Physical Activity and Nutrition

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Disclosures

- World Cancer Research Fund/American Institute for Cancer Research advisory panel 2010 – 2021
- Expert witness for litigations on carcinogens (including some in foods)
- Stock options for Benesol (light therapy devices for vitamin D deficiency)

2018 U.S. Physical Activity Guidelines Advisory Committee Report

- What is the relationship between physical activity and invasive cancer incidence?
- Among cancer survivors, what is the relationship between physical activity and: all cause mortality, cancer-specific mortality; risk of cancer recurrence or second primary cancer?
- Systematic literature search through 2016
- Published systematic reviews, meta-analyses, pooled analyses of epidemiologic cohort & case-control studies
- Evidence graded: strong, moderate, limited
- Most recent meta-analyses used for effect sizes
- https://health.gov/sites/default/files/2019-09/PAG_Advisory_Committee_Report.pdf

2018 U.S. Physical Activity Guidelines:
Cancer Risk High vs. Low Physical Activity: Meta-analyses

Cancer	Overall Evidence Grade	Relative Risk Reduction	Dose-response? Evidence Grade
Breast	Strong	12 – 21%	Yes, strong
Colon	Strong	19%	Yes, strong
Endometrium	Strong	20%	Yes, moderate
Esophagus (adenocarcinoma)	Strong	21%	No, limited
Stomach	Strong	19%	Yes, moderate
Bladder	Strong	15%	Yes, moderate
Kidney	Strong	12%	Yes, limited
Lung	Moderate	21 – 25%	Yes, limited
Hematologic, head, neck, ovary, pancreas, prostate	Limited	Varied	Varied
Brain	Not assignable	0	Not assignable
Thyroid, rectal	Limited	0	Not assignable

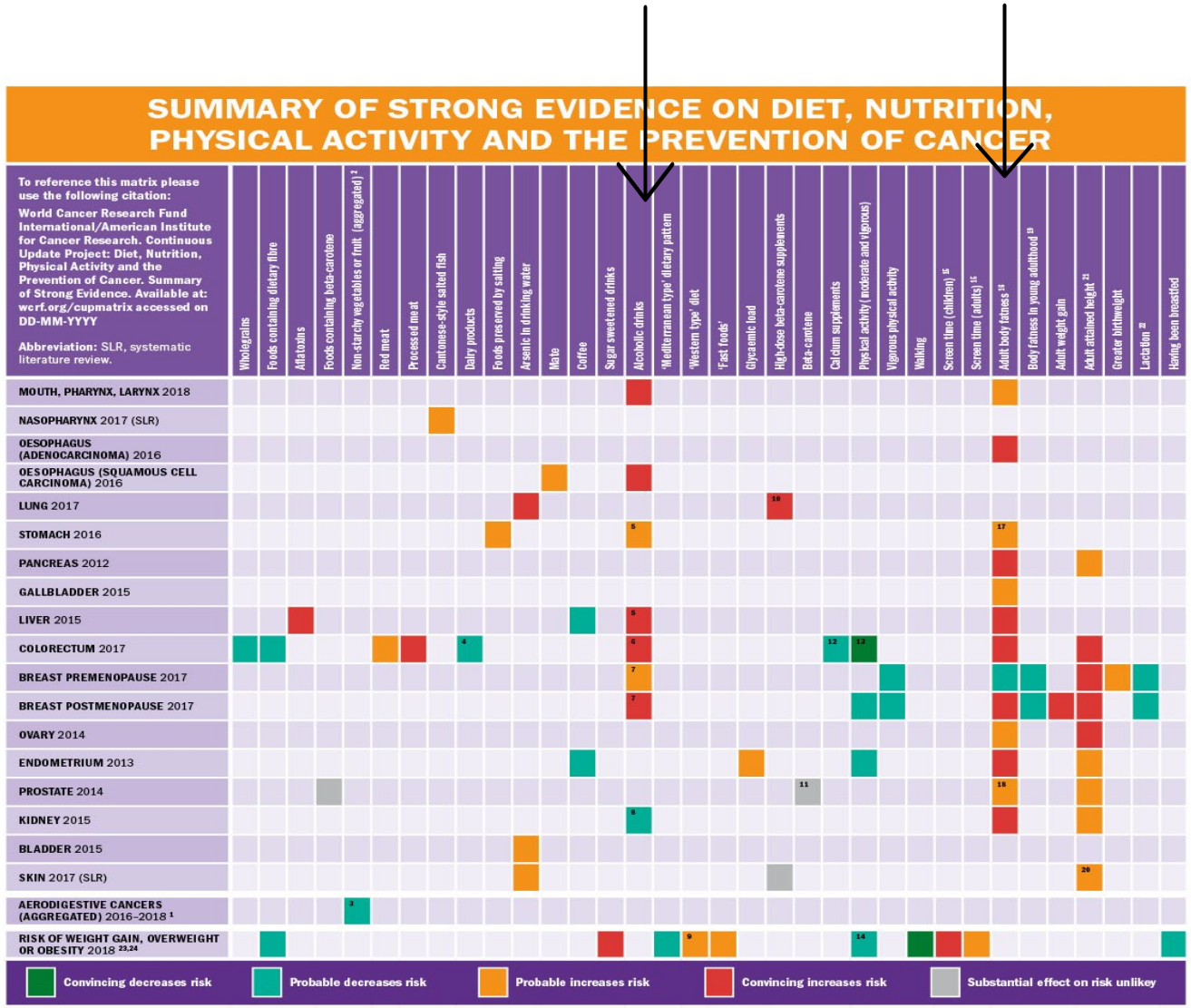
2018 U.S. Physical Activity Guidelines (including cancer risk reduction)

Age (years)	Aerobic Activity Recommendations	Muscle Strengthening Recommendations
6-17	60 minutes of moderate or vigorous physical activity/day, including at least 3 days of vigorous physical activity/week.	3 days/week and included as part of the 60 minutes of daily physical activity. Also include bone-loading activity.
18-64	150 -300 minutes of moderate physical activity/week, 75 minutes of vigorous physical activity/week or equivalent combination spread throughout the week.	Muscle strengthening activities at moderate or greater intensity (all major muscle groups) on 2 or more days/week.
65+	Same as younger adults, or be as active as abilities and health conditions allow.	Same as younger adults, but include balance training and combination activities (strength and aerobic training together).
All ages	Sit less. Move more. All physical activity counts.	

https://www.exerciseismedicine.org/
https://health.gov/our-work/nutrition-physical-activity/physical-activity-guidelines/current-guidelines

Does Increasing Physical Activity Reduce Cancer Risk?

- Few studies have looked at effect of uptake or increase in physical activity at different life periods on cancer risk
- Randomized controlled trials show reduction in cancer-related biomarkers in previously sedentary adults of different age groups



World Cancer Research Fund
American Institute for Cancer Research

dietandcancerreport.org

CUP Continuous Update Project
Analysing research on cancer prevention and survival

Does Weight Loss Reduce Cancer Risk?

- LookAhead lifestyle weight loss trial in persons with diabetes
  - 4859 without cancer randomized to intensive weight loss or control
  - Median follow-up 11 years
  - Pre-defined obesity-related cancers: esophagus, colon, rectum, kidney, pancreas, uterus, ovary, postmenopausal breast, stomach cardia, liver, gallbladder, meningioma, thyroid, multiple myeloma
  - 16% reduced risk of obesity-related cancers
  - Yeh et al. Obesity 2020;28(9):1678-86;Brown & McTiernan Obesity 2020;28(9):1575
- Bariatric Surgery matched cohort study
  - 5053 bariatric surgery; 25,265 matched non-surgical patients
  - Median follow-up 6.1 years
  - Pre-defined obesity-related cancers: esophagus adenocarcinoma, colon, rectum, kidney, pancreas, uterus, ovary, postmenopausal breast, stomach cardia, liver, gallbladder, thyroid, multiple myeloma
  - 32% decreased risk of obesity-related cancers
  - Aminian et al. JAMA 2022 (June 3 online)

Does Alcohol Reduction or Cessation Reduce Cancer Risk?

- Meta-analyses: cessation of alcohol intake reduces risk of cancers:
  - Head & neck
  - Liver
  - Esophagus
  - Stomach
- Few studies
- Risk estimates may reflect abstainers' history of high alcohol intake
- Reduction of risk may be small, occur over years/decades

Kiadaliri et al. PLOSOne 2013;8(3):e58158
Heckley et al. BMC Cancer 2011; 11:446
Jarl et al. Addition 2012; Jul;107(7):1234
Jarl et al. BMC Public Health 2013; 13:600

Implementing in Clinic (all ages)

- Patient access to primary care (or survivorship care)
- Clinician time, institutional priorities
- Electronic Health Record: availability, error
  - Physical Activity Vital Sign (e.g., American College of Sports Medicine)
    - Kuntz et al. Am J Prev Med 2021 Jun;60(6):866-872
  - Body Mass Index
  - Diet?
  - Alcohol use
- Integration with recommendations for prevention of other common chronic diseases (e.g., cardiovascular, diabetes, etc.)
- Patient handouts (electronic, paper), clinician referrals

Clinical Tools

- American College of Sports Medicine:
  - Physical activity vital sign
  - Guidance for exercise prescription
  - Resources for providers and patients
  - https://www.exerciseismedicine.org/
- Weight loss programs
  - CDC Diabetes Prevention Program https://dprp.cdc.gov/Registry
  - YMCA Diabetes Prevention Program
  - Commercial weight loss programs
  - Medications (none approved for cancer prevention)
  - Bariatric surgery

Cancer Survivors

- January 2019: 19.9 million people living with cancer in U.S.
  - https://cancercontrol.cancer.gov/ocs/statistics
- Increased risk for new cancer
  - https://www.cancer.org/research/cancer-facts-statistics/survivor-facts-figures.html
- American Society for Clinical Oncology guidelines
  - Obesity in cancer survivors: Ligibel et al, JCO 2014 Nov 1;32(31):3568-74
  - Physical activity, diet during treatment: Ligibel et al, JCO 2022 May 16 online
- American Cancer Society
  - Nutrition & physical activity guidelines for survivors: CA Cancer J Clin. 2022 May;72(3):230-262

Open Questions

- Can clinic-based interventions reduce cancer risk: physical activity, nutrition, weight loss, alcohol reduction?
- What are effective interventions for specific groups: age, gender, race/ethnicity, diverse incomes, rural dwellers, persons at elevated cancer risk, cancer survivors?
- What is the feasibility in different primary care settings?
- What is the efficacy of guidance in virtual visits, group clinics (in person or virtual), electronic health monitoring, electronic health record?