

Coleman Supportive Oncology Initiative

Survivorship Training Module

Topic: Prevention and Cancer Screening

Presenters: Patricia Robinson, MD and Frank J. Penedo, PhD

Version: 07132016

Learning Objectives

By the end of this module you should be able to:

- 1. Discuss appropriate cancer screening**
- 2. Identify cancer prevention strategies**

Prevention Defined

- **Prevention is the first phase of the cancer control continuum. It is intended to reduce cancer incidence and mortality.**
- **Cancer development is not a distinct event, but rather a process that occurs over time.**

Primary Prevention

- **Primary prevention is the use of an intervention that alters the genetic, biologic and environmental factors associated with causation.**
- **Examples of primary prevention:**
 - Smoking cessation
 - Sun avoidance
 - Diet modification
 - Weight loss and physical activity
 - Avoidance of occupational carcinogenesis
 - Avoidance of ionizing radiation
 - Cancer virus vaccination

Secondary Prevention

- **Secondary prevention includes screening for asymptomatic cancers, which is intended to detect early stage cancers so that treatment can be introduced earlier to reduce mortality.**

Chemoprevention

- **Cancer chemoprevention is the use of natural or synthetic chemical agents to reverse, suppress, or prevent cancer before the development of an invasive malignant process.**
- **Compounds of interest in chemoprevention include anti-inflammatory agents, antioxidants, differentiating agents, or hormone antagonists.**

Second Primary Cancers in Cancer Survivors

- **Second cancers may occur in cancer survivors due to genetic mutations, sequelae of cancer treatment, and/or risk factors that led to the first cancer, e.g., smoking.**
- **The overall cancer rate is greater in cancer survivors than in the general population.**

Colorectal Cancer Screening

- **It is recommended that colon cancer screening for patients at average risk begins at age 50.**
- **Acceptable options include colonoscopy every 10 years, annual fecal-based tests, or flexible sigmoidoscopy every 5 years with or without an interval stool-based test at year 3.**

Lung Cancer Screening

- **Lung cancer screening is not recommended in people who are at average risk for lung cancer.**
- **Lung cancer screening is recommended for individuals at high risk of lung cancer who:**
 - **Have at least a 30-pack/year smoking history;**
 - **Are still smoking or have quit smoking within the last 15 years; and**
 - **Are 55 to 74 years of age and in fairly good health**
- **Given the high rate of false positive results, the risks and benefits of lung cancer screening should be discussed with the individual before a low dose CT scan is obtained.**

Cervical Cancer Screening

- **Cervical cancer screening should start at age 21.**
- **Women between the ages of 21 and 29 should have a Pap test done every 3 years. HPV testing should not be used in this age group unless it is needed after an abnormal Pap test result.**
- **Women between the ages of 30 and 65 should have a Pap test plus an HPV test done every 5 years.**
- **Women over age 65 who have had regular cervical cancer testing in the past 10 years with normal results should not be tested for cervical cancer. Once testing is stopped, it should not be started again.**
- **Women with a history of a serious cervical pre-cancer result should continue to be tested for at least 20 years after that diagnosis, even if testing goes past age 65.**
- **Women who are post total hysterectomy, for reasons not related to cervical cancer or serious pre-cancerous lesions, should not be tested.**
- **All women who have been vaccinated against HPV should still follow the screening recommendations for their age groups.**

Breast Cancer Screening

- **These guidelines are for women at average risk for breast cancer:**
 - Women ages 40 to 44 should have the choice to start annual breast cancer screening with mammograms if they wish to do so. The risks of screening, as well as the potential benefits, should be considered.
 - Women ages 45 to 54 should get mammograms every year.
 - Women ages 55 and older should switch to mammograms every 2 years, or have the choice to continue yearly screening.
 - Screening should continue as long as a woman is in good health and is expected to live 10 more years or longer.

Breast Cancer Screening

- These guidelines are for women at higher than average risk for breast cancer, as outlined below.
- Women at higher than average risk should get an MRI and a mammogram every year. This includes women who:
 - Have a lifetime risk of breast cancer of about 20% to 25% or greater, according to risk assessment tools based mainly on family history (such as the Claus model – see below)
 - Have a known *BRCA1* or *BRCA2* gene mutation
 - Have a first-degree relative (parent, brother, sister, or child) with a *BRCA1* or *BRCA2* gene mutation, and have not had genetic testing themselves
 - Had radiation therapy to the chest when they were between the ages of 10 and 30 years
 - Have Li-Fraumeni syndrome, Cowden syndrome, Bannayan-Riley-Ruvalcaba syndrome, or have first-degree relatives with one of these syndromes

Prostate Cancer

- **Starting at age 50, men should talk to a doctor about the pros and cons of testing so they can decide if testing is the right choice for them.**
- **If they are African-American or have a father or brother who had prostate cancer before age 65, men should have this talk with a doctor starting at age 45.**
- **If men decide to be tested, they may have the PSA blood test with or without a rectal exam. How often they are tested will depend on their PSA level.**
- **Research has not yet proven that the potential benefits of testing outweigh the harms of testing and treatment.**

General Principles of a Healthy Lifestyle

- **Achieve and maintain a healthy body weight**
- **Participate in physical activity**
- **Maintain a healthy diet**
- **Minimize alcohol intake**
- **Avoid tobacco products**
- **Minimize sun exposure**

Summary of Points Covered

In this training module we addressed:

- **The definition of primary and secondary prevention, with examples of each strategy**
- **Current cancer screening guidelines**
- **The general principles of a healthy lifestyle, which correlate to cancer risk**

Next Steps

For more detailed training on this topic, you can go to the following resources:

National Comprehensive Cancer Network®

- [NCCN Clinical Guidelines®- NCCN GUIDELINES FOR DETECTION, PREVENTION, & RISK REDUCTION](http://www.nccn.org/professionals/physician_gls/f_guidelines.asp#detection)

http://www.nccn.org/professionals/physician_gls/f_guidelines.asp#detection

American Society of Clinical Oncology ASCO®

- [Cancer Prevention](http://www.asco.org/practice-research/cancer-prevention)

<http://www.asco.org/practice-research/cancer-prevention>

American Cancer Society

- [Variety of Prevention Topics, search “Prevention” on ACS site](http://www.cancer.org/index)

<http://www.cancer.org/index>

- [Cancer Screening Guidelines](http://www.cancer.org/healthy/findcancerearly/cancerscreeningguidelines/index)

<http://www.cancer.org/healthy/findcancerearly/cancerscreeningguidelines/index>

Faculty Bio for Patricia Robinson, MD

Institution/title: Cardinal Bernardin Cancer Center, Loyola University

Roles: Director, Cancer Survivorship Clinic; Associate Professor, Department of Hematology and Medical Oncology, Loyola University Medical Center

Area of Expertise: Breast oncology, Cancer survivorship, Cancer Disparities

Practice type: Academic Medical Center/ University

Organization/Association Memberships: Member, Health Disparities Committee 2014-2017

Bio: Dr. Robinson is an Associate Professor of Medicine at Loyola University. She specializes in breast oncology. She graduated from the University of Michigan with a B.S. and received her M.D. from Michigan State University. Dr. Robinson completed her residency at Loyola University and Fellowship in Hematology-Oncology at Fox Chase Cancer Center. Dr. Robinson serves as the Director of the Cancer Survivorship Clinic at the Cardinal Bernardin Cancer Center. She serves on the Cancer Survivorship Committee and Breast Committee of the Southwest Oncology Group. In addition to clinical research, Dr. Robinson has several roles in the medical school. She serves as the assistant director for the Internal Medicine clerkship.

For additional information:

<https://www.loyolamedicine.org/doctor/patricia-robinson>

Faculty Bio for Frank J. Penedo, PhD

Dr. Frank J. Penedo is the Roswell Park Professor of Medical Social Sciences, Psychology and Psychiatry and Behavioral Sciences. He is also the Program Leader of the Cancer Control and Survivorship Program in the Lurie Cancer Center and the Director of the Cancer Survivorship Institute at Northwestern Medicine. He is trained in clinical psychology and behavioral medicine and his research has focused on evaluating the role of psychosocial, sociocultural and biobehavioral processes in adjustment, health related quality of life (HRQOL) and health outcomes in chronic disease populations with a major emphasis on diverse cancer survivors in regard to race, ethnicity and socio-economic status. Dr. Penedo has served as PI, co-PI or project leader on multiple NIH-funded studies addressing psychosocial and biobehavioral correlates of adjustment and the efficacy of psychosocial interventions in improving HRQOL, symptom burden and health outcomes in chronic disease populations. He has significant expertise in community based, cohort and intervention studies that target cancer survivors and involve collection and analyses of psychosocial and biological data. He has over 110 peer-reviewed publications, has served as associate editor of two major journals in his field, and some of his translational work has been disseminated as clinical intervention tools. Dr. Penedo currently serves as a standing member of the NIH BMIO study section and on the editorial board of several major journals in his field. He is the president elect of the International Society of Behavioral Medicine, a fellow of the Society of Behavioral Medicine and a member of the Academy of Behavioral Medicine Research. He has received numerous awards and also served on the advisory boards of community organizations such as the Wellness Community, the Intercultural Cancer Council and Salud America.

Link to website with additional information about the faculty member:

<http://www.feinberg.northwestern.edu/faculty-profiles/az/profile.html?xid=24719>

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National Comprehensive Cancer Network®. NCCN Guidelines®, NCCN Guidelines for Detection, Prevention, & Risk Reduction. http://www.nccn.org/professionals/physician_gls/f_guidelines.asp#detection. Accessed 01/14/2016

National Comprehensive Cancer Network®. NCCN Guidelines® for Survivorship, Version 2.2015. http://www.nccn.org/professionals/physician_gls/pdf/survivorship.pdf. Accessed 01/14/2016

Coleman Supportive Oncology Initiative

Survivorship Training Module

Topic: Genetic Testing for Patients, Families and Survivors

Presenters: Carol A. Rosenberg, MD and Shelly S. Lo, MD

Learning Objectives

By the end of this module you should be able to:

- 1. Identify the reasons for genetic counseling in a cancer survivor**
- 2. Describe the impact of a BRCA mutation on medical management of a cancer survivor**
- 3. Describe the impact of Lynch syndrome on medical management of a cancer survivor**

Genetic Testing:

- **Cancer risk assessment and genetic counseling are recommended when test is offered (pre-test counseling) and after results are disclosed (post-test counseling)**
- **A genetic counselor, medical geneticist, physician, nurse, or other health professional with expertise and experience in cancer genetics should be involved.**

Why test the patient with cancer?

1. To provide information about risk for new cancers

- Not recurrence risk

2. May impact medical management and surveillance¹

- Risk-reducing surgery to reduce risk of developing new cancers
- More frequent or alternative screening regimens
- Chemo-preventive opportunities

3. To provide information for at-risk family members¹

- Testing is often most informative in affected patients
- Test result helps guide testing recommendations for the family
- Testing patient with cancer helps avoid the “uninformative negative” test in family members without cancer

Did you forget dad?

- History is unlikely to be volunteered without direct questioning
- Lack of awareness about paternal history of breast and ovarian cancer
 - Providers unaware
 - Patients unaware
- Patients 5x more likely to be referred with cancer on the maternal side

¹ NCCN Guidelines® for Genetic/Familial High-Risk Assessment: Breast and Ovarian, Version 2.2015

Hereditary Breast and Ovarian Cancer (HBOC) Syndrome: Overview

- **Most common gene mutations:**
 - BRCA1/BRCA2
- **Autosomal dominant germline mutation**
 - Inheritance of mutated gene may be from the mother or father, or other similar definition of autosomal dominant.
 - Offer genetic counseling and testing to first-degree family members of mutation carriers.
 - Consider referral of family members to cancer risk assessment clinics and PCP for enhanced surveillance or risk-reducing surgery.
- **Other associated cancers:**
 - Pancreas
 - Prostate
- **Prevalence**
 - 5-10% of all breast cancers
 - >10% of breast cancers diagnosed <age 40
 - Higher prevalence in Ashkenazi Jewish population

Cancer Risk in BRCA Mutation Carriers

If you HAVE had Breast or Ovarian Cancer	Mutation Carrier	General Population
Ovarian Cancer	15%	n/a
Breast Cancer after 5 yrs	27%	3.5%
Breast Cancer by age 70	64%	13%

Other Cancer risks	Mutation Carrier	General Population
Prostate Cancer by age 80	20%	15%
Pancreatic Cancer by age 80	2-4%	<1%

Impact on Medical Management for the Cancer Patient with a BRCA Mutation

■ Breast Cancer Survivors

- Contralateral breast cancer risk
 - Risk-reducing mastectomy vs. screening MRI and mammograms
- Ovarian cancer risk
 - Risk-reducing bilateral salpingo-oophorectomy recommended
 - Consider screening with CA-125 and vaginal US in patients who decline risk-reducing surgery

■ Ovarian Cancer Survivors

- Breast cancer risk
 - Bilateral risk-reducing mastectomy vs. screening MRI and mammograms

■ Consider Risk of Recurrence

- Determined by stage/grade, **not** mutation status
- Usually highest in the first 2-5 years after treatment

Lynch Syndrome (HNPCC): Overview

- **Most common gene mutations:¹**
 - MLH1, MSH2, MSH6 and PMS2
- **Autosomal dominant germline mutation**
- **Associated cancers:¹**
 - Most common: colon, uterine, gastric, ovarian
 - Others: urothelial, hepatobiliary, renal, small bowel, central nervous system, breast, pancreatic
- **Expressivity in women:**
 - Gynecologic cancer, **not colon**, is often the primary cancer in women
 - Later mean age of colon cancer than men (60 vs. 55)

¹ NCCN Guidelines® for Genetic/Familial High-Risk Assessment: Colorectal, Version 2.2015

Impact on Medical Management for the Cancer Patient with Lynch Syndrome

■ Colon Cancer Patient

- Risk for new/metachronous colon cancer:
 - Yearly colonoscopy (reduces incidence of new primary by 50%)
 - Consider prophylactic colectomy at the time of diagnosis
- If female, risk for uterine and ovarian cancer:
 - Consider prophylactic TAH/BSO at completion of childbearing
 - Dysfunctional uterine bleeding warrants evaluation
 - No clear evidence for uterine or ovarian cancer screening
- Breast cancer: Screening mammography
- Gastric and small bowel:
 - No evidence for additional screening
 - Select individuals may consider EGD every 3-5 yrs
- Urothelial cancer: Consider annual urine cytology
- Pancreatic cancer: No evidence for additional screening.

■ Uterine and Ovarian Cancer patients

- Risk for colon cancer:
 - Yearly colonoscopies starting age 25
- Regular screening for other cancers (above)

Summary of Points Covered

In this training module we addressed:

- Genetic testing for the cancer survivor:
 - Impacts risk for new cancers and therefore impacts medical management, chemo-preventive opportunities and surveillance/screening
 - Provides critical information (- or + results) for family members
- Patients are more likely to be referred to a genetic counselor if there is a family history of breast or ovarian cancer on the maternal side. A family history of breast or ovarian cancer on the paternal side is unlikely to be volunteered without direct questioning. Therefore, healthcare providers should specifically inquire about a family history of breast or ovarian cancer on the paternal side in addition to the maternal side.
- Survivorship health professionals will play an important role in ensuring that survivors get appropriate referrals for genetic testing and will thereby assist patients with timely access to appropriate surveillance, screening and treatment.

McCuaig, JM, et al. Comment in Lancet Oncology, 2010) doi:10.1016/S1470-2045(10)70246-1

Next Steps

For more detailed training on this topic you can go to the following resources:

National Comprehensive Cancer Network®

- [NCCN Guidelines® for Genetic/Familial High-Risk Assessment: Breast and Ovarian](http://www.nccn.org/professionals/physician_gls/pdf/genetics_screening.pdf)
http://www.nccn.org/professionals/physician_gls/pdf/genetics_screening.pdf
- [NCCN Guidelines® for Genetic/Familial High-Risk Assessment: Colorectal](http://www.nccn.org/professionals/physician_gls/pdf/genetics_colon.pdf)
http://www.nccn.org/professionals/physician_gls/pdf/genetics_colon.pdf

National Society of Genetic Counselors

- <http://www.nsgc.org/>

Centers for Disease Control and Prevention (CDC)

- [Inside Knowledge: Get the Facts About Gynecologic Cancer](http://www.cdc.gov/cancer/knowledge/provider-education/genetics/introduction.htm)
<http://www.cdc.gov/cancer/knowledge/provider-education/genetics/introduction.htm>
- [Colorectal Cancer Awareness](http://www.cdc.gov/genomics/resources/diseases/colorectal.htm)
<http://www.cdc.gov/genomics/resources/diseases/colorectal.htm>
- [Health Care Provider Education: HBOC CME Module](http://www.cdc.gov/cancer/breast/pdf/ACBCYW_HBOC_CME_3_28_14.pdf)
http://www.cdc.gov/cancer/breast/pdf/ACBCYW_HBOC_CME_3_28_14.pdf

American Cancer Society

- [Genetics and Cancer](http://www.cancer.org/cancer/cancercauses/geneticsandcancer/index)
<http://www.cancer.org/cancer/cancercauses/geneticsandcancer/index>

Nation Cancer Institute (NIH)

- [The Genetics of Cancer](http://www.cancer.gov/about-cancer/causes-prevention/genetics)
<http://www.cancer.gov/about-cancer/causes-prevention/genetics>

Faculty Bio for Carol A. Rosenberg, MD, FACP

Carol A. Rosenberg, MD, FACP, is the Founder and Program Director of the Living in the Future (LIFE) Cancer Survivorship Program at NorthShore University HealthSystem (NorthShore) of Illinois; a 4 hospital health system in greater Chicagoland and its Northern and Northwestern Suburbs. She implemented the LIFE Program in 2006 with a community education grant from the LIVESTRONG Foundation and has sustained and evolved the program with multiple additional grant awards from other philanthropic agencies as well as institutional support. www.northshore.org/LIFE. Dr. Rosenberg is NorthShore's Director of Preventive Health Initiatives, a board certified internist, a Fellow of the American College of Physicians and an clinical associate professor of medicine at the University Of Chicago Pritzker School Of Medicine. <http://www.northshore.org/kellogg-cancer-center/support-services/survivorship/program-director/>

Dr. Rosenberg has served the NorthShore University HealthSystem community for over 30 years as a clinician, medical educator, and administrative physician while holding an active position in national women's health clinical research. She served as a Principal Investigator, Clinical Medical Director and a Lead Investigator for the landmark Women's Health Initiative Study from the National Institute of Health wherein she designed, directed and authored original investigations regarding second cancer risk in women.

Dr. Rosenberg created the first regional health professional curriculum regarding the science of survivorship and is the creator, author and principal provider of the "Living in the Future Survivorship Course" a curriculum targeting internal medicine and family medicine post graduate resident trainees. The curriculum is a framework for the dissemination of the science of survivorship and provides emerging health professionals as well as those in long standing practice, with a foundation of knowledge, attitudes and skills related to survivorship care. Dr. Rosenberg is the author of the *NorthShore Living in the Future (LIFE) Cancer Survivorship Manual: A Resource for Healthcare Professionals Involved with Late Treatment or Post Treatment Cancer Survivors*. www.northshore.org/LIFE-ed

Dr. Rosenberg also serves as a regional Liaison for Adult Healthcare Resources for childhood cancer survivors, and is on the consulting staff of Ann and Robert H. Lurie Children's Hospital in Chicago.

For additional information:

<http://www.northshore.org/kellogg-cancer-center/support-services/survivorship/program-director/>

<http://www.ncbi.nlm.nih.gov/sites/myncbi/collections/bibliography/48985355/>

Faculty Bio for Shelly S. Lo, MD

Shelly S. Lo, MD Director, Cancer Risk Assessment and Prevention Clinic, Loyola University Medical Center and is a medical oncologist specializing in breast cancer and GI malignancies. She is an associate medical director for Loyola Hospice. She is board certified in Medical Oncology and Hospice and Palliative Care.

For additional information:

<https://www.loyolamedicine.org/doctor/shelly-lo>

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Question 1

Reasons to perform genetic testing on a cancer patient include all of the following except:

Please choose from the following answers:

- A. To provide information about risk for new cancers
- B. To impact medical management and surveillance
- C. To provide information for at-risk family members
- D. To provide information about recurrence risk

Question 1 – Answer

The answer is D, to provide information about recurrence risk.

Reasons to perform genetic testing in a cancer patient include:

- Provides information about risk for new cancers
- Impacts medical management and surveillance such as prophylactic surgery, more frequent screenings, or chemoprevention opportunities
- Provides information for at risk family members.
- Genetic testing does **not** provide information about recurrence risk. Recurrence risk is determined by stage and grade of the tumor.

Question 2

The medical management for the breast cancer survivor with a BRCA mutation may include:

Please choose from the following answers:

- A. Prophylactic mastectomy
- B. Addition of yearly screening MRI and mammography in women with remaining breast tissue
- C. Risk-reducing bilateral salpingo-oophorectomy and a consideration for a total abdominal hysterectomy
- D. All of the above

Question 2 – Answer

The answer is D, all of the above.

In breast cancer survivors with BRCA mutations, the medical management is directed towards prevention of contralateral or second primary breast cancer.

Therefore, prophylactic mastectomy versus screening MRI in addition to mammography are options. Ovarian cancer risk is addressed with an option of prophylactic bilateral salpingo-oophorectomy and a consideration for additional total abdominal hysterectomy. Screening for ovarian cancer is not effective.

Question 3

The medical management for the colon cancer survivor with Lynch Syndrome may include:

Please choose from the following answers:

- A. Yearly colonoscopies
- B. Prophylactic colectomy at the time of diagnosis
- C. If female, prophylactic bilateral salpingo-oophorectomy and total abdominal hysterectomy
- D. Regular screening for cancers of the stomach, urinary tract, and hepatobiliary tract
- E. A, B, and C

Question 3 – Answer

The answer is E: A, B, and C

The colon cancer survivor with Lynch Syndrome is at risk for new/metachronous colon cancer, and early colonoscopies reduce the incidence by 50%. Prophylactic colectomy at the time of diagnosis may also be advised. In females, there is a risk for uterine and ovarian cancer, and prophylactic bilateral salpingo-oophorectomy **and** total abdominal hysterectomy may be a consideration. Regular screening for other cancers is controversial, as there are no standardized protocols for such screening.