

Coleman Supportive Oncology Initiative

Survivorship Training Module

Topic: **Prevention and Cancer Screening**

Presenters: Patricia Robinson, MD and Frank J. Penedo, PhD
Updated by Christine B. Weldon, MBA and Betty Roggenkamp, BA

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:**
 - Stop Smoking and/or Smokeless tobacco
 - Sun avoidance
 - Diet modification
 - Healthy BMI / Weight
 - Physical activity, including aerobic, strength/resistance and stretching/yoga
 - 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 45.
- 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 including weight/resistance training and stretching**
- **Maintain a healthy diet**
- **Minimize alcohol intake**
- **Stop use of 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>

References

American Cancer Society. <http://www.cancer.org>. Accessed 01/14/2016; and accessed 6/28/2018:
<https://www.cancer.org/health-care-professionals/american-cancer-society-prevention-early-detection-guidelines/colorectal-cancer-screening-guidelines.html>

<https://www.cancer.org/health-care-professionals/american-cancer-society-prevention-early-detection-guidelines/colorectal-cancer-screening-guidelines.html>

Loprinzi CL. (2015) American Society of Clinical Oncology-Self Evaluation Program (ASCO-SEP®), Medical Oncology Self-Evaluation Program, 4th Edition. <http://university.asco.org/asco-sep%C2%AE-fourth-edition>. Accessed 01/14/2016.

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

National Comprehensive Cancer Network®. NCCN Guidelines® for Survivorship, Version 1.2018. http://www.nccn.org/professionals/physician_gls/pdf/survivorship.pdf.

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 surveillance

- 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 members

- 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

The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) Genetic/Familial High-Risk Assessment: Breast and Ovarian (Version 2.2019). © 2018 National Comprehensive Cancer Network, Inc. Available at: NCCN.org. Accessed August 28, 2018.

The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) Genetic/Familial High-Risk Assessment: Colorectal (Version 1.2018). © 2018 National Comprehensive Cancer Network, Inc. Available at: NCCN.org. Accessed August 28, 2018.

[Centers for Disease Control – Family Health Risk Categories](#)

BRCA-Related Breast and/or Ovarian Cancer Syndrome

- **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
 - Melanoma
- **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 upon completion of childbearing
 - CA-125 and vaginal US at the clinician's discretion 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

Genetic/Familial High Risk Assessment Colorectal Overview

- **Well established gene mutations that may confer a risk for colorectal cancer:¹**
 - MLH1, MSH2, MSH6, MUTYH, PTEN, SMAD4, STK11, TP53, APC, APC I1307K, BMPR1A, EPCAM and PMS2*
- **Lynch Syndrome Associated cancers:**
 - Most common: colon, uterine, gastric, ovarian, prostate
 - Others: urothelial, hepatobiliary, renal, small bowel, central nervous system, breast, pancreatic
- **Lynch Syndrome Expressivity in women:**
 - Endometrial and ovarian cancer are often the primary cancer in women with Lynch Syndrome²
 - Later mean age of colon cancer than men (60 vs. 55)

****Note, the list of established gene mutations is evolving, please check the current version of the NCCN Guidelines® for an updated list***

¹ The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) Genetic/Familial High-Risk Assessment: Colorectal (Version 1.2018). © 2018 National Comprehensive Cancer Network, Inc. Available at: NCCN.org. Accessed August 28, 2018.

² Lu KH, Daniels M., 2013..

Impact on Medical Management for the Cancer Patient with Lynch Syndrome

■ Colon Cancer Patient

- Risk for new/metachronous colon cancer:
 - Yearly colonoscopy^{1,2}
 - Consider prophylactic colectomy at the time of diagnosis²
- If female, risk for uterine and ovarian cancer:
 - Consider prophylactic TAH/BSO at completion of childbearing²
 - Dysfunctional uterine bleeding warrants evaluation¹
- Breast cancer: screening as followed by average risk population³
- Gastric and small bowel:
 - Select individuals may consider upper GI endoscopy every 1-3 yrs²
- Urothelial cancer: Consider annual urine cytology if MSH2 mutation³
- Pancreatic cancer: No screening recommendations are available³

■ Uterine and Ovarian Cancer patients

- Risk for colon cancer:
 - Yearly colonoscopies starting age 25¹

¹ Stoffel EM, 2015;

² Stoffel EM, Mangu PB, Gruber, SB et al., 2015;

³ The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) Genetic/Familial High-Risk Assessment: Colorectal (Version 1.2018). © 2018 National Comprehensive Cancer Network, Inc. Available at: NCCN.org. Accessed August 28, 2018.

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.

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>

References

- Domcheck SM, Friebel TM, Singer CF, et al. Association of risk reduction surgery in BRCA1 and BRCA2 mutation carriers with cancer risk and mortality. *JAMA* 2010;304:967-975.
- Khatcheressian JL, Jurley P, Bantig E et al. Breast cancer follow-up and management after primary treatment: American Society of Clinical Oncology clinical practice guideline update. *J Clin Oncol* 2013;31:961-965.
- Kauff ND, Domcheck SM, Friebel TM, et al. Risk reducing salpingo-oophorectomy for the prevention of BRCA1 and BRCA2 associated breast and gynecologic cancer: a multicenter, prospective study. *J Clin Oncol* 2008;26:1331-1337.
- Lu KH, Daniels M., Endometrial and ovarian cancer in women with Lynch syndrome: update in screening and prevention. *Fam Cancer*. 2013 Jun;12(2):273-7. doi: 10.1007/s10689-013-9664-5.
- National Comprehensive Cancer Network®. NCCN Guidelines®, NCCN Guidelines for Detection, Prevention, & Risk Reduction. Available at http://www.nccn.org/professionals/physician_gls/f_guidelines.asp#detection.
- National Comprehensive Cancer Network®. NCCN Guidelines® for Genetic/Familial High-Risk Assessment: Breast and Ovarian. Available at http://www.nccn.org/professionals/physician_gls/pdf/genetics_screening.pdf.
- National Comprehensive Cancer Network®. NCCN Guidelines® for Genetic/Familial High-Risk Assessment: Colorectal Available at http://www.nccn.org/professionals/physician_gls/pdf/genetics_colon.pdf.
- McCuaig, JM, et al. Comment in *Lancet Oncology*, (2010) doi:10.1016/S1470-2045(10)70246-1.
- Moyer VA: US Preventive Services Task Force. Risk assessment, genetic counseling and genetic testing for BRCA-related cancer in women: US Preventive Services Task Force recommendation statement. *Ann Intern Med* 2014; 160:271-281.
- Rosenberg, C. 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
- Stoffel EM. Screening for GI Cancer: The Role of Genetics. *J Clin Oncol* 2015;33:1721-1728.
- Stoffel EM, Mangu PB, Gruber, SB et al. Hereditary Colorectal Cancer Syndromes: American Society of Clinical Oncology Clinical Practice Guideline Endorsement of the Familial Risk-Colorectal Cancer: European Society for Medical Oncology Clinical Practice Guidelines. *J Clin Oncol* 2015;33:209-217.