HOPE GROWS
Garden-based interventions improve physical & mental health of cancer survivors

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Cancer Continuum

• >60% OW or OB
• Vulnerable
• Teachable moment
• Prevalence rising
Prevalence of Cancer Survivors

What We Know
The Causes of Cancer

Environment 90-95%
Genes 5-10%

Diet 30-35%
Obesity 10-20%
Tobacco 25-30%
Infections 15-20%
Other 10-15%
Alcohol 4-6%

Estimated Number of Cancer Survivors in the US

Projected numbers from 2010 to 2020.
“Food intake is the environmental factor to which we are ALL exposed necessarily and permanently from conception to death.”

Ordovas, 2008

<table>
<thead>
<tr>
<th>Evidence-Based Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DGA (Clinton)</strong></td>
</tr>
<tr>
<td><strong>Body Weight</strong></td>
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<tr>
<td><strong>Physical Activity</strong></td>
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<tr>
<td><strong>Produce</strong></td>
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<tr>
<td><strong>Meat</strong></td>
</tr>
<tr>
<td><strong>Sugar &amp; Energy Dense Foods</strong></td>
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<tr>
<td><strong>Supplements</strong></td>
</tr>
</tbody>
</table>
U.S. Dietary Patterns

Average intake >2,500 kcal/d

Fats & oils >450 kcal/d

Annual consumption/person:
- 23# cheese
- 109# of flour
- 78# of sugar

Higher FV consumption associated with reduced risk of all-cause mortality

Dose matters
Each additional serving (up to 5) associated with 5% risk reduction
Phytochemicals Fight Cancer

Growing Hope

- Goal: Improve health outcomes
- Biobehavioral intervention
  - Harvesting produce
  - Group education/cooking demos
  - Remote coaching
  - Technology
- Enriched & supportive environment

Physical Activity and Body Weight

~20% increase in physical activity

Clinically significant weight loss
## Clinical Outcomes

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline Mean (SD)</th>
<th>Post Intervention Mean (SD)</th>
<th>Difference (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>85.28 (16.21)</td>
<td>81.40 (16.68)</td>
<td>-3.88 (-5.61, -2.15)</td>
<td>&lt; .001*</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>31.85 (5.13)</td>
<td>30.40 (5.33)</td>
<td>-1.46 (-2.09, -0.82)</td>
<td>&lt; .001*</td>
</tr>
<tr>
<td>Waist circumference (cm)</td>
<td>102.03 (13.59)</td>
<td>96.53 (13.56)</td>
<td>-5.50 (-6.90, -4.11)</td>
<td>&lt; .001*</td>
</tr>
<tr>
<td>Physical activity (steps/d)</td>
<td>6,560 (3,420)</td>
<td>7,768 (3,523)</td>
<td>1,208 (104.49, 2,313.02)</td>
<td>0.033*</td>
</tr>
<tr>
<td>Quality of life (score)</td>
<td>268.72 (51.23)</td>
<td>285.24 (52.16)</td>
<td>16.52 (5.78, 27.26)</td>
<td>0.004*</td>
</tr>
<tr>
<td>Systolic BP (mmHg)</td>
<td>127.66 (15.82)</td>
<td>118.14 (12.99)</td>
<td>-9.52 (-16.02, -3.02)</td>
<td>0.006*</td>
</tr>
<tr>
<td>Diastolic BP (mmHg)</td>
<td>75.03 (8.27)</td>
<td>73.21 (7.97)</td>
<td>-1.83 (-4.66, 1.00)</td>
<td>0.197</td>
</tr>
<tr>
<td>Total cholesterol (mg/dL)</td>
<td>190.41 (29.49)</td>
<td>179.21 (32.20)</td>
<td>0.94 (0.90, 0.98)</td>
<td>0.004*</td>
</tr>
<tr>
<td>HDL (mg/dL)²</td>
<td>54.90 (13.34)</td>
<td>53.41 (13.04)</td>
<td>0.97 (0.92, 1.03)</td>
<td>0.275</td>
</tr>
<tr>
<td>LDL (mg/dL)²</td>
<td>113.45 (28.60)</td>
<td>107.72 (28.99)</td>
<td>0.93 (0.89, 1.00)</td>
<td>0.051*</td>
</tr>
<tr>
<td>Triglycerides (mg/dL)</td>
<td>133.21 (52.72)</td>
<td>113.10 (44.36)</td>
<td>0.86 (0.76, 0.96)</td>
<td>0.010*</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>5.68 (0.53)</td>
<td>5.70 (0.45)</td>
<td>0.02 (-0.25, 0.30)</td>
<td>0.879</td>
</tr>
<tr>
<td>hs-CRP (gm/L)</td>
<td>3.96 (4.21)</td>
<td>3.25 (4.07)</td>
<td>0.72 (0.58, 0.89)</td>
<td>0.004*</td>
</tr>
<tr>
<td>IgfBP3 (µg/mL)³</td>
<td>4.74 (0.87)</td>
<td>4.50 (0.84)</td>
<td>0.95 (0.91, 0.98)</td>
<td>0.005*</td>
</tr>
<tr>
<td>Igf-1 (ng/mL)³</td>
<td>95.59 (34.11)</td>
<td>104.45 (40.13)</td>
<td>1.07 (0.86, 1.33)</td>
<td>0.553</td>
</tr>
<tr>
<td>Skin carotenoids (RSS)</td>
<td>29509 (11471)</td>
<td>33963 (14441)</td>
<td>4455 (944.42, 7964.61)</td>
<td>0.0157*</td>
</tr>
<tr>
<td>Plasma carotenoids (umol/L)⁴</td>
<td>1749.51 (871.74)</td>
<td>2330.04 (1220.81)</td>
<td>1.35 (1.15, 1.58)</td>
<td>&lt; .001*</td>
</tr>
</tbody>
</table>

Log transformed; *difference expressed as fold change; *p<0.05
# Quality of Life

<table>
<thead>
<tr>
<th>QOL Item (N=29)</th>
<th>Baseline Mean (SD)</th>
<th>Post-Intervention Mean (SD)</th>
<th>Difference (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Life (Total Score)*</td>
<td>268.86 (51.24)</td>
<td>284.93 (51.75)</td>
<td>+16.07 (5.51, 26.62)</td>
<td><strong>0.004</strong>*</td>
</tr>
<tr>
<td>Physical Well Being</td>
<td>Fatigue</td>
<td>5.59 (2.64)</td>
<td>6.52 (2.72)</td>
<td>+0.93 (0.01, 1.86)</td>
</tr>
<tr>
<td>Psychological Well Being</td>
<td>How good is your quality of life?</td>
<td>7.17 (2.27)</td>
<td>8.28 (1.22)</td>
<td>+1.11 (0.18, 2.03)</td>
</tr>
<tr>
<td></td>
<td>How useful do you feel?</td>
<td>7.21 (2.14)</td>
<td>7.76 (1.81)</td>
<td>+0.55 (0.06, 1.05)</td>
</tr>
<tr>
<td>Spiritual Well Being</td>
<td>How hopeful do you feel?</td>
<td>7.69 (1.61)</td>
<td>8.28 (1.69)</td>
<td>+0.59 (0.15, 1.02)</td>
</tr>
<tr>
<td></td>
<td>To what extent has your illness made positive changes in your life?</td>
<td>5.72 (2.76)</td>
<td>6.48 (2.68)</td>
<td>+0.76 (0.06, 1.45)</td>
</tr>
</tbody>
</table>

*Quality of Life Patient/Cancer Survivor Version (QOL-CSV)  

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# Growing Healthy Kids

- **2016 Summer Feeding Program**
- **Collaboration: OSU + NCH + BGSU**
GHK Results

- Feasible and acceptable
- Improved FV intake & PA
- Increased adventurous eating
- Healthier snacks
- Improved child/PAC interactions

Harvesting Health 4 Kids

- 2017 Survivors of youth cancer
- Results
  - Acceptability and feasibility
  - Significant improvements
    - QOL
    - Parenting behaviors
    - Mealtime interactions
- https://www.facebook.com/osu/videos/10156719720583858/
What’s Next?

- Current Research
  - Obesity Prevention (USDA)
  - Adult Dietary Patterns
- Future Research
  - Youth Survivors
  - Caregivers
  - Mental & Spiritual Health
  - Home Gardening
- Keep Advocating!

It Takes a Village!

CFAES  Spees Lab  OSUMC & CCC
EHE  ANSCI  NCH  CSW  BGSU

Support garden-based research at OSU funding #310466

http://spees11.wixsite.com/hope