Diet and Exercise: Why and How?

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Disclosure Sample Slide – No Conflicts

- No conflicts to disclose
Guideline-specific vs. Non-guideline specific options

- Our attendees at past conferences have indicated confusion regarding conflicting medical information. This year we are asking speakers (if possible and where applicable) to include one of the following icons on any slides or bullets that are guideline-recommended actions.

- Please use either of the following graphics as appropriate to indicate when a point you are making is according to national guidelines (you should be able to copy and paste the image onto your slide). For options that are not necessarily guideline driven and/or those that lack evidence to be included into guidelines, please just state that (if possible) during your presentation.
OUTLINE

- Cancer Prevention Continuum
- Why Exercise and Nutrition?
- Exercise, Physical Activity and Sitting Time
- Nutrition and Diets
- Wellness...Bringing it all together
Cancer Prevention Continuum

Disease Initiation → "Healthy" → High-Risk → Progression to Disease → Progression/Comorbidities Retention of Quality of Life

Progression/Recurrence Retention of Quality of Life → Stage I-III → Survivor → Recurrence/Comorbidities Retention of Quality of Life → Metastatic

Retention of Quality of Life → Progression to Disease → Recurrence/Comorbidities Retention of Quality of Life
Why Exercise And Nutrition?
Remember Smoking???
Our New Public Health Threat

Adult Obesity Rate by State, 2016

Select years with the slider to see historical data. Hover over states for more information. Click a state to lock the selection. Click again to unlock.

Percent of obese adults (Body Mass Index of 30+)

0 - 9.9% 10 - 14.9% 15 - 19.9% 20 - 24.9% 25 - 29.9% 30 - 34.9% 35%+

Map showing obesity rates by state.
Energy Balance

Balanced Weight

Weight Loss

Weight Gain
Lack of Energy Balance

Portions Are UP

Activity Is DOWN

We Are Headed Here
Obesity and Risk of Cancer

Does this apply to individuals at high-risk of cancer?

YES

Most recently...
Obesity was shown to be associated with increased DNA damage in breast cells of BRCA mutation carriers

**Bhardwaj et. al., Endocrine Society Meeting abstract, March 2018, Chicago**
Obesity and Risk of Cancer

AICR estimates that excess body fat is a cause of approximately 132,800 U.S. cancer cases every year.

And yet... 7 in 10 Americans are currently overweight or obese.

And... Only about half of all Americans are even aware of the obesity-cancer link.

Protect yourself!

Move More
Eat Smart

For tips on getting to, and staying at, a healthy weight, visit www.aicr.org

However...not routinely addressed in genetic counseling sessions
Obesity and Cancer Outcomes

Cancer Recurrence
Death
Comorbidities

Quality of Life
Treatment Effectiveness
Treatment-related Symptoms

Percentage of cancer survivors aged 20 years and older who were obese, Both Sexes, 1992-2016

- Obesity is defined as a Body Mass Index (BMI) greater than 30.
- HP 2020 Target NW-9: 30.5%

Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Health Interview Survey.


Weighted regression lines are calculated using the Joinpoint Regression Program, Version 4.3.1.8 April 2015, National Cancer Institute.

The AAPC is the Average Annual Percent Change and is based on the APCs calculated by Joinpoint.
* The Annual Percent Change (APC) Average Annual Percent Change (AAPC) is statistically significant.
Why Exercise and Nutrition?
OUTLINE

- Cancer Prevention Continuum
- Why Exercise and Nutrition?
- Exercise, Physical Activity and Sitting Time
- Nutrition and Diets
- Participating in Research
- Wellness...Bringing it all together
Physical Activity vs Exercise

**Physical Activity:** any movement of the body that is carried out by the muscles and requires energy

**Exercise:** a planned, structured, repetitive movement designed specifically to improve or maintain physical fitness
## Moderate vs Vigorous Intensity

<table>
<thead>
<tr>
<th>Moderate Intensity</th>
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</thead>
<tbody>
<tr>
<td>• Walking briskly (3 miles per hour or faster, but not race-walking)</td>
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<tr>
<td>• Water aerobics</td>
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<tr>
<td>• Bicycling slower than 10 miles per hour</td>
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<tr>
<td>• Tennis (doubles)</td>
</tr>
<tr>
<td>• Ballroom dancing</td>
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<tr>
<td>• General gardening</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Vigorous Intensity</th>
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<tbody>
<tr>
<td>• Race walking, jogging, or running</td>
</tr>
<tr>
<td>• Swimming laps</td>
</tr>
<tr>
<td>• Tennis (singles)</td>
</tr>
<tr>
<td>• Aerobic dancing</td>
</tr>
<tr>
<td>• Bicycling 10 miles per hour or faster</td>
</tr>
<tr>
<td>• Jumping rope</td>
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<tr>
<td>• Heavy gardening (continuous digging or hoeing)</td>
</tr>
<tr>
<td>• Hiking uphill or with a heavy backpack</td>
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</tbody>
</table>

**Talk test**

- **Moderate**: You can talk, but not sing, during the activity
- **Vigorous**: You will not be able to say more than a few words without pausing for a breath
Benefits of Exercise and Physical Activity

- Diabetes & Heart Disease
- Body Weight
- Excess Estrogen from Fat Tissue
- Cancer Risk
- Quality of Life
- Depression & Anxiety
- Inflammation
- Pain & Fatigue
- Fatigue
Exercise, Physical Activity and Cancer Risk

Make Time for Break Time

This graphic illustrates how different amounts of activity influence certain much-studied indicators of cancer risk. Other factors like eating smart, staying lean and not smoking also may lower cancer risk.

Types of activity: Moderate/Vigorous, Break, Sedentary

Daily Activity

Cancer Risk

Exercise, Physical Activity, Sitting Time

http://www.aicr.org/assets/docs/pdf/education/Make-Time-Break-Time-Infographic-FINAL.pdf
Epidemiologic Evidence

THERE IS A STRONG ASSOCIATION

between physical activity and a decreased risk of these cancers:
- Breast
- Colorectal
- Endometrial

between sedentary behavior and an increased risk of these cancers:
- Postmenopausal

Recently...
A reduction in breast cancer risk was observed among BRCA1/2 carriers who exercised regularly, mainly during the adolescence

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Risk of Breast Cancer by 20-40%
Risk of Colon Cancer by at least 20%
Risk of Endometrial Cancer by 20-30%
Risk of Other Cancers

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***Pollan et. al., 10.1200/JCO.2017.35.15_suppl.1505 Journal of Clinical Oncology 35, no. 15_suppl (May 20 2017) 1505-1505
Exercise Prescription for Cancer Risk Reduction?

- Dose?
- Type?
- Duration?
- Frequency?

Effect of Exercise on Cancer Biology
Exercise, Physical Activity and Cancer Risk

**BIOLOGICAL MECHANISMS**
- Hormonal pathways
- Inflammatory pathways
- Immune-related pathways
- Metabolic pathways
- Physiologic changes

**My research areas:**
- Inflammation
- DNA repair
- Telomeres
- Metabolism
- RNA sequencing
- Genetic predisposition
- Molecular changes
- Cell signaling alterations
- Microenvironment changes
- Epigenetic changes
- Omics
Cancer Risk Reduction Recommendations

**Adults:**
- Get at least 150 minutes of moderate intensity and 75 minutes of vigorous intensity activity each week (or a combination of these).
- Preferably spread throughout the week.
- At least 10 minutes at a time.

**Children and teens:**
- Get at least 1 hour of moderate or vigorous intensity activity each day.
- With vigorous activity on at least 3 days each week.

**Everyone:**
- LIMIT SEDENTARY BEHAVIOR such as sitting, lying down, watching TV, and other forms of screen-based entertainment.

*Based on recent research...adolescence seems to be a very important window for physical activity in high-risk individuals.*
Exercise and Cancer Outcomes

Cancer Recurrence → Death → Comorbidities

Only 30% of cancer survivors are meeting physical activity recommendations

Quality of Life

Treatment Effectiveness → Treatment-related Symptoms
Myth Busters

Exercise is not safe during cancer treatment

Being physically active is highly recommended during treatment

Patients shouldn't worry about exercising after being diagnosed with metastasis

Exercise decreases negative side effects and increases quality of life

Exercise exacerbates symptoms of treatment

Decreases fatigue, depression, anxiety, nausea, pain...

Patients should not continue their same level of activity

Activity should be a consistent yet dynamic component care

Patients cannot stop once they start exercising

Breaks are okay...flexibility based on tolerance

Exercise doesn't make a difference after diagnoses or treatment

Exercise increases TX effectiveness and quality of life, decreases risk of recurrence, progression, mortality and morbidity
Cancer Outcome Recommendations

**During Treatment**
- Stay as active as possible
  - Will ebb and flow
  - Take your time
  - Consider side-effects and timing
  - Set attainable goals
- Precautions to prevent falls and infections
- Post-surgery precautions
- Aerobic and strength training
- Try for 30 minutes each day
- Consider physical and/occupational therapy

**Post-Treatment**
- Stay as active as possible
- Precautions to prevent falls
- Post-surgery precautions
- **AEROBIC:** 150 minutes (2½ hours) of moderate activity OR 75 minutes (1¼ hours) of vigorous activity per week
- **STRENGTH:** 2 days per week
- At least 10 minutes at a time
- Spread out throughout the week
- Increase activity

Pre-Habilitation
Current Research

To identify and develop exercise interventions that not only elicit biological changes effective in reducing risk but also are feasible for the average person to implement and maintain.
DO YOU WANNA
DO A WORKOUT?

CUE + ROUTINE + REWARD = HABIT

start small
but start
How Much Now?
What is Your Goal?

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Strategies?
Get Up & Move!
OUTLINE

- Cancer Prevention Continuum
- Why Exercise and Nutrition?
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- Nutrition and Diets
- Wellness...Bringing it all together
Nutrition vs Diet

Nutrition: refers to the act or process of nourishing or being nourished…getting appropriate amount of nutrients including protein, fat, carbohydrates, vitamins, minerals and water to survive

Diet: refers to the food and drinks one regularly consumes

Dieting: refers to restricting oneself to a “diet” comprised of specific amounts and/or special types of food to lose weight
Popular Diets...
Nutrition and Cancer Risk

Any nutrition or diet program is safe and effective at lowering cancer risk and recurrence as long as it results in weight loss

FALSE

Consume a nutritious diet, with an emphasis on plant foods:
- Choose foods and beverages in amounts that help achieve and maintain a healthy weight
- Limit consumption of processed meats and red meats
- Eat at least 2 ½ cups of vegetables and fruits each day
- Choose whole grains instead of refined-grain products

MODERATION!

Based on recent research...

Among BRCA mutation carriers, variety, including vegetable variety, and general guidelines are associated with a decrease risk of cancer.
Nutrition and Cancer Outcomes

Consume a nutritious diet, with an emphasis on plant foods:

• Choose foods and beverages in amounts that help achieve and maintain a healthy weight
• Limit consumption of processed meats and red meats
• Eat at least 2 ½ cups of vegetables and fruits each day
• Choose whole grains instead of refined-grain products

Special diets:

• Vegetarian or vegan:
  • No substantial evidence suggesting a benefit to adopting a vegetarian or vegan diet upon diagnosis
  • No evidence to show that one should stop a vegetarian or vegan diet

• Ketogenic:
  • Studies in glioblastoma ongoing
  • Recent research observing differing affects on tumor cells based on specific mutations

***Weight gain and inability to lose weight...
<table>
<thead>
<tr>
<th>Date ____________________________</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td><strong>Meal</strong></td>
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<tr>
<td>Breakfast</td>
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<td>Snack</td>
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<tr>
<td>Lunch</td>
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<tr>
<td>Snack</td>
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<tr>
<td>Dinner</td>
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</tbody>
</table>

Write it Down!
Alcohol...

Drinking is okay...BUT...how much is too much???

• If you drink alcohol, limit your consumption
  • No more than 1 drink per day for women
  • No more than 2 drinks per day for men

• A drink =
  • Wine or beer or hard liquor
  • Anything with alcohol in it

• One drink =
  • 12 ounces of run of the mill beer (5% alcohol)
  • 5 ounces of wine (12% alcohol)
  • 1.5 ounces of 80 proof liquor (40% alcohol)

• Be aware of over pouring

• If you do not drink...do not start
Alcohol...

IPA: 9% alcohol
12 ounces = 1.8 drinks

Double IPA: 14% alcohol
12 ounces = 2.8 drinks

Typical Margarita = 1.8 drinks
Cadillac Margarita = 2.7 drinks

https://RETHINKING DRINKING NIAAA WEBSITE
How Do You Eat Now?
What Would You Like to Improve?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Obstacles?
Strategies?
Moderation & Mindfullness
OUTLINE

- Cancer Prevention Continuum
- Why Exercise and Nutrition?
- Exercise, Physical Activity and Sitting Time
- Nutrition and Diets
- Wellness...Bringing it all together
Bringing it All Together: Wellness

Movement, Moderation & Mindfulness
Remember Smoking?

Time for Translation!
Thank You

City of Hope
- Population Sciences
- Medical Oncology
- Breast Surgeons
- Integrative Genomics
- Analytical Pharmacology Core
- Clinical Cancer Genetics

UCSF
Curves, Zumba, Crossfit, Garmin
The Claremont Club
Patients and Families

Funders:
- Kindness Grant, City of Hope
- Women’s Cancers Program, City of Hope
- Circle 1500, City of Hope