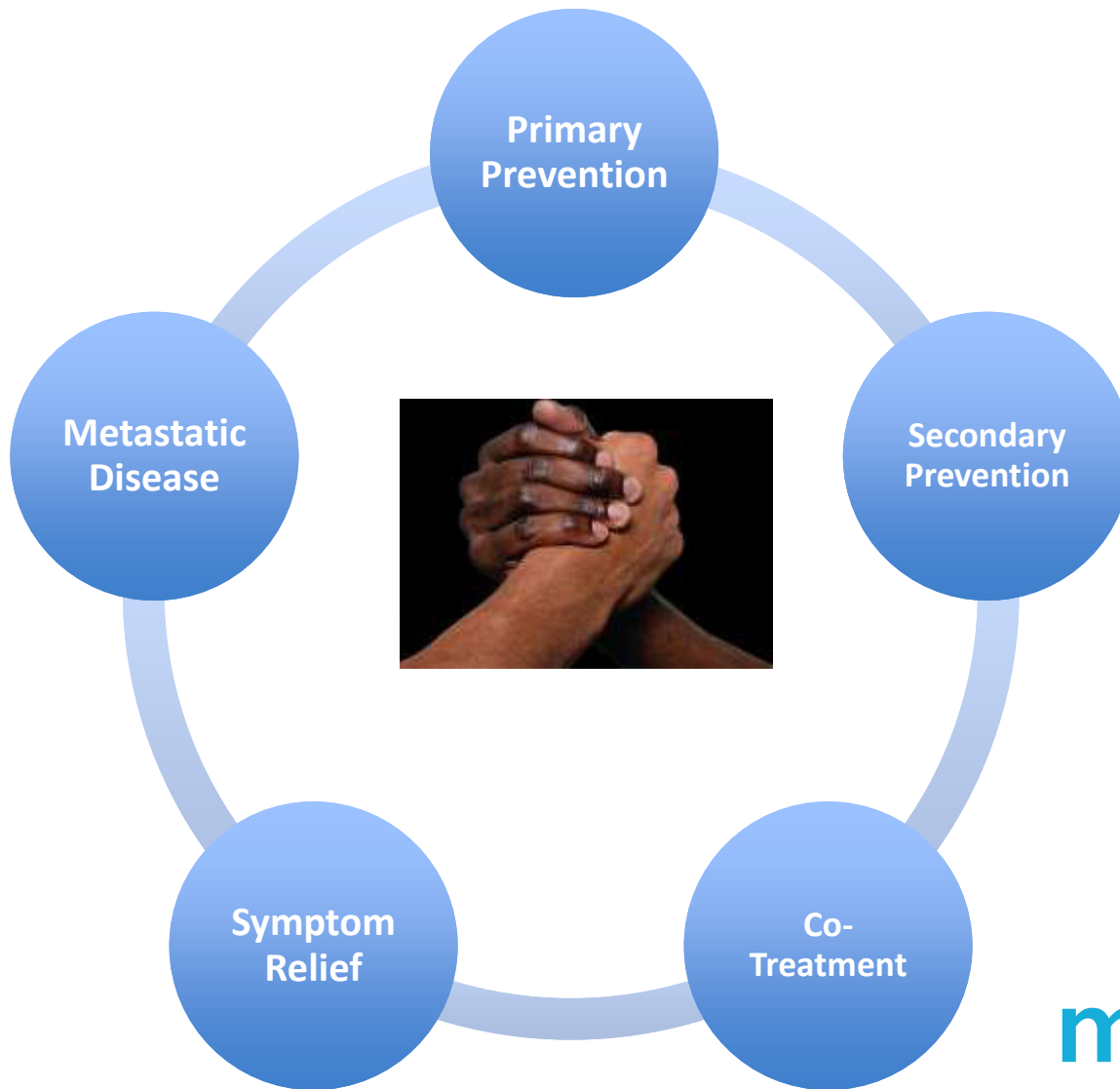


The Effect of Natural Therapies and CTC Testing on Patients with Cancer

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FACNEM, FSAARMM

AONM Webinar August 2020



maintrac

INFO from: Cancerresearchuk.org



Cases

367,167



New cases of cancer,
2015-2017, UK.

Deaths

164,901



Deaths from cancer,
2015-2017, UK.

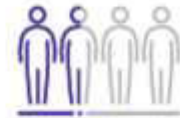
Survival

50%



Survive cancer for 10
or more years, 2010-
11, England and
Wales

Preventable cases



38%

Cancer cases are
preventable, UK,
2015

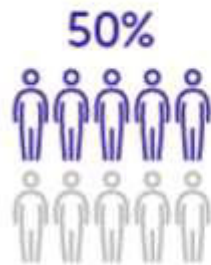
Cancer incidence for all cancers combined

- There are around 367,000 new cancer cases in the UK every year, that's around 1,000 every day (2015-2017).
- In females in the UK, there were more than 179,000 new cancer cases in 2017.
- In males in the UK, there were around 187,000 new cancer cases in 2017.
- Every two minutes someone in the UK is diagnosed with cancer.
- Since the early 1990s, incidence rates for all cancers combined have increased by more than a tenth (12%) in the UK. Rates in females have increased by almost a sixth (16%), and rates in males increased by less than a twentieth (2%) (2015-2017).
- Over the last decade, incidence rates for all cancers combined have increased by a twentieth (5%) in the UK. Rates in females have increased by around a twentieth (6%), and rates in males have increased by less than a twentieth (1%) (2015-2017).
- Almost half of cancers are diagnosed at a late stage in England (2014) and Northern Ireland (2010-2014).
- Incidence rates for all cancers combined are projected to rise by 2% in the UK between 2014 and 2035, to 742 cases per 100,000 people by 2035.
- An estimated 2,273,200 people who had previously been diagnosed with cancer were alive in the UK at the end of 2013.
- UK incidence is ranked higher than two-thirds of Europe.
- UK incidence is ranked higher than 90% of the world.

Cancer incidence for common cancers

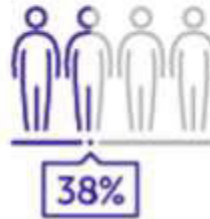
- Breast, prostate, lung and bowel cancers together accounted for more than half (53%) of all new cancer cases in the UK in 2017.
- Thyroid and liver cancers have shown the fastest increases in incidence in both males and females over the past decade in the UK (2015-2017).
- Incidence of kidney cancer, melanoma skin cancer, and head and neck cancers has also increased markedly in females over the past decade in the UK (2015-2017).
- Incidence of melanoma skin cancer, kidney cancer and Hodgkin lymphoma has also increased markedly in males over the past decade in the UK (2015-2017).
- Cancer of unknown primary and stomach cancers have shown the fastest decreases in incidence in both males and females over the past decade in the UK (2015-2017).

Lifetime risk



1 in 2 UK people will be
diagnosed with cancer
in their lifetime

Prevention



Cancer cases are
preventable, UK, 2015

Smoking

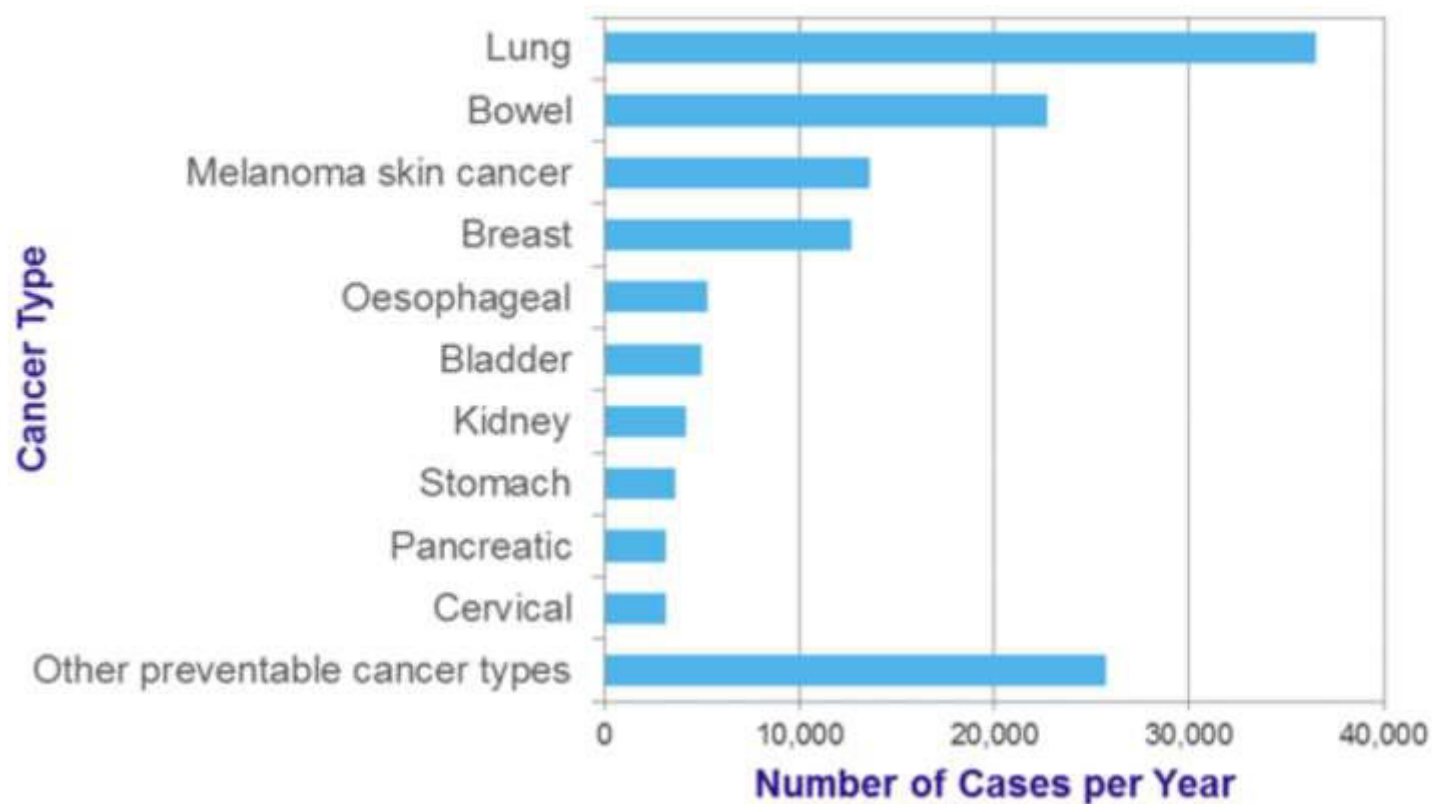


Smoking is the largest
single preventable
cause of cancer each
year in the UK

Preventable cancers

- A person's risk of developing cancer depends on many factors, including age, genetics, and exposure to risk factors.
- Around 4 in 10 UK cancer cases every year could be prevented, that's more than 135,000 every year.
- Nearly 112,000 England cases, around 13,000 Scotland cancer cases, around 7,200 Wales cancer cases, and around 3,500 Northern Ireland cancer cases every year could be prevented.
- Lung cancer, bowel cancer, melanoma skin cancer, and breast cancer together account for almost two-thirds of all preventable cancer cases in the UK.
- For 10 cancer types, including two of the five most common cancer types in the UK (lung cancer and melanoma skin cancer), more than 70% of UK cancer cases were attributable to known risk factors.
- Smoking is the largest cause of cancer in the UK.
- Overweight and obesity is the UK's biggest cause of cancer after smoking.
- Overexposure to ultraviolet (UV) radiation, exposure to certain substances at work, exposure to certain infections, drinking alcohol, and eating too little fibre each cause 3-4% of cancer cases in the UK.
- Exposure to ionising radiation and eating processed meat each cause 1-2% of cancer cases in the UK.
- Exposure to outdoor air pollution and doing too little physical activity each cause 1% or less of cancer cases in the UK.

Cancer Types with Largest Number of Preventable Cases, UK, Persons, 2015



Breast cancer risk

- A person's risk of developing cancer depends on many factors, including age, genetics, and exposure to risk factors (including some potentially avoidable lifestyle factors).
- 1 in 7 UK females will be diagnosed with breast cancer in their lifetime.
- 23% of breast cancer cases in the UK are preventable.
- Less than 1% of breast cancer cases in the UK are caused by oral contraceptives.
- 2% of breast cancer cases in the UK are caused by post-menopausal hormones.
- 8% of breast cancer cases in the UK are caused by overweight and obesity.
- 8% of breast cancer cases in the UK are caused by alcohol drinking.
- 5% of breast cancer cases in the UK are caused by not breastfeeding.

Obesity's Link to Cancer

"Obesity is on its way to replacing tobacco as the number one preventable cause of cancer. We need to confront this growing problem and develop all the necessary tools to limit its impact." - Clifford Hudis, MD, 2013-2014 ASCO President

Obesity Increases Cancer Risk

Cancers Linked to Obesity

Men

Head/neck
Esophagus
Pancreas
Kidney
Colon
Rectum
Prostate



Women

Head/neck
Esophagus
Breast
Pancreas
Kidney
Colon
Rectum
Endometrium



In 2007, more than **84,000** new cancer cases were due to obesity.

The percentage of cancer cases attributed to obesity varies, but is as high as **40%** for some cancers, particularly esophageal and endometrial.



Overweight/obesity contributes to as many as **1 in 5** cancer-related deaths.

Mechanisms Linking Obesity and Cancer



Obese people often have increased levels of **insulin** and insulin-like growth factor-1 (IGF-1) in their blood, which may promote the development of certain tumors.



Fat tissue produces higher amounts of **estrogen**, which may drive development of certain obesity-related cancers, including estrogen-sensitive breast cancers and endometrial cancer.

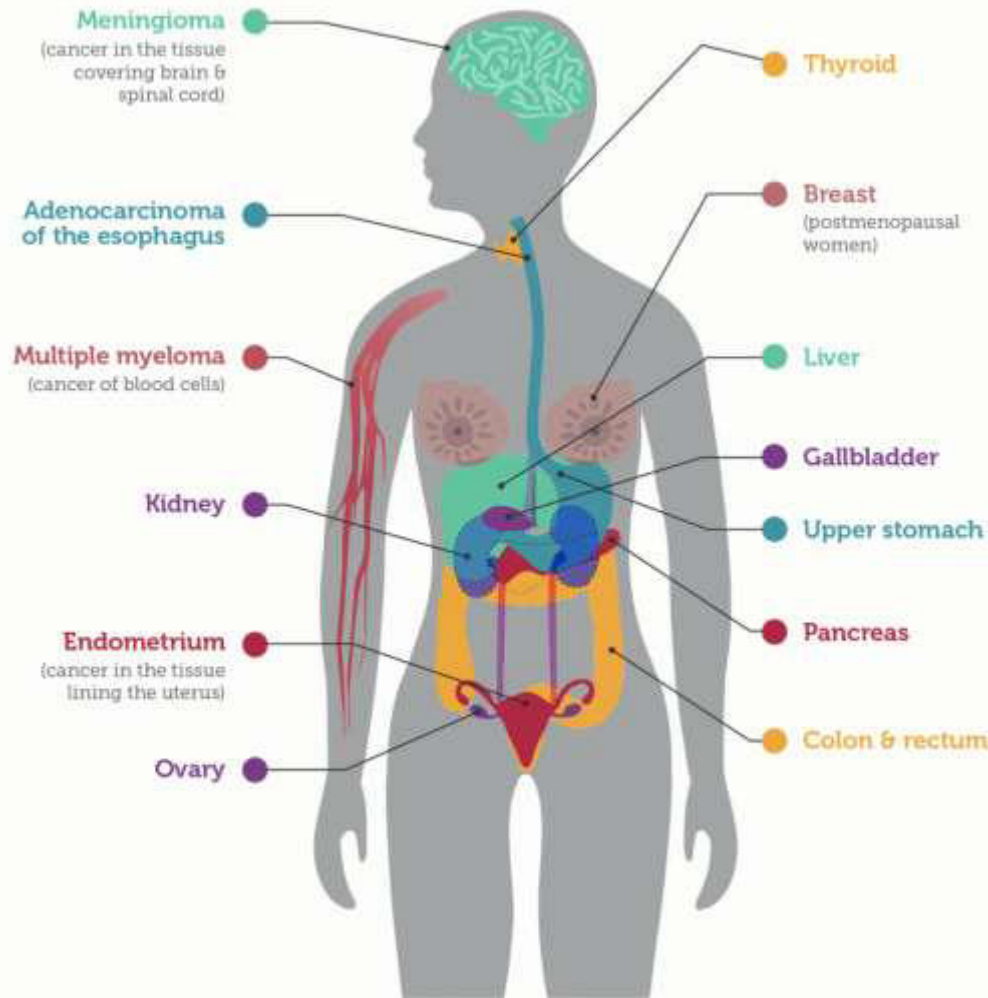


Obese people often have chronic low-level, or "subacute," inflammation, which has been associated with increased cancer risk.



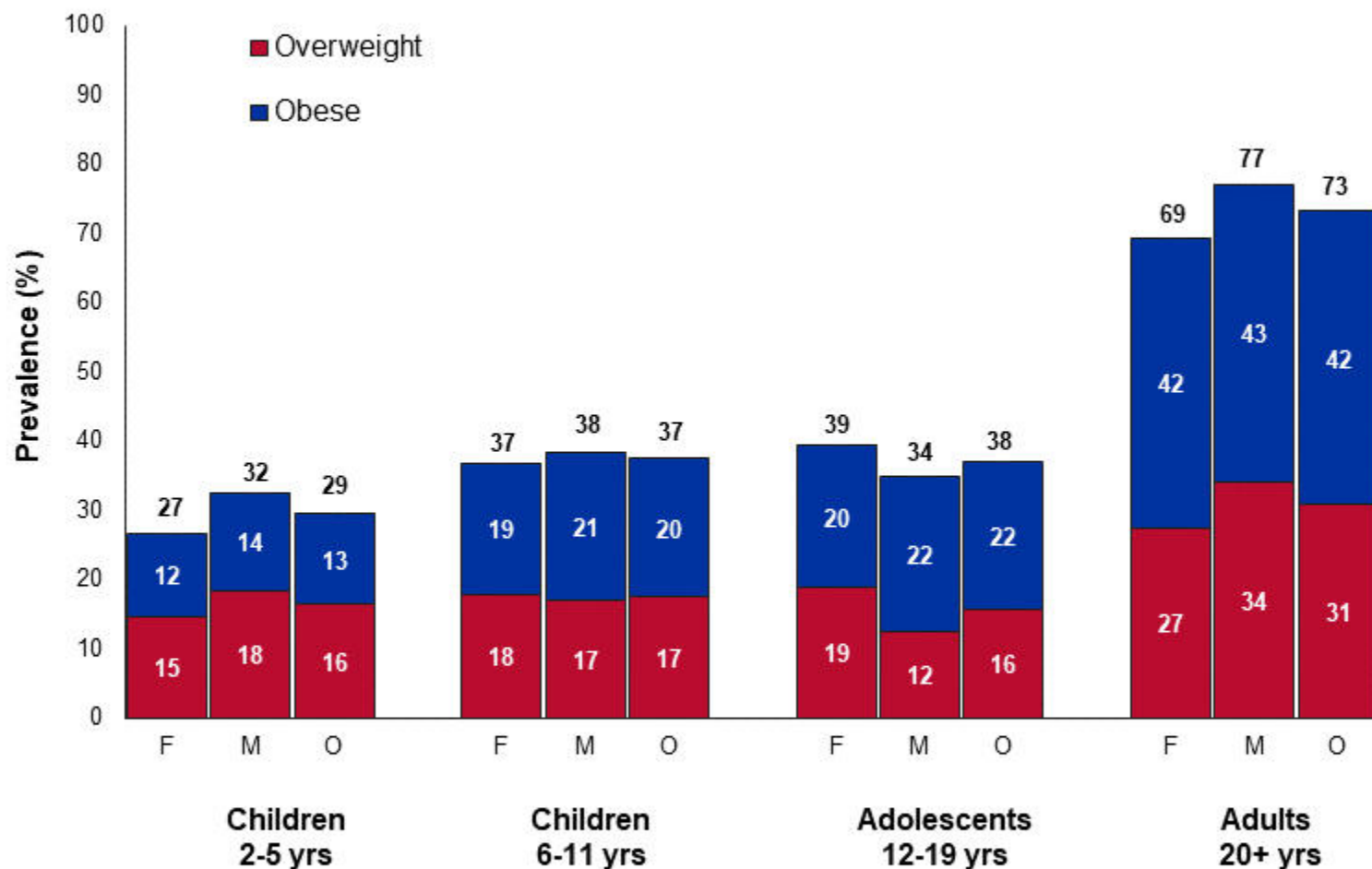
Fat cells (adipocytes) may also have effects on certain tumor growth regulators.

Cancers Associated with Overweight & Obesity



cancer.gov/obesity-fact-sheet
Adapted from Centers for Disease Control & Prevention

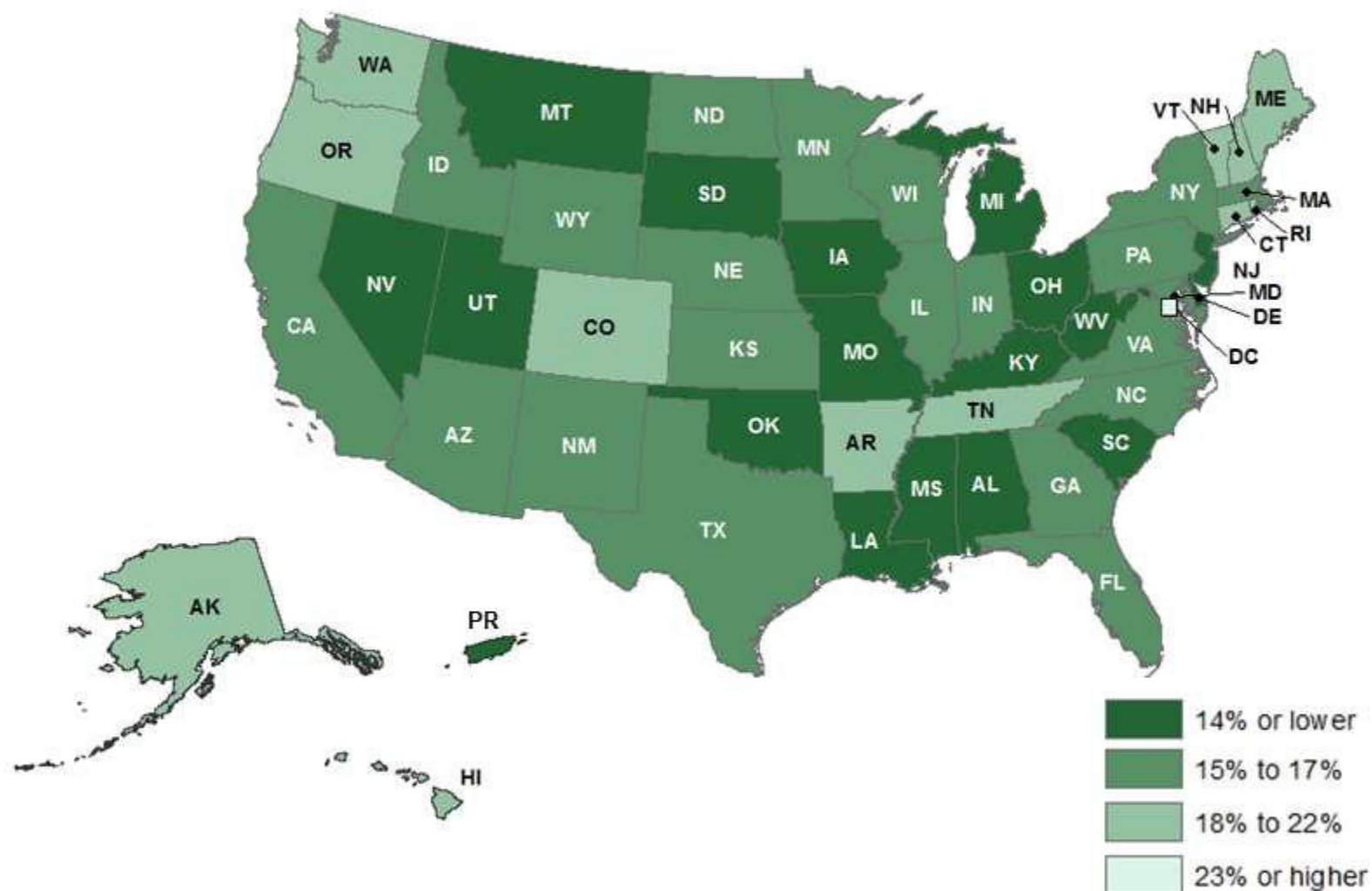
Excess Body Weight by Age and Sex, US, 2017-2018



*For adults, a BMI of 25.0-29.9 kg/m² is overweight; a BMI of ≥30.0 kg/m² is obese. Excess body weight is a BMI of ≥25.0 kg/m². For youth (ages 2-19 years), BMI is based on percentile rankings of the individual's height and weight on age- and sex-specific growth charts; BMIs between the 85th and 94.9th percentile are considered overweight, and BMIs at or above the 95th percentile are classified as obese. Note: Estimates for adults are age-adjusted to the 2000 US standard population.

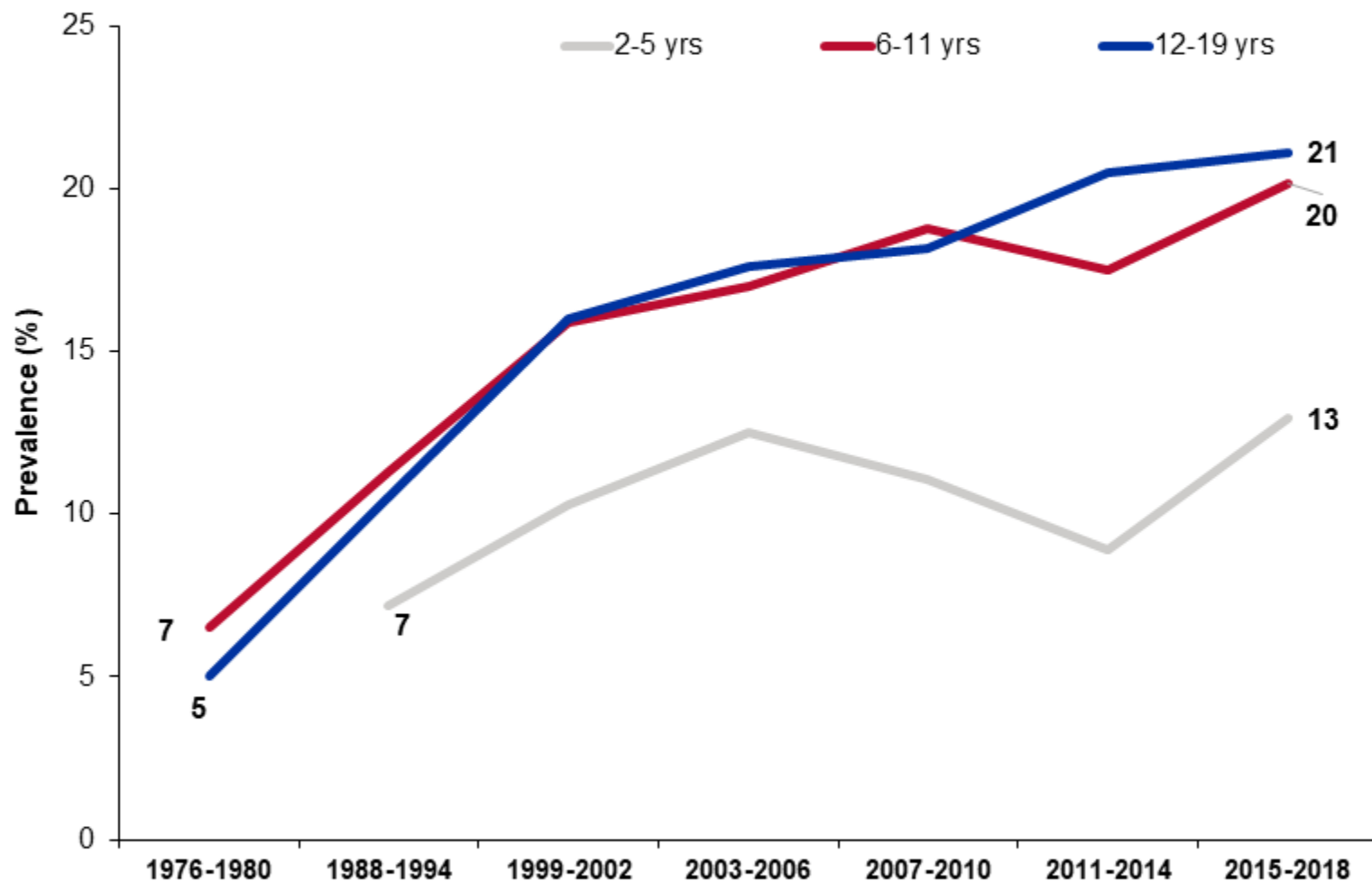
Source: National Health and Nutrition Examination Survey, see notes for citation.

Vegetable Consumption (3+ servings per day) by State, Adults 18 Years and Older, US, 2017



Source: Behavioral Risk Factor Surveillance System, see notes for citation.

Trends in Obesity* Prevalence, Youth 2 to 19 Years, US, 1976-2018



*Obesity: body mass index at or above 95th percentile cutoff points from CDC sex- and age-specific growth charts.

Source: National Health and Nutrition Examination Survey, see notes for citation.

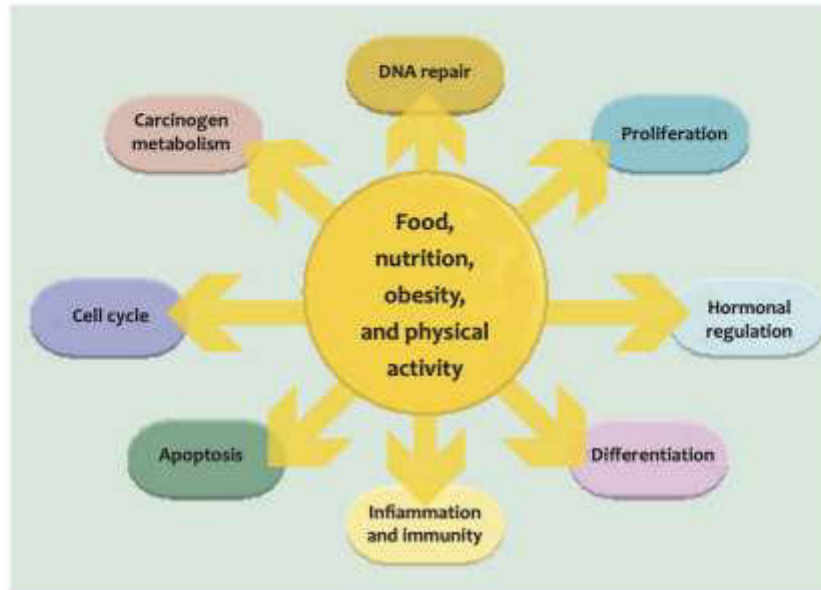


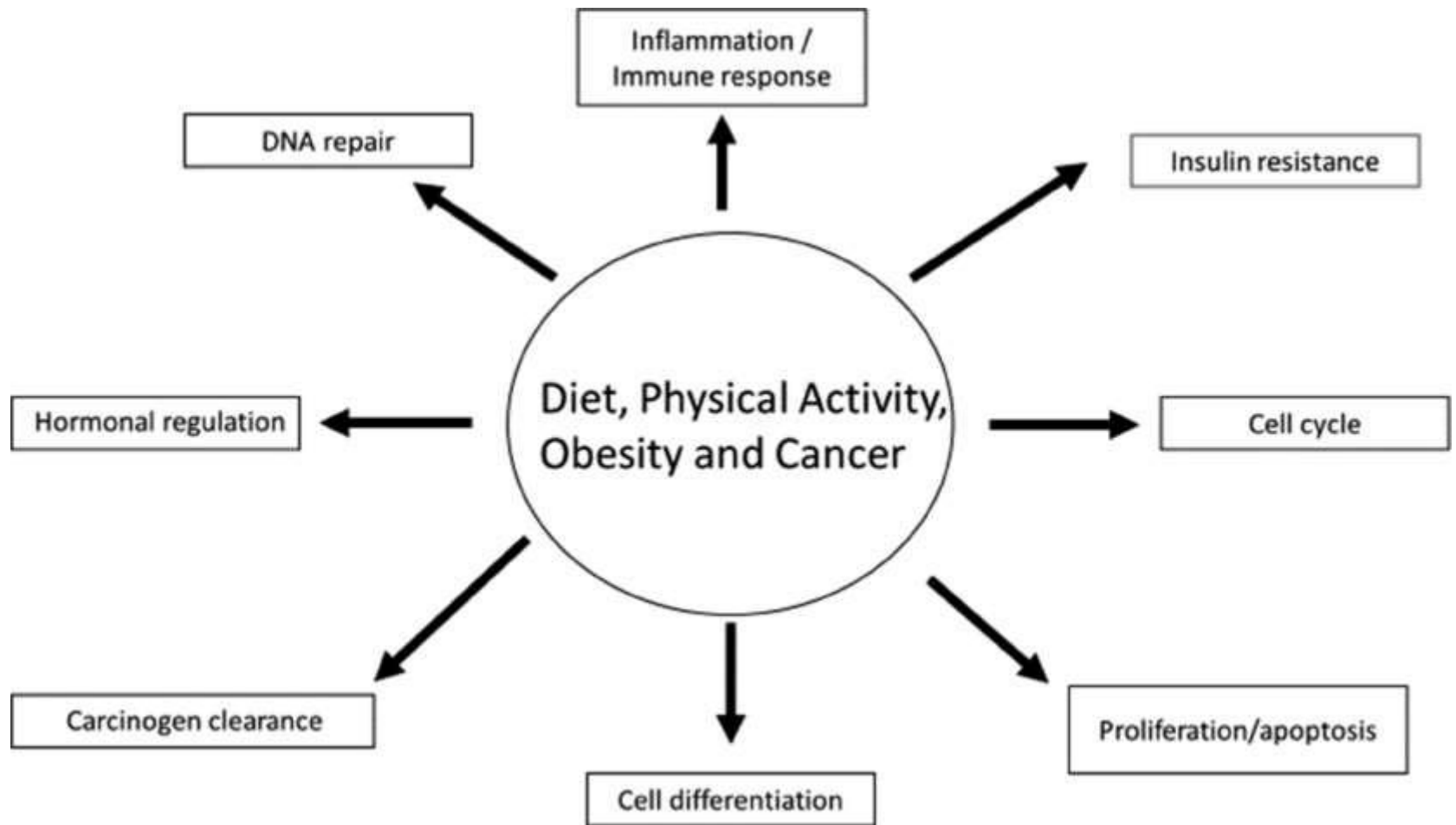
Figure 9 - Food, nutrition, obesity, and physical activity can influence fundamental processes shown here, which may promote or inhibit cancer development and progression

Source: World Cancer Research Fund & American Institute for Cancer Research

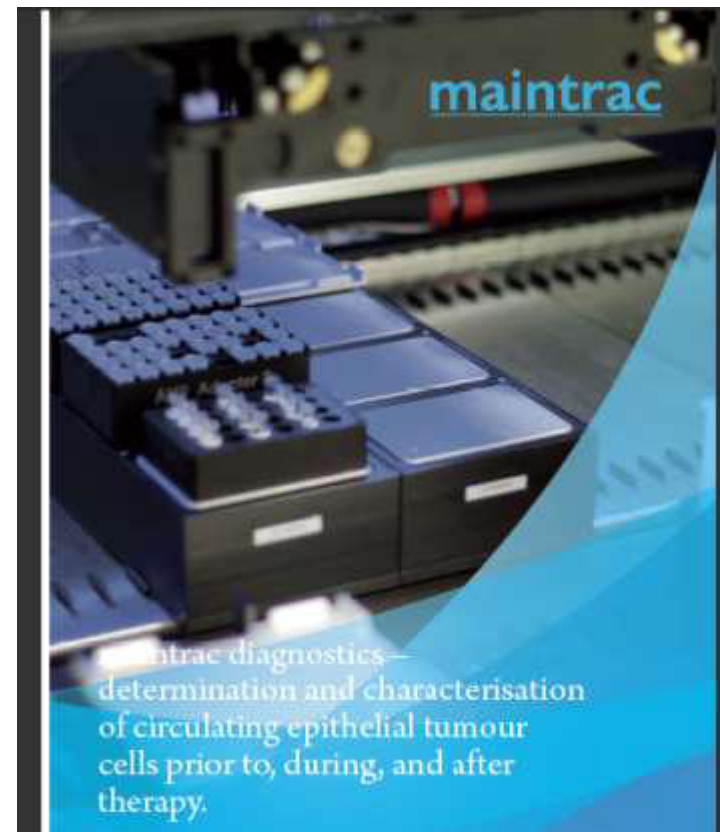
In particular:

A raised Body Mass Index (BMI) also increases the risk of cancer of the breast, colon/rectum, endometrium, kidney, oesophagus (Adenocarcinoma) and pancreas. Mortality rates increase with increasing degrees of overweight, as measured by BMI. To achieve optimal health, the

Am Soc Clin Oncol Educ Book
. 2018 May 23;38:88-100. doi:
10.1200/EDBK_200093



- Can Maintrac CTC Testing be used before diagnosis of cancer?

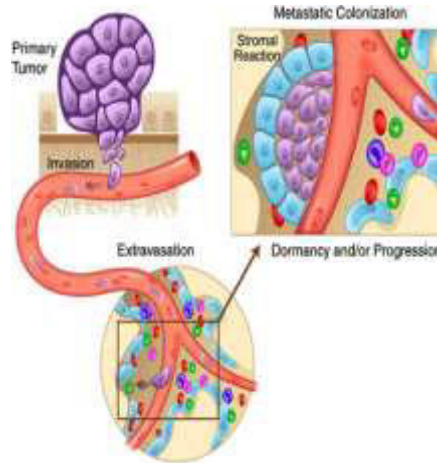


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Liquid Biopsy

- CTCs
- ctDNA or freeDNA
- Exosomes/vesicles
- RNA, mRNA
- Others

Circulating Tumor Cells from solid tumors

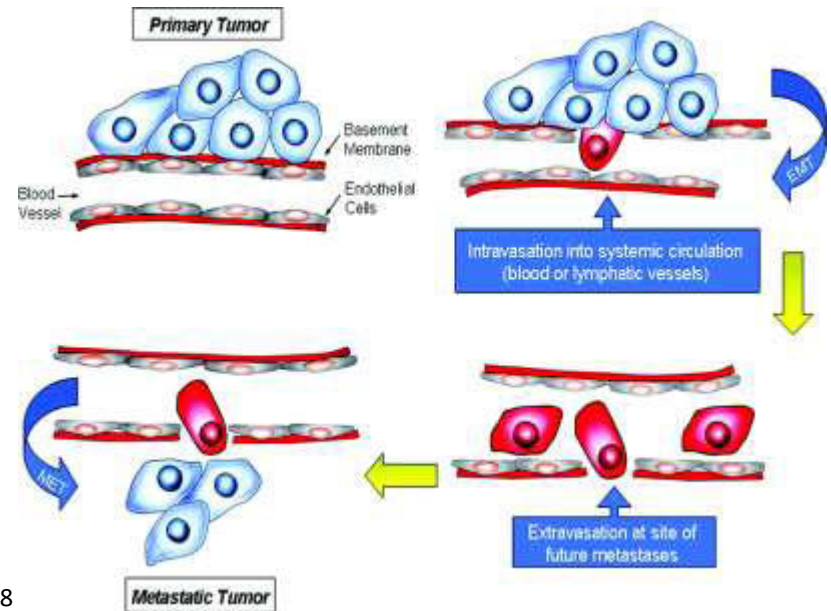


S Carcinomas are from **epithelial origin**

S Carcinomas **disseminate** epithelial cells

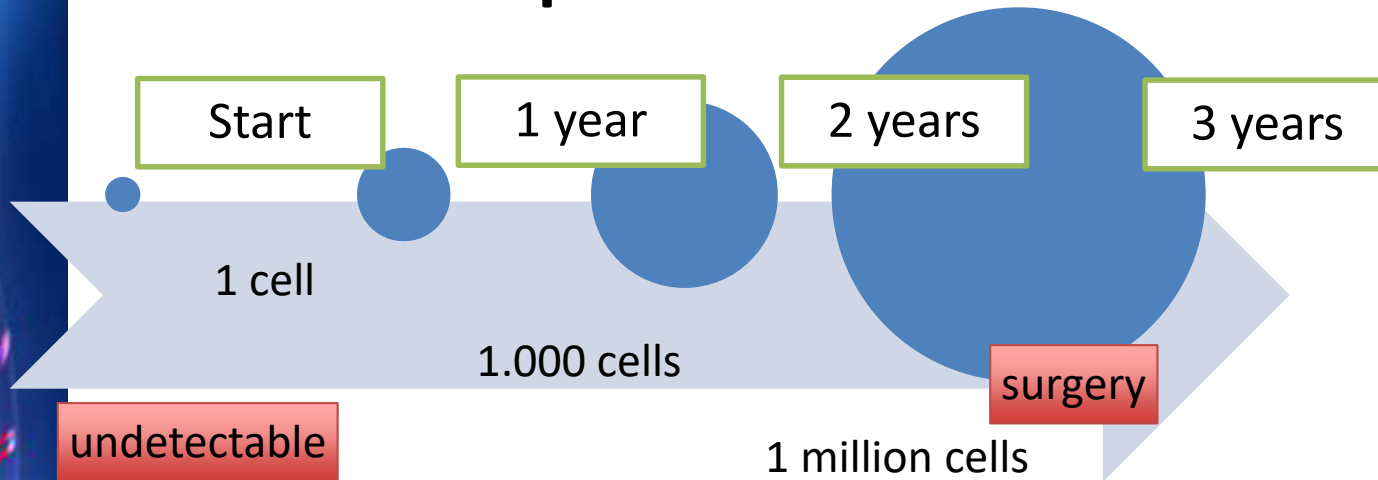
⇒ **CETCs**
(circulating **epithelial** tumor cells)

Y. Shiozawa, A M Havens, K J Pienta and R S Taichman, Leukemia (2008) 22, 941–950

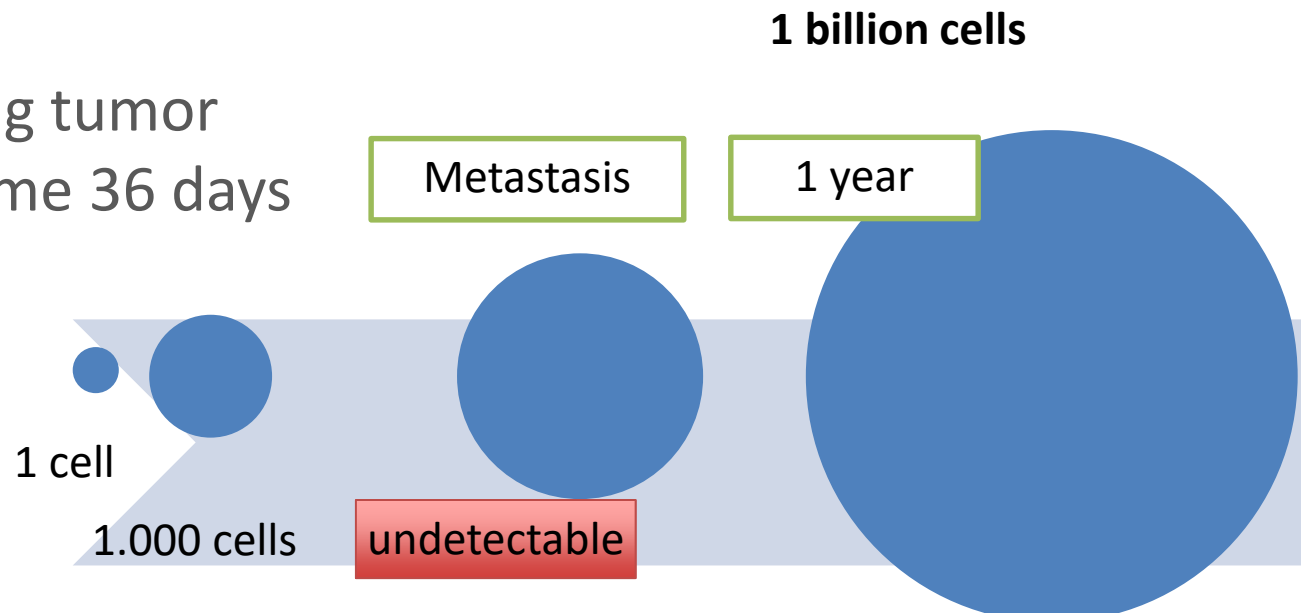


Dotan, E. et al. Oncologist 2009;14:1070-108

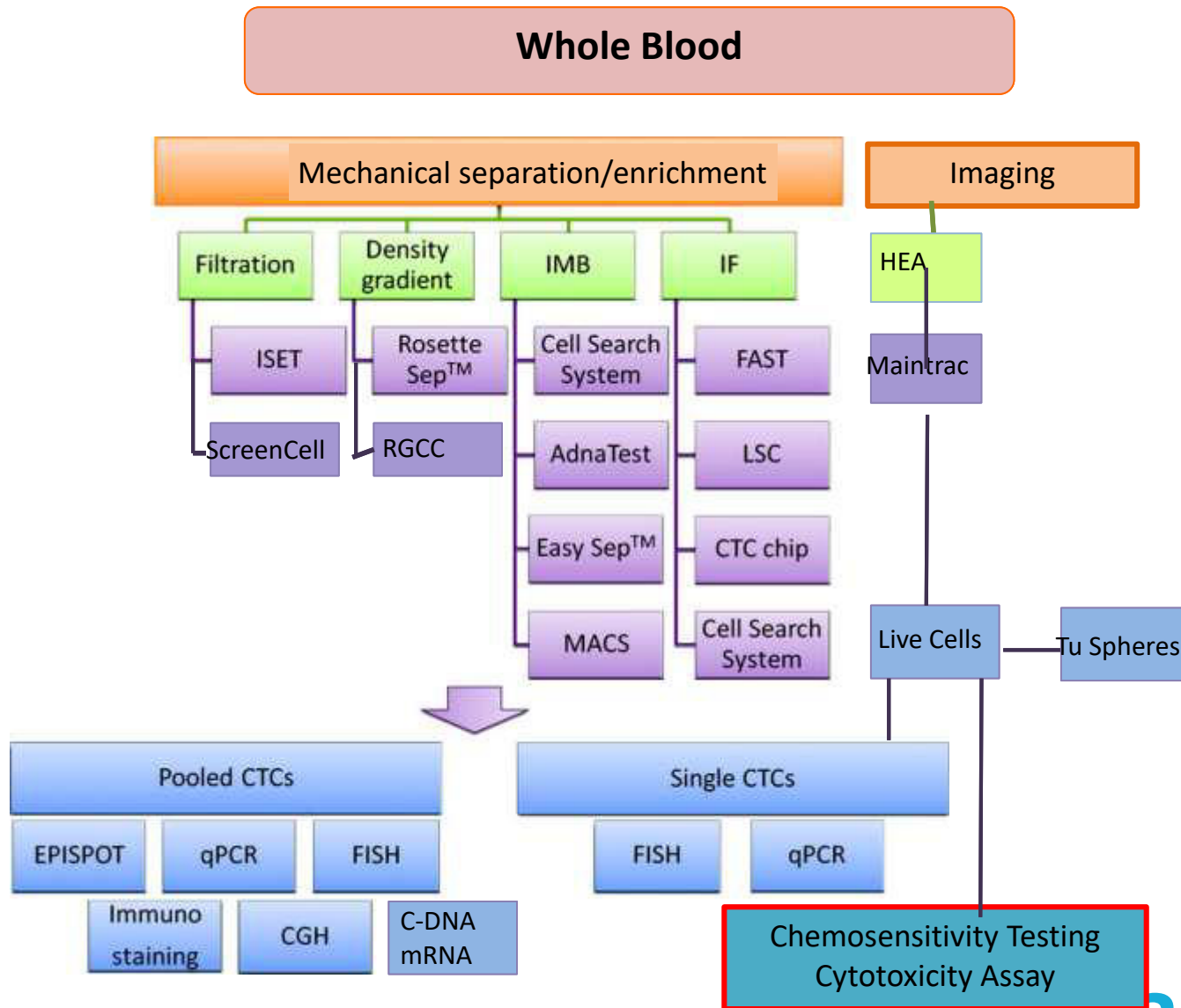
Development of solid tumors



Fast growing tumor
Doubling time 36 days



CTC Isolation



Method



1 ml
EDTA blood

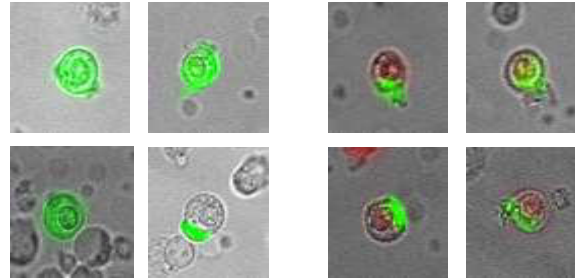


Red blood cell-
lysis



One centrifugation
step

+
Anti-EpCAM



- a) vital (EpCAM-positive and Propidium iodide) negative;
- b) dead (EpCAM-positive and Propidium iodide-positive) circulating epithelial tumor cells.



Fluorescence Laser Scanning
Microscope

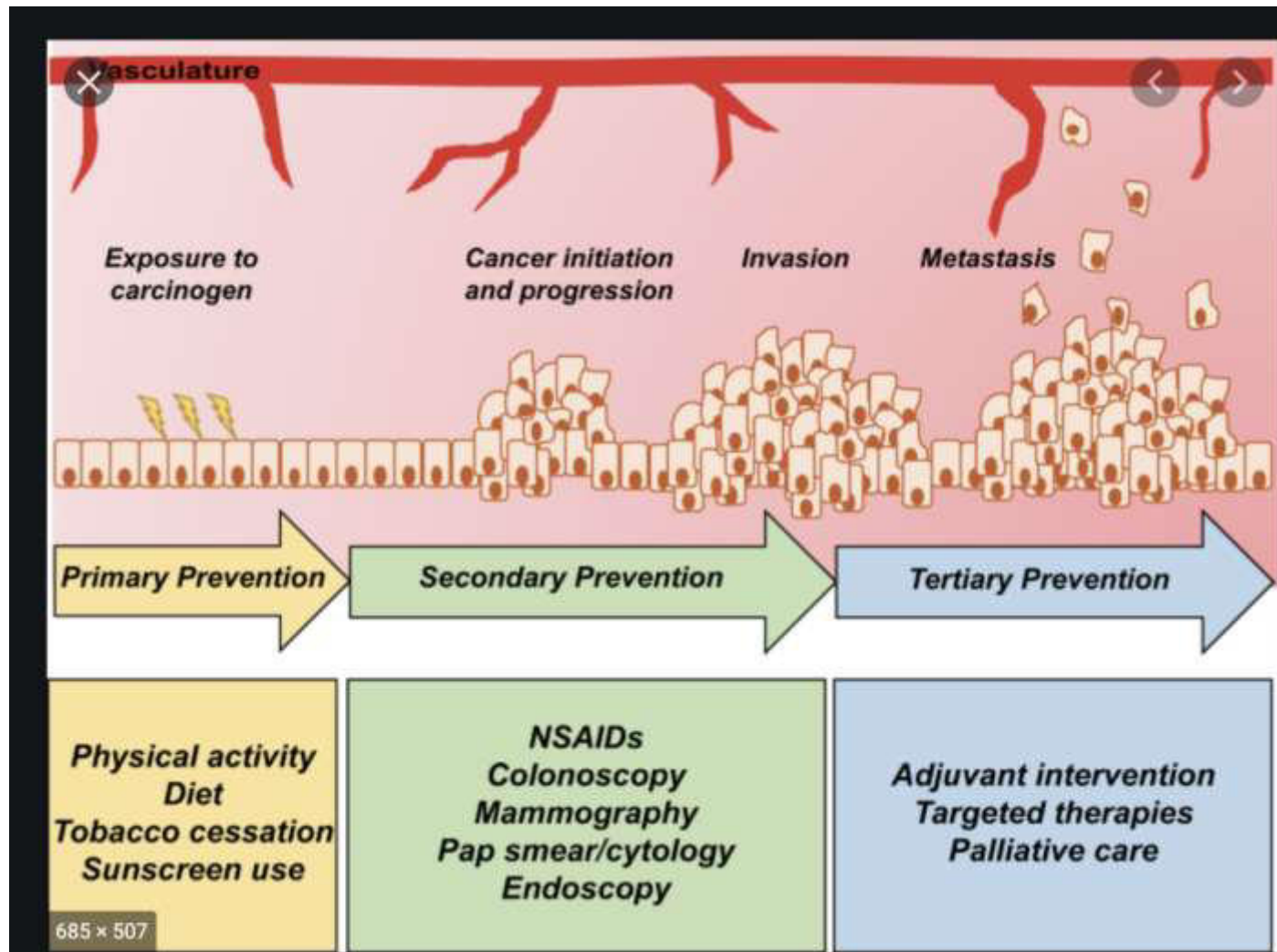
Test Results

Number of epithelial cell adhesion molecule (EpCAM)-positive cells				
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos cells	Cell fragments
EpCAM	0	0		no

Number of epithelial cell adhesion molecule (EpCAM)-positive cells				
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos cells	Cell fragments
EpCAM	700	3,5		numerous

2nd prevention

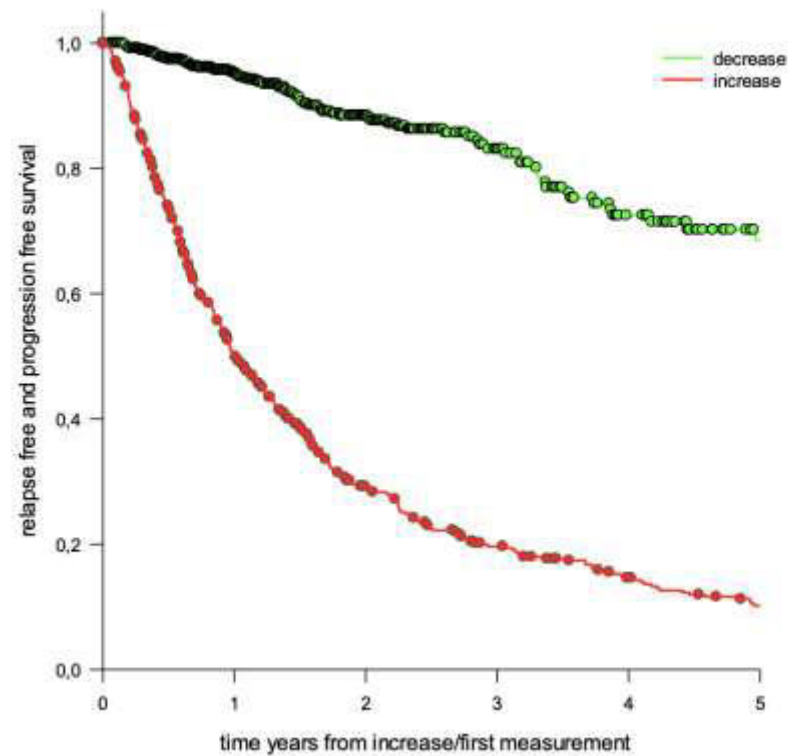
- Nutrition, Lifestyle
- Nutrient, Supplementation
- Decrease inflammation and clotting risk
- Meditation
- Testing and monitoring



Risk of Progression
Risk of Recurrence

CTCs as a monitor

relapse free and progression free survival analysis



Vitamin D

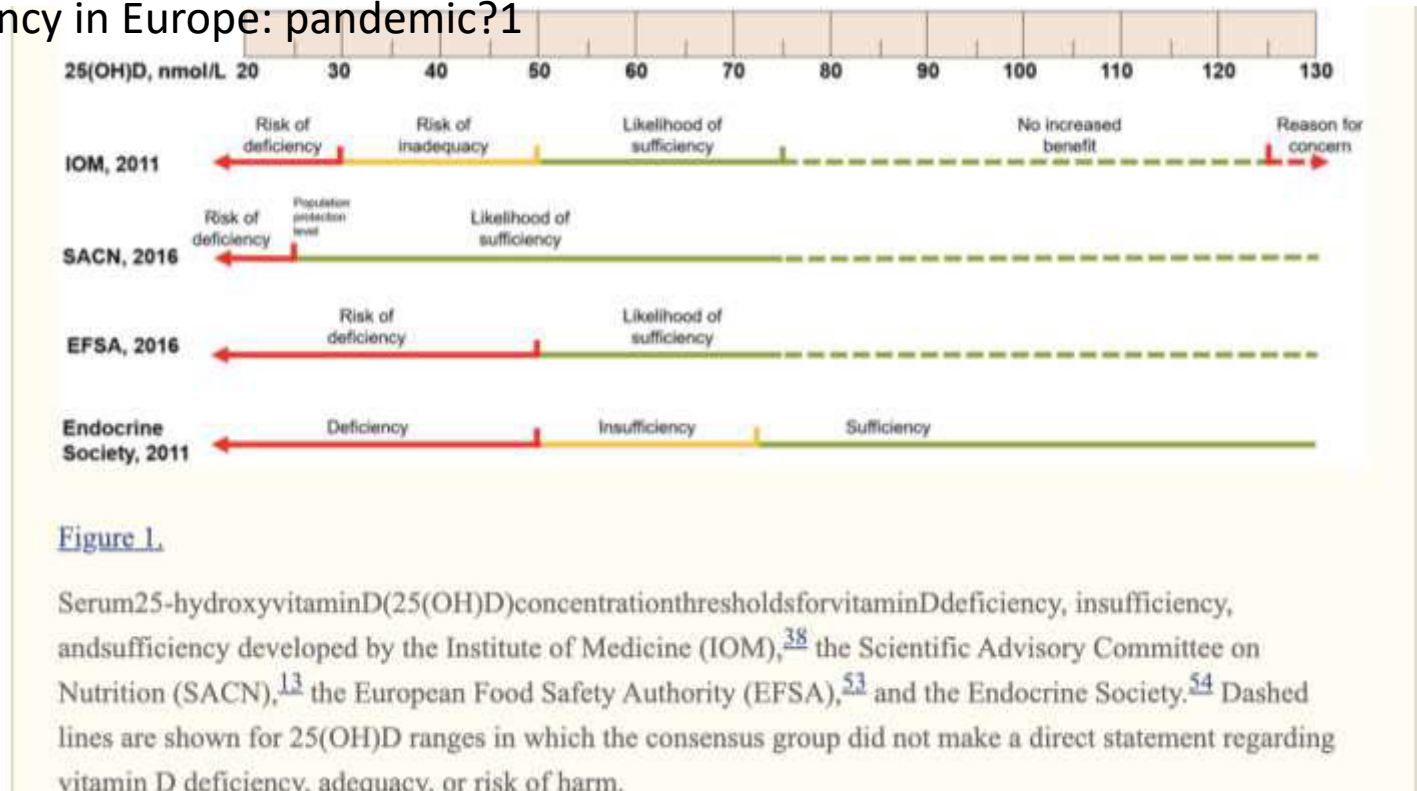
Am J Clin Nutr. 2016 Apr; 103(4): 1033–1044.

Published online 2016 Feb 10. doi: 10.3945/ajcn.115.120873

PMCID: PMC5527850

PMID: 26864360

Vitamin D deficiency in Europe: pandemic?1



Anticancer effect of Vitamin D

Asian J Androl. 2018

Cell cycle arrest with increased numbers of cells in G0/G1 and modulation of cyclin-dependent kinase (CDK) inhibitors, such as p21 and p27;6,7,8,9

Induction of apoptosis with poly (ADP-ribose) polymerase (PARP) cleavage, annexin binding, and increased bax/bcl-2 ratio;8,9,10,11,12,13

Suppression of the “pro-proliferative” signaling molecules such as phosphorylated mitogen-activated protein kinase (P-MAPK) (extracellular signal-regulated kinase [ERK] 1/2), phosphorylated-AKT (P-AKT), AKT, and MAPK/ERK kinase (MEKK)-1;10

Induction of caspase-dependent MAPK/ERK kinase (MEK)-cleavage;14,15

Induction of the p53 homolog p73;15

Inhibition of angiogenesis;16,17

Inhibition of motility and invasion;18,19

Induction of differentiation;5,20,21

Modulation of the expression of tumor-associated growth factors.22,23,24

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Vitamin D and Cancer

Review Article : Explore Vitamin D Metabolism and Cancer 2018

