturated fat	10	≤7% of energy <sup>e</sup>	≥15% of energy
Sodium	10	≤0.7 gram per 1,000 kcal <sup>e</sup>	≥2.0 grams per 1,000 kcal
Calories from solid fat, alcoholic beverages, and added sugars	20	≤30% of energy	≥50% of energy

# Alcohol and breast cancer survivorship

- Little data
- Sample sizes, study design data collection
- Correlation with other lifestyle factors
- ACS- tailored guidance cardio-protective versus cancer risk

(Many routes for cardio-protection!!!)

# Dietary Supplements

- BEWARE!!!
- 57 to 87% US breast cancer survivors initiate supplements after diagnosis
- Unlikely to improve prognosis
- May INCREASE mortality
- May be a role for standard multi vitamins/minerals during and after cancer treatments if deficiency or cannot take meet nutritional needs through diet- not routine needs

# Diet trials in cancer survivors

- **WINS** Women's Intervention Nutrition Study
- **WHEL** Woman's Healthy Eating and Living trial

2007

*JAMA*. 2007 July 18; 298(3): 289–298.

**Influence of a Diet Very High in Vegetables, Fruit, and Fiber and Low in Fat on Prognosis Following Treatment for Breast Cancer:**

The Women's Healthy Eating and Living (WHEL) Randomized Trial

**Conclusions:** Among survivors of early stage breast cancer, adoption of a diet that was very high in vegetables, fruit and fibre and low in fat did not reduce additional breast cancer events or mortality during a 7.3 years follow up period.

# Further work....

## ■ WHEL...

- Those who followed diet AND exercised 30 mins on 6/7 days lower recurrence and better survival (Bertram et al, 2011)
- Women with lowest carotinoids (markers for fruit and veg) – high risk of recurrence
- High Cruciferous Veggie at baseline lower recurrence esp for those on tamoxifen

2006

## **Dietary Fat Reduction and Breast Cancer Outcome: Interim Efficacy Results From the Women's Intervention Nutrition Study**

*Rowan T. Chlebowski, George L. Blackburn, Cynthia A. Thomson, Daniel W. Nixon, Alice Shapiro, M. Katherine Hoy, Marc T. Goodman, Armando E. Giuliano, Njeri Karanja, Philomena McAndrew, Clifford Hudis, John Butler, Douglas Merkel, Alan Kristal, Bette Caan, Richard Michaelson, Vincent Vinciguerra, Salvatore Del Prete, Marion Winkler, Rayna Hall, Michael Simon, Barbara L. Winters, Robert M. Elashoff*

**Conclusions:** A lifestyle intervention reducing dietary fat intake, **with modest influence on body weight, may improve relapse-free survival of breast cancer patients receiving conventional cancer management.**



# Body weight

- Obesity at diagnosis (50 to 65% have BMI  $>25\text{kg/m}^2$ )
  - .. Increased risk of recurrence (Chlebowski et al, 2002)
  - ....decreased survival (Stephenson, 2003)
  - ...breast cancer deaths (Rock & Demark-Wahnefried, 2002)
  - ...all-cause mortality (Carmichael, 2006)

# Weight gain

## Weight gain after diagnosis

- 60 to 96% experience weight gain (Vance et al, 2010)
- In HEAL mean increase over 2 years **3.9kg** (range 0.1 to 27.0kg)
- Weight gain associated with type and duration of treatment
- More common during adjuvant treatment, esp longer duration, more pronounced in pre-menopausal
- Chemotherapy patients 65% more likely to gain weight (WHEL)

## Weight gain and lifestyle change.

- Evidence for energy increase (difficult to capture)
- Evidence for PA decrease more evident...
- Thus greater emphasis on decreasing PA for weight loss

# Capturing increases in caloric intake

- People with excess weight under-report energy intake, as the nation get fatter our calorie intake apparently goes down!!!
- Social bias, uncertainty of food composition, change diet in recording period
- Instruments poor at recording modest changes in intake

# Weight gain

- **3.9 kg** = 3900g x 7 kcals = 27300kcals  
excess to requirements.....
- 27300 / 730 days = **37 extra calories per day**.....

e.g. 1 tablespoon cooked pasta

Or 2 squares of chocolate

Or 1 /5 th of a Starbucks latte

Or small apple

# Weight gain effects

- ❑ poor quality of life
- ❑ increased risk of co-morbidities
- ❑ distressing for women

Disease free survival **equivocal**

(breast cancer recurrence or breast cancer mortality)

Ten studies (4/10 showing effect) (Vance et al, 2010)

- Consistent timing of weight measures
- Definition of recurrence end points
- Weight gain beyond one year

Note – in primary prevention : 2-5 kg wt gain after age 50 associated with 30% increase risk

# Breast cancer risk reduction compared to weight loss in 3 RCTs

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	Wt loss	BC reduction
WHEL	0 pounds	0%
(WHI	2 pounds	9%)
WINS	6 pounds	20%

NOTE – no trials of weight loss for primary or secondary occurrence have yet reported

# Physical Activity

- Observational data are not consistent
- Majority (9/15) of studies suggest a decreased risk of breast cancer mortality associated with increased pre (and/or post) diagnosis activity
- Decrease in breast cancer mortality may be around 30%
- Sub groups of population may experience benefits differently

Friedenreich (2010)

# Trials of physical activity

- No Exercise trials with survivorship endpoints
- Exercise is a safe and effective way to provide rehabilitation for cancer survivors
- Short term interventions HAVE demonstrated
  - Improved aerobic capacity
  - Strength
  - Body composition
  - Quality of life
  - Reduced fatigue
  - Emotional distress
  - Lymphedema symptoms



# Conclusions- breast cancer

- Weight management
  - Physical activity beneficial
  - Dietary patterns suggest strong effect
  - Fruit and veg important but overall energy density needs greater consideration
  - Alcohol limits
- Wide range of health benefits beyond breast cancer end points

# Colorectal cancer– observational studies

- Diet
- Physical Activity
- Body weight

Vrieling A & Kampman E (2010) The role of body mass index, physical activity, and diet in colorectal cancer **recurrence and survival**: a review of the literature.

- 31 observational studies
- 21 BMI, 12 Nutrition, 6 Physical activity
- Most referred to the time at or before diagnosis only 1 BMI, 4 Phys Act and 5 Nutrition studies made assessment *after* diagnosis

# Body Mass Index

There may be an association between higher BMI and body fat *before or at the time of diagnosis* with

Higher all –cause mortality

CRC specific mortality or recurrence

NOTE- Results may differ by sex, tumour location and molecular sub type

# Physical Activity

There may be an association between higher leisure time physical activity *after diagnosis* with

Lower all –cause mortality  
CRC specific mortality

# Diet

Only associations were with single foods, nutrients and dietary patterns in single studies

# Dietary patterns

## **Association of dietary patterns with cancer recurrence and survival in patients with stage III colon cancer (Meyerhardt et al, 2007)**

- Prospective observational study of 1009 patients with stage III colon cancer who were enrolled in a randomized adjuvant chemotherapy trial
- Median follow-up of 5.3 years for the overall cohort
- Compared with patients in the lowest quintile of Western dietary pattern, those in the highest quintile experienced poorer rates of disease-free survival, recurrence-free survival and overall survival

# Colorectal Cancer – Trials

No lifestyle trials with cancer survivorship end points have reported



**Effects of Home-Based Diet and Exercise on Functional Outcomes Among Older, Overweight Long-term Cancer Survivors**  
RENEW: A Randomized Controlled Trial

Physical Activity, diet, quality of life , weight loss physical functioning was significantly better in intervention group

**A telephone-delivered lifestyle intervention for colorectal cancer survivors 'CanChange': a pilot study**

Multi-component intervention with measures on symptom management QoL, health outcomes lifestyle variables... has proceeded to full trial

**"It makes you feel so full of life" LiveWell, a feasibility study of a personalised lifestyle programme for colorectal cancer survivors**

Highlighted importance of tailored advice, personalised feedback and family support

# On – going trials

- The Colon Health and Life Long Exercise Challenge (CHALLENGE) trial (n= 962) (Canada) (10 year FU, 16% recruited)
- **Disease free survival**
- Randomised controlled trial (n=40) of a supervised exercise rehabilitation program for colorectal cancer survivors immediately after chemotherapy (Australia)
- **cardio-respiratory fitness, biomarkers of health, survival, fatigue and quality of life.**

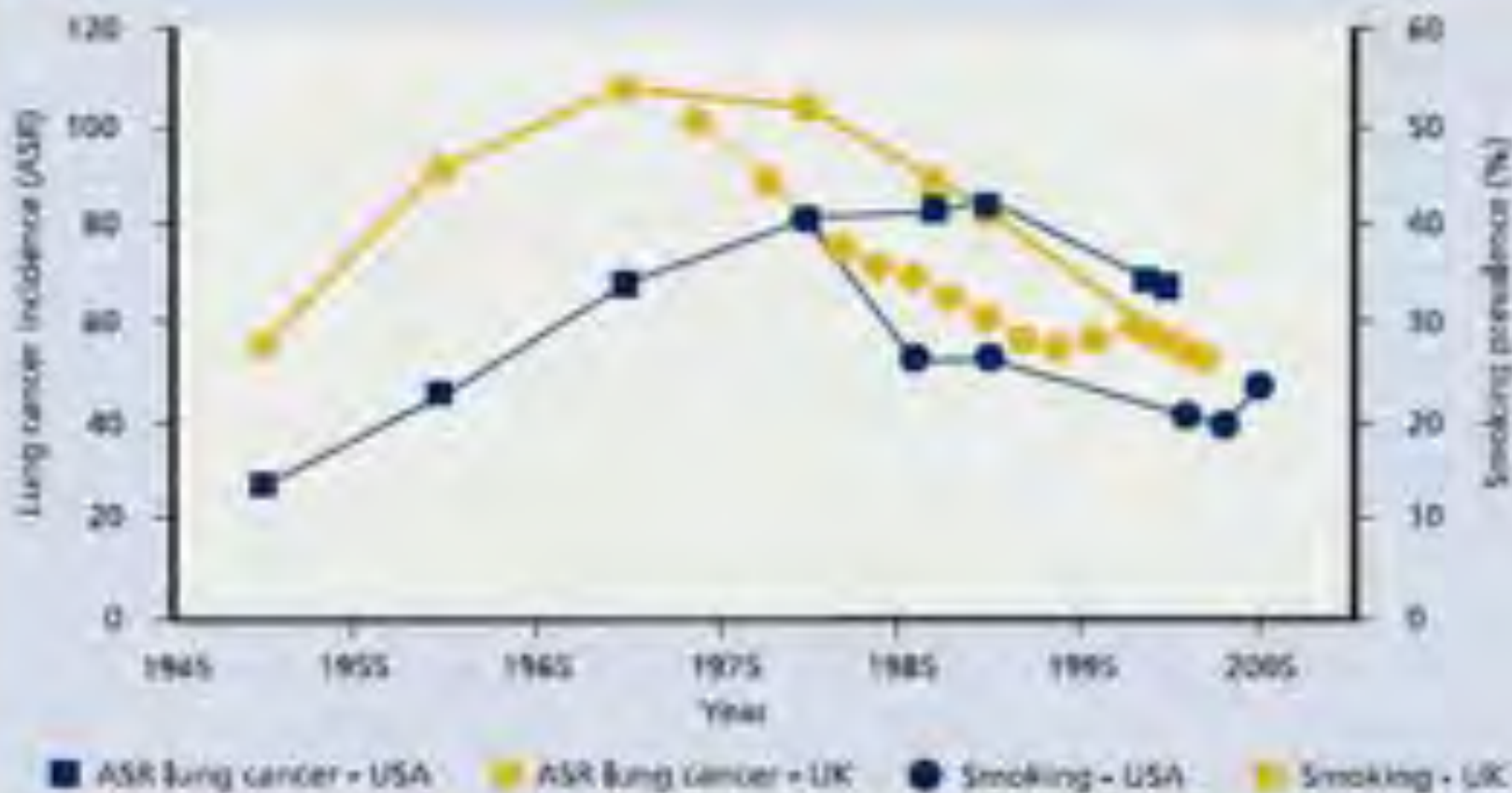
# Conclusions- colorectal cancer

- Little data on BMI, diet and physical activity and all cause or CRC specific mortality
- Physical activity interventions look promising
- BMI and weight management relevant
- Overall diet (dietary patterns) merit further investigation

# Overall conclusions

- Recent evidence on lifestyle and recurrence/survival for breast and colorectal cancer supports current recommendations from WCRF/ACS
- There are no indications of harm from lifestyle achievements
- Future cohort work and trials will support the evidence base but enough evidence to act now

**Figure 2.8 Smoking and lung cancer. Experiences in two countries**



Data from World Cancer Incidence and Mortality (WCRF)



- Biggest challenge is putting current evidence into practice