Against the Grain
Bringing PCPs “back” into Cancer Care through Onco-Primary Care

Kevin C. Oeffinger, MD
Director, Duke Center for Onco-Primary Care
Professor with Tenure
Department of Medicine
Secondary: Department of Community & Family Medicine

Duke Community & Family Medicine Grand Rounds
June 18, 2018
• Cancer continuum (screening, prevention, cancer care, survivorship)
  – Current care model in U.S.
  – Onco-primary care model
• Duke Center for Onco-Primary Care (T+13 months)
People in the U.S., 2016

2016 Model
- Prevention
  - Lifestyle
  - (Chemoprevention)
  - (Genetics)
- Screening
  - One-size fits all
  - Cervical
  - Breast
  - Colon
  - Prostate
  - Lung
- Survivorship
  - One-size fits all

2026 Model
- Prevention
  - Lifestyle
  - Targeted chemoprevention
  - Population genetics
- Screening
  - Risk-stratified
  - Tumor biomarkers
  - Expanded cancers
- Survivorship
  - Risk-stratified
  - Efficient utilization of resources
  - Coordinated care
Advances in Cancer Screening
### ‘Screenable’ Cancers in the U.S.

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Cases/yr</th>
<th>% of total</th>
<th>% of deaths</th>
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<td>6.8%</td>
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<td>Colorectal</td>
<td>134,490</td>
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<td>8.3%</td>
</tr>
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<td>12,990</td>
<td>0.8%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Prostate</td>
<td>180,890</td>
<td>10.7%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Lung</td>
<td>224,390</td>
<td>13.3%</td>
<td>26.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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<td><strong>47.4%</strong></td>
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</tr>
<tr>
<td>Lung</td>
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<td>26.5%</td>
<td>16%</td>
</tr>
<tr>
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Key points:
- Almost 50% of cancer cases can potentially be detected by current screening tests
- These cancers account for about 50% of cancer deaths
- Substantial % of cancers detected at advanced stage
- Though not all screen-detected cancers can be cured, we can do MUCH better
1 in 8 women will be diagnosed with Breast Cancer in their lifetime.
How does a woman age 40-49 make an informed decision on breast cancer screening?


If we take 1,000 women at the age of 40 and follow them for 5 years with an annual mammogram,

- 6 in 1000
- 954
- 50 in 1000
If we take 1,000 women at the age of 40 and follow them for 5 years with an annual mammogram:

- 6 in 1,000
- 954 in 1,000
- 50 in 1,000

Family History and Breast Density:
- 6 → 12/1,000
- 6 → 1/1,000
- BRCA1 carrier → 80/1,000
- 1/12
If we take 1,000 women at the age of 40 and follow them for 5 years with an annual mammogram:

- 6 out of 1,000 develop breast cancer.
- 50 out of 1,000 have dense breast tissue.
- 1 out of 12 carries BRCA1.

These statistics suggest that risk-stratified cancer screening could be beneficial for early detection and treatment.
Mortality Results from a Randomized Prostate-Cancer Screening Trial

Gerald L. Andriole, M.D., E. David Crawford, M.D., Robert L. Grubb III, M.D., Saundra S. Buys, M.D., David Chia, Ph.D., Timothy R. Church, Ph.D., Mona N. Fouad, M.D., Edward P. Gelmann, M.D., Paul A. Kvale, M.D., Douglas J. Reding, M.D., Joel L. Weissfeld, M.D., Lance A. Yokochi, M.D., Barbara O’Brien, M.P.H., Jonathan D. Clapp, B.S., Joshua M. Rathmell, M.S., Thomas L. Riley, B.S., Richard B. Hayes, Ph.D., Barnett S. Kramer, M.D., Grant Izmirlian, Ph.D., Anthony B. Miller, M.B., Paul F. Pinsky, Ph.D., Philip C. Prorok, Ph.D., John K. Gohagan, Ph.D., and Christine D. Berg, M.D., for the PLCO Project Team†
No significant difference in prostate cancer deaths between two groups.

However, 90% of control group had undergone PSA testing.
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Screening and Prostate-Cancer Mortality in a Randomized European Study

Fritz H. Schröder, M.D., Jonas Hugosson, M.D., Monique J. Roobol, Ph.D., Teuvo L.J. Tammela, M.D., Stefano Ciatto, M.D., Vera Nelen, M.D., Maciej Kwiatkowski, M.D., Marcos Lujan, M.D., Hans Lilja, M.D., Marco Zappa, Ph.D., Louis J. Denis, M.D., Franz Recker, M.D., Antonio Berenguer, M.D., Liisa Määttänen, Ph.D., Chris H. Bangma, M.D., Gunnar Aus, M.D., Arnauld Villers, M.D., Xavier Rebillard, M.D., Theodorus van der Kwast, M.D., Bert G. Blijenberg, Ph.D., Sue M. Moss, Ph.D., Harry J. de Koning, M.D., and Anssi Auvinen, M.D., for the ERSPC Investigators
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20% reduction in prostate-specific mortality
Rate ratio = 0.80 (95% CI 0.65-0.98)
Screening for Prostate Cancer: U.S. Preventive Services Task Force Recommendation Statement

Virginia A. Moyer. MD. PhD. on behalf of the U.S. Preventive Services Task Force*

**Recommendation:** The USPSTF recommends against PSA-based screening for prostate cancer (grade D recommendation).
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<th>Population</th>
<th>Men aged 55 to 69 y</th>
<th>Men 70 y and older</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommendation</strong></td>
<td>The decision to be screened for prostate cancer should be an individual one. Grade: C</td>
<td>Do not screen for prostate cancer. Grade: D</td>
</tr>
</tbody>
</table>
Negoita S, et al. Cancer, 2018
Prostate Cancer Screening

**Patient Subgroup**

- **AUA Low Risk Patients**
  - Reality: Without immediate treatment, less than 5% of Low Risk patients will die of PCa
  - Treatment Paradigm: Yet the vast majority are treated upfront
  - Result without Improved Tools: Overtreatment Problem

- **AUA Intermediate Risk Patients**
  - Reality: More than half will experience BCR with single-modality treatment alone
  - Treatment Paradigm: Yet the majority do not receive multi-modality treatment

- **AUA High Risk Patients**

Duke Primary Care PSA Screening Algorithm

**Baseline PSA**
- PSA \( \geq 1.5 \, \text{ng/mL} \) refers to Multi-Disciplinary Prostate Screening Clinic
- PSA < 1.5 ng/mL and High risk (AA**) refer to Screen Q 2 years
- PSA < 1.5 ng/mL and Average risk refer to Resume screening at age 50

For age groups:
- **40-49***
- **50-69**
- **70-75**
Duke Primary Care and Duke Primary Care Consortium

224 primary care physicians
34 practice sites
7 counties
Expanding sites and physicians
All on same EHR (Epic)
Existing research infrastructure (PBRN)
Duke Primary Care PSA Screening Algorithm
Duke Primary Care PSA Screening Algorithm
Implementation Resulted in Increased Screening

Change in PSA Testing Pre-Post February 22, 2017

- Pre: 48%
- Post: 70%

Courtesy of Kevin Shah, MD
Screening increased in all clinics, but rates of screening by clinic vary widely.
## Urology Referrals
### February 22, 2017 – February 21, 2018

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Algorithm</th>
<th>PSAs</th>
<th>Urology Referrals</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>&lt;40 yrs</td>
<td>Do not screen</td>
<td>153</td>
<td>29</td>
<td>19.0%</td>
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<td>40-49</td>
<td>Resume screening at 50</td>
<td>3,421</td>
<td>152</td>
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<td>1,176</td>
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Key Lessons

• Rapid uptake using Epic with algorithm embedded in health maintenance / lab results
• Substantial variation in practice
• Under and over referrals
• Need for efficient and effective informed decision tool
Is prostate cancer screening right for you?

- Development and pilot testing of a CDC-supported patient decision aid for prostate cancer screening.
- Led by John Ragsdale, MD and Sharon Hull, MD
Potential Approaches to Help

• PCP level approaches
  – Adding Prostate Health Index (PHI) reflex
  – Role of Digital Rectal Exams
  – Alternative referral pathways

• Patient-level approaches
  – Pre-visit video vignettes via MyChart
  – Decision aid with visit (upcoming pilot test in 3 sites)
  – Improved lab result messaging within Epic

• System-level approaches
  – Nurse navigator (DCI-DPC liaison)
  – Better tracking of screening to referral to scheduled appointment
  – Multi-disciplinary quality improvement team
  – Primary care physician participation in GU oncology tumor board
Uptake of SERMs for chemoprevention in clinical practice

<table>
<thead>
<tr>
<th>Study</th>
<th>Uptake % (95% CI)</th>
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<tbody>
<tr>
<td>Clinic Metcalfe (2007)</td>
<td>10.7 (7.3–15.1)</td>
</tr>
<tr>
<td>Ozanne (2007)</td>
<td>7.7 (0.9–25.1)</td>
</tr>
<tr>
<td>Korfage (2013)</td>
<td>0.3 (0–1.2)</td>
</tr>
<tr>
<td>Bober (2004)</td>
<td>25.6 (18.3–34.0)</td>
</tr>
<tr>
<td>Port (2001)</td>
<td>4.7 (0.6–15.8)</td>
</tr>
<tr>
<td>Metcalfe (2008)</td>
<td>8.4 (7.0–10.0)</td>
</tr>
<tr>
<td>Waters (2012)</td>
<td>0.8 (0.6–1.0)</td>
</tr>
<tr>
<td>Taylor (2005)</td>
<td>6.8 (2.5–14.3)</td>
</tr>
<tr>
<td>Goldenberg (2007)</td>
<td>11.1 (5.7–19.0)</td>
</tr>
<tr>
<td>Rahman (2009)</td>
<td>31.3 (18.7–46.3)</td>
</tr>
<tr>
<td>Donnelly (2014)</td>
<td>10.6 (9.0–12.5)</td>
</tr>
<tr>
<td>Tchou (2004)</td>
<td>41.6 (33.3–50.3)</td>
</tr>
<tr>
<td>Kwong (2010)</td>
<td>0 (0–5.0)</td>
</tr>
<tr>
<td>Subtotal (I² = 97.2%, P &lt; 0.001)</td>
<td>8.7 (6.6–10.9)</td>
</tr>
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• ‘Liquid biopsy’
  – circulating cell-free DNA (cfDNA)
  – circulating tumor cells (CTC)
    Vockley JG and Niederhuber JE. BMJ, 2015

• Epigenetic-marker based system with detection rate of breast cancer similar to mammography

• Cancer interception
  Example: ErbB2 inhibition and lapatinib
  Li D, et al. Oncotarget, 2017
Probability of death from breast cancer or other causes among women age 50 and older with ER+ early stage breast cancer
SEER: 1988-2001


Percent of women with early stage breast cancer and a cardiovascular risk factor

Percent of breast cancer survivors adherent to their statin therapy prior to and following early stage breast cancer diagnosis and treatment (Group Health 1990-2008, N=4,221 women)

Predictors of nonadherence to medications among breast cancer survivors (Group Health 1990-2008, N=2,308)

<table>
<thead>
<tr>
<th></th>
<th>Antihypertensives</th>
<th>Oral diabetes medications</th>
<th>Statins</th>
</tr>
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<tr>
<td></td>
<td>Adjusted OR</td>
<td>(95% CI)</td>
<td>Adjusted OR</td>
</tr>
<tr>
<td>Primary care provider visits in the year post-BC diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less frequent (0–1 visit only)</td>
<td>1.70</td>
<td>(1.19–2.22)</td>
<td>1.81</td>
</tr>
<tr>
<td>Frequent (≥2 visits)</td>
<td>Reference</td>
<td></td>
<td>Reference</td>
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<tr>
<td><strong>P-trend</strong></td>
<td>0.001</td>
<td></td>
<td>0.074</td>
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• Most women with breast cancer will not die of breast cancer
• Continued monitoring and management of common comorbidities may be as important for longevity / QoL as treatment of the breast cancer
• Lack of standardized approaches to manage hypertension, diabetes, and lipid disorders
• Hypertension (pre/during/post cancer) is a key risk factor in development of heart failure in cancer survivors treated with cardiotoxic therapy

• Studies pre new AHA / ACC guidelines for HTN <120 / <80

• To date, no intervention studies aimed at blood pressure management during / after cancer therapy

• Other comorbidities associated with an increased risk of poor outcomes
47-year-old breast cancer survivor

- Diagnosed at age 42
- Invasive ductal carcinoma
- ER- PR- HER2+
- T2N1
- Trastuzumab
- 50 Gy to Right breast
47-year-old breast cancer survivor

- Diagnosed at age 42
- Invasive ductal carcinoma
- ER- PR- HER2+
- T2N1
- Trastuzumab
- 50 Gy to Right breast

Lipid profile
- Total = 247
- LDL = 188
- HDL = 51
- TG = 40

Statin therapy?

10-year risk = 1.8%
• Increasing number of patients with advanced cancer are now being treated as chronic cancer patients
• Management of comorbidities remains essential in this population
• ‘Cure the cancer, lose the patient’
Future Study

• Randomized controlled trial
• Population: Breast and prostate cancer patients receiving cardiotoxic therapy
• Primary outcome – blood pressure control
• Intervention: automated text alert to patient and Epic message to PCP when BP is above threshold
• Control – usual care
• Team: oncology, cardiology, primary care, population health science, biostatistics, onco-primary care
• Overarching goals:
  – Blood pressure management and prevention of cardiotoxicity
  – Re-engage PCPs in the care of patients on therapy
There are now 14.5 million survivors in the US. By 2020, there will be almost 18 million survivors.
Late Mortality Among 5+ Year Survivors
Childhood Cancer Survivor Study (N=20,483)

Causes

<table>
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<tr>
<th>Causes</th>
<th>SMR</th>
</tr>
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<tbody>
<tr>
<td>Second cancers</td>
<td>15.2</td>
</tr>
<tr>
<td>Cardiac</td>
<td>7.0</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>8.8</td>
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Cumulative Cause-Specific Mortality
Childhood Cancer Survivor Study

Late Mortality Among 5+ Year HL Survivors
MSKCC Hodgkin Lymphoma Study (1975-2000; N=747)

Cumulative incidence of death

- Dead from Hodgkin's lymphoma
- Dead from cause other than Hodgkin lymphoma
- Dead from unknown cause

Cumulative Incidence by Causes of Death for Patients With Stage I Testicular Seminoma

SEER Registry: N=9193 men; Diagnosed 1973-2001

Probability of death from breast cancer or other causes among women age 50 and older with ER+ early stage breast cancer  
SEER: 1988-2001
Cumulative incidence of chronic physical health conditions among 10,397 young adult survivors of childhood cancer

Childhood Cancer Survivor Study

- 73.4% with at least one chronic condition
- 42.4% with a severe or life-threatening condition or death

Morbidity following Adult Cancer

• To date, some studies looking at specific outcomes (SMN, cardiac) in specific cancer populations (Hodgkin lymphoma, testicular cancer)

• No overall estimates of morbidity

• U-shaped curve by age?
  o Younger age: developing organs
  o Mid-age: interaction of therapy with comorbid health conditions
  o Older age: senescent organs
<table>
<thead>
<tr>
<th>System</th>
<th>Exposures</th>
<th>Potential Late Effects</th>
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<tr>
<td>Cardiac</td>
<td>Radiation therapy, Anthracyclines</td>
<td>Valvular disease, Pericarditis, Myocardial infarction, Congestive heart failure</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>Radiation therapy, BCNU/CCNU, Bleomycin</td>
<td>Restrictive lung disease, Exercise intolerance</td>
</tr>
<tr>
<td>Renal/Urological</td>
<td>Radiation therapy, Platinums, Ifosfamide/Cyclophos</td>
<td>Atrophy or hypertrophy, Renal insufficiency or failure</td>
</tr>
<tr>
<td>Endocrine</td>
<td>Radiation therapy, Alkylating agents</td>
<td>Growth failure, Pituitary, thyroid, adrenal disease, Ovarian or testicular failure, Delayed 2° sex characteristics, Infertility</td>
</tr>
<tr>
<td>CNS</td>
<td>Radiation therapy, Intrathecal chemotherapy</td>
<td>Learning disabilities, Cognitive dysfunction</td>
</tr>
<tr>
<td>Psychological</td>
<td>Cancer</td>
<td>Post-traumatic stress, Employment &amp; educational problems, Insurance discrimination, Adaptation/problem solving</td>
</tr>
<tr>
<td>Second malignancies</td>
<td>Radiation therapy, Alkylating agents, Epipodophyllotoxins</td>
<td>Solid tumors, Leukemia, Lymphoma</td>
</tr>
</tbody>
</table>
Factors contributing to late effects

- Aging
- Premorbid conditions
- Genetic: BRCA, ATM, p53 polymorphisms
- Tumor factors: Histology, Site, Biology, Response
- Treatment factors: Surgery, Chemotherapy, Radiation therapy
- Host factors: Age, Gender, Race
- Treatment events
- Health behaviors: Tobacco, Diet, Alcohol, Exercise, Sun
Second Primary Cancer (SPC)

• 20% of incident cancers are a second (or subsequent) primary cancer

• Causal pathways:
  – Lifestyle habits
  – Aging
  – Genetic factors
  – Treatment exposures for the first cancer
  – All of the above (interactions)
### Risk prediction model – 10-year cumulative risk of SPC

Cohort of 293,435 from 12 French registries

**FEMALES**

Calendar period for first cancer – 2007-2010

<table>
<thead>
<tr>
<th>Age at first cancer</th>
<th>First Breast Cancer</th>
<th>First Colorectal Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10-yr cumulative risk</td>
<td>Difference with general population</td>
</tr>
<tr>
<td>55 - 64 yrs</td>
<td>6.8%</td>
<td>+1.5%</td>
</tr>
<tr>
<td>65 - 74</td>
<td>9.3%</td>
<td>+1.9%</td>
</tr>
<tr>
<td>&gt; 75</td>
<td>10.5%</td>
<td>+2.0%</td>
</tr>
</tbody>
</table>

**SPC after Prostate or Colorectal Cancer**

**Risk prediction model – 10-year cumulative risk of SPC**
Cohort of 293,435 from 12 French registries

**MALES**
Calendar period for first cancer – 2007-2010

<table>
<thead>
<tr>
<th>Age at first cancer</th>
<th>First Prostate Cancer</th>
<th>First Colorectal Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10-yr cumulative risk</td>
<td>Difference with general population</td>
</tr>
<tr>
<td>55 - 64 yrs</td>
<td>13.1%</td>
<td>+5.5%</td>
</tr>
<tr>
<td>65 - 74</td>
<td>16.0%</td>
<td>+5.0%</td>
</tr>
<tr>
<td>&gt; 75</td>
<td>16.4%</td>
<td>+2.5%</td>
</tr>
</tbody>
</table>

SPC in TP53 carriers

NCI Li-Fraumeni Syndrome Cohort (N=286)
Risk of SPC by time since first cancer and by age

## Colon Cancer Family Registry (N=764)

Cumulative risk of extracolonic cancer following CRC

<table>
<thead>
<tr>
<th>Cancer site</th>
<th>10 years</th>
<th></th>
<th>20 years</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Risk, %</td>
<td>(95% CI)</td>
<td>Risk, %</td>
<td>(95% CI)</td>
</tr>
<tr>
<td>Both sexes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kidney etc.*</td>
<td>1.90</td>
<td>(0.87 to 3.17)</td>
<td>5.15</td>
<td>(2.86 to 7.68)</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>1.61</td>
<td>(0.65 to 2.75)</td>
<td>3.15</td>
<td>(1.37 to 5.20)</td>
</tr>
<tr>
<td>Small intestine</td>
<td>0.92</td>
<td>(0.28 to 1.73)</td>
<td>4.00</td>
<td>(1.92 to 6.41)</td>
</tr>
<tr>
<td>Stomach</td>
<td>0.66</td>
<td>(0.13 to 1.40)</td>
<td>1.15</td>
<td>(0.19 to 2.48)</td>
</tr>
<tr>
<td>Hepatobiliary tract†</td>
<td>0.83</td>
<td>(0.16 to 1.69)</td>
<td>1.42</td>
<td>(0.42 to 2.73)</td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prostate</td>
<td>2.74</td>
<td>(0.86 to 4.77)</td>
<td>5.90</td>
<td>(2.69 to 9.76)</td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endometrium</td>
<td>12.12</td>
<td>(7.66 to 17.11)</td>
<td>23.99</td>
<td>(16.79 to 32.84)</td>
</tr>
<tr>
<td>Breast</td>
<td>1.94</td>
<td>(0.58 to 3.83)</td>
<td>11.38</td>
<td>(0.63 to 16.69)</td>
</tr>
<tr>
<td>Ovary</td>
<td>0.94</td>
<td>(0.00 to 2.11)</td>
<td>2.08</td>
<td>(0.50 to 4.14)</td>
</tr>
</tbody>
</table>

* Kidney etc. included kidney, renal pelvis, ureter and other and unspecified urinary organs.

† Hepatobiliary tract included liver and intrahepatic bile duct, gall bladder, and other and unspecified parts of biliary tract.
Dutch HL Cohort (N=3905)
Age 15-50 at HL diagnosis, 1965-2000

Lung cancer after Hodgkin lymphoma

Case-Control study from population-based registry
Age at Hodgkin lymphoma – median 50 years

Relative Risk

Treatment Group
N/N  N/Alk  RT/N  RT/Alk

Non / Light Smoker
Moderate-Heavy Smoker

Mary presents to your office with a 2 month history of vague, non-exertional chest pain. She was treated at the age of 20 for stage IIA nodular sclerosing Hodgkin lymphoma with 21 Gy involved field radiotherapy, including the neck, mediastinum and the para-aortic nodes, and 6 cycles of ABVD.

Mary’s only cardiovascular risk factor is dyslipidemia. She has also been fairly sedentary. Her paternal uncle had an MI at the age of 59 yrs.
Mary presents to your office with a 2 month history of vague, non-exertional chest pain. She was treated at the age of 20 for stage IIA nodular sclerosing Hodgkin lymphoma with 21 Gy involved field radiotherapy, including the neck, mediastinum and the para-aortic nodes, and 6 cycles of ABVD.

Mary's only cardiovascular risk factor is dyslipidemia. She has also been fairly sedentary. Her paternal uncle had an MI at the age of 59 yrs.

• What is her ‘pre-probability’ risk of a myocardial infarction in the next 10 years?
• What is the preferred next step, other than proceeding to a cardiac catheterization?
21 Gy Irradiation to 20 year-old with Hodgkin lymphoma

Courtesy of Constine LS.
Hodgson DC, et al. Semin Radiat Oncol 2007
Involved Nodal Radiation

Courtesy of Hodgson D.
Men and women treated with mediastinal radiotherapy have a substantially elevated risk of coronary artery disease.

- 20 yrs post moderate-dose RT (37.2 Gy), actuarial risk of symptomatic CAD = 21.2%

- By 30 yrs, incidence of MI = 12.9%

- Standardized Mortality Ratio with MI = 3.2
Cumulative incidence of coronary heart disease in HL survivors diagnosed prior to age 51 (1965-1995)

By age 40, 5.5% with CHD

10-yr risk = 12%
Figure 1. Implementation of Risk Assessment Work Group Recommendations

Does the patient have existing clinical ASCVD?

Yes → See 2011 AHA/ACC Secondary Prevention Guideline and 2013 Adult Prevention Guidelines:
- Blood Cholesterol
- Obesity
- Lifestyle Management

No → Yes → See 2012 NHLBI Pediatric CV Risk Reduction Guidelines and 2013 Adult Prevention Guidelines:
- Blood Cholesterol
- Obesity

No → Is the patient <20 y or >79 y of age?

Yes → Communicate risk data and refer to 2013 Adult Prevention Guidelines:
- Blood Cholesterol
- Obesity

No → Assess traditional risk factors every 4-5 y in patients 20-79 y of age; estimate 10-y risk in those 40-79 y of age using Pooled Cohort Equations

Elevated 10-y risk (≥7.5%)

Low 10-y risk (<7.5%)

Assess 30-y or lifetime risk in those 20-59 y of age; Communicate risk data regardless of age and refer to AHA/ACC Lifestyle Guidelines
# Pooled Cohort Risk Assessment Equations

Predicts 10-year risk for a first atherosclerotic cardiovascular disease (ASCVD) event

## Risk Factors for ASCVD

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
</tr>
<tr>
<td>Age</td>
<td>40 years</td>
</tr>
<tr>
<td>Race</td>
<td>White or other</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>105 mmHg</td>
</tr>
<tr>
<td>Receiving treatment</td>
<td>No</td>
</tr>
<tr>
<td>Receiving treatment</td>
<td>Yes</td>
</tr>
<tr>
<td>for high blood</td>
<td></td>
</tr>
<tr>
<td>pressure</td>
<td>(if SBP &gt; 120 mmHg)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>No</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Yes</td>
</tr>
<tr>
<td>Smoker</td>
<td>No</td>
</tr>
<tr>
<td>Smoker</td>
<td>Yes</td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>232 mg/dL</td>
</tr>
<tr>
<td>HDL Cholesterol</td>
<td>38 mg/dL</td>
</tr>
</tbody>
</table>

[Reset][Calculate]
Pooled Cohort Risk Assessment Equations

Predicts 10-year risk for a first atherosclerotic cardiovascular disease (ASCVD) event.

Risk Factors for ASCVD

Gender: Female
Age: 40 years
Race: White or other
Total Cholesterol: 232 mg/dL
HDL Cholesterol: 38 mg/dL
Smoker: No
Diabetes: No
Receiving treatment for blood pressure (if SBP ≥ 130 mmHg): No

10-year risk = 12%

ASCVD Risk Evaluation

- 10-year risk of atherosclerotic cardiovascular disease event
- This Patient's 10-Year Risk: 1.1%
- 10-Year Risk with Optimal Risk Factors: 0.4%

Clincalc.com
Need for validated CAD risk prediction models for cancer survivors

Salz T, et al
MSK and Danish Cancer Institute
Monitor for recurrence of cancer
Surveillance for second cancers and late effects
  - Early diagnosis and intervention
Prevention
  - Tobacco use, physical activity, calcium intake
Counseling and targeted education

Oeffinger KC. Institute of Medicine, 2003
Oeffinger KC, Hudson MM. CA Cancer J Clin 54:208-236, 2004
In the interval from January 1, 2016 – June 30, 2017 (18 months), the following unique patients were seen by Duke oncology providers:

<table>
<thead>
<tr>
<th>Cancer</th>
<th>INTERVAL FROM CANCER DIAGNOSIS, YRS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 3.0</td>
</tr>
<tr>
<td>Breast</td>
<td>1050</td>
</tr>
<tr>
<td>GI</td>
<td>1460</td>
</tr>
<tr>
<td>GU</td>
<td>1271</td>
</tr>
<tr>
<td>GYN</td>
<td>593</td>
</tr>
<tr>
<td>All cancers</td>
<td>8574</td>
</tr>
</tbody>
</table>
In the interval from January 1, 2016 – June 30, 2017 (18 months), the following unique patients were seen by Duke oncology providers.

<table>
<thead>
<tr>
<th>Cancer Site</th>
<th>&lt; 3.0</th>
<th>3.0 – 4.9</th>
<th>5.0 – 9.9</th>
<th>10.0 – 20.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>1050</td>
<td>503</td>
<td>903</td>
<td>772</td>
</tr>
<tr>
<td>GI</td>
<td>1460</td>
<td>300</td>
<td>408</td>
<td>169</td>
</tr>
<tr>
<td>GU</td>
<td>1271</td>
<td>513</td>
<td>860</td>
<td>509</td>
</tr>
<tr>
<td>GYN</td>
<td>593</td>
<td>278</td>
<td>332</td>
<td>182</td>
</tr>
<tr>
<td>All cancers</td>
<td>8574</td>
<td>2784</td>
<td>4296</td>
<td>2729</td>
</tr>
</tbody>
</table>

With 2018 Value-Based Care, can we (DCI/DUHS) afford to continue following 7,000 individuals who are 5+ year cancer survivors?
Systematic review of 35 articles, 10,941 PCPs

- 45% involved during cancer treatment
- 70-80% during survivorship
- 95% preferred a more active role across phases
- 50% felt unprepared to manage late effects
- Rarely and inconsistently received sufficient information from oncologists

Intermediate risk
• Moderate dose radiation
• Moderate dose chemotherapy

High risk
• Bone marrow transplantation
• High dose radiation or chemotherapy

Intermediate risk
• Moderate dose radiation
• Moderate dose chemotherapy

Low risk
• Surgery only, or
• Surgery with low dose chemotherapy
Risk-Stratified Shared Care Model for Cancer Survivors

Low Risk:
All of the following:
- Surgery only or chemotherapy that did not include alkylating agent, anthracycline, bleomycin, or epipodophyllotoxin
- No radiation
- Low risk of recurrence
- Mild or no persistent toxicity of therapy

Communication Points with Primary Care Physician

a. Cancer diagnosis and planned therapeutic approach, brief overview of chemotherapy, radiation therapy and/or surgery.
b. Survivorship Care Plan: cancer diagnosis, cancer therapy, surveillance recommendations, contact information.
c. Periodic update with changes in surveillance recommendations, and new information regarding potential late effects.
d. Periodic update of survivor's health for primary care physician's record.

Abbreviations:
Ca=cancer; Dx=diagnosis; Off Rx=completion of cancer therapy; PCP=primary care physician; LTFU=long-term follow-up (survivor) program; Onc=oncologist

Primary responsibility for cancer-related care; PCP continues to manage noncancer comorbidities and routine preventive health maintenance.

*Primary care physician.*

Oeffinger KC, McCabe MS. J Clin Oncol, 2005
McCabe MS, et al. Semin Oncol, 2013
**Moderate Risk:**

- Any of the following:
  - Low or moderate dose alkylating agent, anthracycline, bleomycin, or epipodophyllotoxin
  - Low to moderate dose radiation
  - Autologous stem cell transplant
  - Moderate risk of recurrence
  - Moderate persistent toxicity of therapy

**High Risk:**

- Any of the following:
  - High dose alkylating agent, anthracycline, bleomycin, or epipodophyllotoxin
  - High dose radiation
  - Allogeneic stem cell transplant
  - High risk of recurrence
  - Multi-organ persistent toxicity of therapy

---

Oeffinger KC, McCabe MS. J Clin Oncol, 2005
McCabe MS, et al. Semin Oncol, 2013
Independent Advanced Practice Provider (NP/PA)

Time of transition

Focus of visit
- Surveillance for recurrence of primary cancer
- Preparation of Survivorship Care Plan
- Evaluation for medical and psychosocial late effects
- Education about survivorship issues and availability of community resources
- Health promotion counseling

Duration of care by APP

Shared care with primary care provider

Pilot nurse navigator embedded in primary care
• MD-APP team
• Populations:
  – Cancer survivors at high risk of a serious late effect or with persistent multi-organ toxicity
  – Chronic cancer patients
• Focus of visit
  – Surveillance for recurrence of primary cancer
  – Screening and management of late effects
  – Other aspects of risk-based survivorship care
• Duration of care
• Shared care with primary care provider
ASCO Survivorship Care Plan Template

### ASCO Treatment Summary and Survivorship Care Plan

**General Information**

- **Patient Name:**
- **Patient DOB:**
- **Patient phone:**
- **Email:**
- **Primary Care Provider:**
- **Surgeon:**
- **Radiation Oncologist:**
- **Medical Oncologist:**
- **Other Providers:**

**Treatment Summary**

- **Diagnosis**
  - **Cancer Type/Location/Histology Subtype:**
  - **Stage:**
    - ☐ [ ]
    - ☑ [ ]
    - ☐ [ ]
    - Not applicable

**Treatment**

- **Surgery** [ ] Yes [ ] No
  - **Surgery Date(s)** (year):
- **Radiation** [ ] Yes [ ] No
  - **Body area treated:**
  - **End Date** (year):
- **Systemic Therapy (chemotherapy, hormonal therapy, other)** [ ] Yes [ ] No
- **Names of agents Used**
  - **End Dates** (year):

**Persistent symptoms or side effects at completion of treatment:** ☐ No ☑ Yes [enter type(s)]:

### Familial Cancer Risk Assessment

- **Genetic/hereditary risk factors or predisposing conditions:**
- **Genetic counseling:** ☐ Yes ☑ No
- **Genetic testing results:**

### Follow-up Care Plan

- **Need for ongoing (adjuvant) treatment for cancer:** [ ] Yes [ ] No
- **Additional treatment name**
- **Planned duration**
- **Possible Side effects**

### Schedule of clinical visits

- **Coordinating Provider**
  - **When/How often**

### ASCO Survivorship Care Plan

Updated based on consensus conference held on 9.27.13 and the ASCO Survivorship Committee

**Cancer surveillance or other recommended related tests**

<table>
<thead>
<tr>
<th>Coordinating Provider</th>
<th>What/When/How Often</th>
</tr>
</thead>
</table>

- Please continue to see your primary care provider for all general health care recommended for a [man] [woman] your age, including cancer screening tests. Any symptoms should be brought to the attention of your provider:
  1. Anything that represents a brand new symptom;
  2. Anything that represents a persistent symptom;
  3. Anything you are worried about that might be related to the cancer coming back.

### Possible late- and long-term effects that someone with this type of cancer and treatment may experience:

- Cancer survivors may experience issues with the areas listed below. If you have any concerns in these or other areas, please speak with your doctors or nurses to find out how you can get help with them.
  - Emotional and mental health
  - Fatigue
  - Weight changes
  - Smoking
  - Physical functioning
  - Insurance
  - School/Work
  - Fasting
  - Financial advice or assistance
  - Memory or concentration loss
  - Parenting
  - Fertility
  - Sexual functioning

### A number of lifestyle/behaviors can affect your ongoing health, including the risk for the cancer coming back or developing another cancer. Discuss these recommendations with your doctor or nurse:

- Tobacco use/cessation
  - Diet
  - Alcohol use
  - Sunscreen use
  - Weight management (loss/gain)
  - Physical activity

**Resources you may be interested in:**

- Other comments:

**Prepared by:**
**Delivered on:**

---

Aims of Center

1. Deliver evidence-based, patient-centered, personalized health care across the cancer continuum by enhancing the interface between cancer specialists and primary care clinicians;

2. Conduct innovative research with cutting-edge technology that can be translated to the community setting; and

3. Train and educate the next generation of clinicians and researchers to extend this mission.
Duke Center for Onco-Primary Care

Washington / Fulkerson / Owens
Kastan / Patierno

Duke Center for Onco-Primary Care Team

Oeffinger
Corbett
Ragsdale

Associate Director
2 physician researchers
2 health service researchers
Support staff

Duke Regional and Duke Raleigh
Duke Cancer Research Network
(23 sites across eastern U.S.)
WakeMed
Duke Center for Onco-Primary Care
External Advisory Board

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Eva Grunfeld, MD, Dphil Dept of Family Medicine University of Toronto Toronto, Canada
Richard Wender, MD American Cancer Society Atlanta, GA
Jamie von Roen, MD American Society of Clinical Oncology Alexandria, VA

Ann Partridge, MD Dana Farber Cancer Institute Boston, MA
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Deborah Mayer, RN, PhD UNC Lineberger Cancer Center Chapel Hill, NC
Wendy Demark-Wahnefried, PhD, RD UAB Cancer Center Birmingham, AL
Electra Paskett, PhD Ohio State University Cancer Center Columbus, OH
Duke Center for Onco-Primary Care
Distributed Care Model

Duke Primary Care
(224 primary care physicians in 34 sites across 7 counties)

Onco-trained primary care physician
• Patients throughout Duke University Health System
  (225 Primary care clinicians in 34 practice sites (rapidly expanding)
    – 7,500 new cancer cases per year
• Across the Eastern seaboard through the 21-center Duke Cancer Network
• Via future DUHS partnerships and alliances including the expansion into Wake County and statewide.
• Encompassed within these clinical and research goals will be a concerted effort to reduce cancer disparities within these populations and, in partnership with other institutions, throughout North Carolina.
Currently, there are shortcomings in our care across the cancer continuum
Care will become much more complex in the next decade
Need for radical practice redesign
International examples:
  – Canada (Grunfeld)
  – Australia (Emery / Jeffords)
Questions?
kevin.oeffinger@duke.edu