

Clinical Principles for Cancer Prevention Algorithms

The Priorities Wizard© uses algorithms to create clinical decision support for diabetes, prediabetes, cardiovascular risk factors, and cancer prevention. **This document explains how the cancer prevention algorithms work within the Priorities Wizard.**

I. GENERAL INFORMATION ABOUT PRIORITIES WIZARD© DATA EXCHANGE AND THE BEST PRACTICE ALERT (BPA)

1. Selective EHR Information is automatically sent to the Wizard web service for when the following criteria are met:
 - a. Patient office encounter in a primary care department (Family Practice, Internal Medicine)
AND
 - b. Patient age 18-75 inclusively AND
 - c. A BP is taken at the encounter and vital section closed

2. The Wizard web service will present a best practice alert (BPA) pop up to rooming staff recommending use of the Wizard if the patient qualifies for any of the following cancer prevention needs:
 - a. **BREAST CANCER SCREENING is overdue**
 - b. **CERVICAL CANCER SCREENING is overdue**
 - c. **COLORECTAL CANCER SCREENING is overdue**
 - d. **LUNG CANCER SCREENING may be indicated and is overdue**
 - e. **HPV Vaccination is indicated**
 - f. **Patient is a current smoker**

3. The Wizard web service algorithm will suppress the BPA from appearing to rooming staff if the patient has any of the following conditions:
 - a. Pregnancy (pregnancy, abortion codes, or receiving prenatal care) in prior 12 months
 - b. Active cancer – Three or more diagnostic codes for cancer (excluding non-melanoma skin cancer) in the last year
 - c. Hospice care in the last two years (based on ICD10 codes)

4. The recommended workflow for viewing and printing Priorities Wizard is as follows:
 - a. If the BPA pops up for rooming staff recommending the Priorities Wizard be used, it will contain a link to display Wizard
 - b. The nurse or rooming assistant clicks on a URL link within the BPA. Wizard displays inside the EHR within approximately 1 second. Both the patient and clinician versions can be printed by a single click on the display's print button.

- c. A clinician can click on the **Wizard tab in the visit navigator** for any patient age 18-75 to view the Wizard in **Wizard Active Guideline** mode. Clinicians can print the provider and patient tools from the active guideline view. The active guideline contains orders that can be clicked on to create orders for medications, labs, procedures, and referrals suggested by the Wizard for the patient. When orders in the active guideline are clicked, the default orders appear in a shopping cart format on the right side of the active guideline screen. When the provider is finished selecting all orders, they can click on ACCEPT once to populate all orders in EPIC's order entry format where they can reviewed and edited before signing.

II. PRIORITIZING CANCER SCREENING

In Priorities Wizard, the cancer needs are prioritized right along with any sub-optimally controlled diabetes or CV risk factors (lipids, BP, BMI, tobacco, and aspirin use). Wizard prioritizes among the diabetes and cardiovascular risk factors by calculating the patient's absolute reversible risk (ARR) if the person were to achieve goal for each risk factor and ranking them in order of the greatest potential benefit to the patient to the least. For Priorities Wizard, the patient is also assigned an absolute reversible risk of 3% for each cancer prevention overdue. The net effect of this is to make cancer prevention one of the top priorities if the patient is overdue based on Wizard's evidence based algorithms (described below).

III. BREAST CANCER ALGORITHMS

1. Breast cancer screening will be one of the top priorities for all women age 50-75 who are of average breast cancer risk and 2 or more years overdue for a mammogram (based on the 2016 USPSTF recommendations).
2. If an EPIC health maintenance alert (HMA) for mammography has been documented for the individual or modified to yearly, Wizard will use this information to provide a recommendation to the patient that they are due or overdue for a mammogram. However, a BPA will not pop up for rooming staff to use Wizard in if they are average risk and have had a mammogram in the last 2 years.
3. For women with a history of breast cancer (LCIS, DCIS, or mastectomy) or for women at high risk determined by a positive BRCA 1 or 2 gene or ICD-10 code on the problem list, the Wizard will indicate a need for an individualized approach to breast cancer screening and treatment. Wizard clinical decision support is not intended for high risk situations that require individualization, and the BPA will not appear for rooming staff if these high risk situations are identified.
4. If not completed in the past, Wizard will recommend that women age 35-75 have a breast cancer risk assessment using the Breast Cancer Risk Assessment Tool (BCRAT) recommended by the National Cancer Institute. The BCRAT can be opened and completed with the patient from the Priorities Active Guideline display, and much of it will be auto-populated by Wizard to minimize the amount of data entry needed. After it is completed once, Wizard will not prompt you to do the BCRAT at subsequent encounters and the algorithms will use the score to recommend individualized screening approaches for patients with higher than average risk scores.

5. For women ages 35-49 with a 5-year BCRAT risk score of >2% or a lifetime risk of >16.8%, the Wizard algorithm will prompt the provider to set or modify the patients HMA to yearly mammograms if that has not already been done. Because many high risk patients are candidates for preventive treatment (e.g. tamoxifen/raloxifen), Wizard will look for preventive treatment medications in this situation if not found will prompt the provider to consider referring the patients for these treatment options.
6. For women >=50 and at average breast cancer risk, a BPA will display if mammography is due or overdue based on 2016 USPSTF guidelines as follows:

Patient Status	Goal Related Text for Clinician	Active Guideline Order	Goal related text for patient
No screening in last 24 months	Mammogram overdue	Order mammogram	You are overdue for a mammogram
No screening in last 21 months	Mammogram due	Order mammogram	You are due for a mammogram
History of breast cancer, lobular or ductal carcinoma, mastectomy	A history of breast cancer or high risk breast biopsy was identified	N/A	An individualized plan for breast cancer screening and prevention is recommended due to increased risk
BRCA 1 or 2 positive	A positive test for BRCA gene was identified	N/A	An individualized plan for breast cancer screening and prevention is recommended for you due to increased risk.

IV. CERVICAL CANCER ALGORITHMS

1. For women ages 21-65 who do not meet criteria for high risk (see below), the Wizard will check to see if a cervical cancer screening has been done within the recommended time frame of the USPSTF guideline as follows:
 - a. Age 21—29, PAP every 3 years
 - b. Age 30-65, PAP every 3 years OR PAP with HPV test every 5 years

If the patient is overdue based on these criteria, cancer prevention with a recommendation for cervical cancer screening will be one of the top priorities displayed on Wizard and the rooming staff will receive the BPA to use Wizard at the encounter. If the patient is due soon, this will be displayed on the Wizard as well but it will not trigger the BPA

2. Cervical cancer screening will not be recommended if a hysterectomy is identified.
3. The Wizard will also look for the following high risk criteria and recommend a more individualized approach if found:
 - a. Positive HIV condition on the problem list or 2 or more diagnosis codes
 - b. Immunocompromised state such as Felty’s syndrome, rheumatoid arthritis, lupus, dermatopolymyositis, systemic sclerosis, complications due to organ transplants,

hypogammaglobinemia, and other immunodeficiency conditions- identified by problem list codes or 2 or more diagnosis codes

- c. Women with CIN 2 or 3 or HPV condition identified by problem list codes or 2 or more diagnosis codes
 - d. History of cervical cancer identified by problem list codes or 2 or more diagnosis codes
4. The following table shows the text that appears on the provider and patient Wizard tools as well as the orders that will appear on the Active Guideline:

Patient Status	Goal Related Text for Clinician	Active Guideline Order	Goal related text for patient
No screening in last 3 years	Pap smear overdue	Order Pap smear	You are overdue for a Pap smear
No screening in last 31 months	Pap smear due	Order Pap smear	You are due for a Pap smear
High risk	Women with [condition] are at high risk for developing cervical cancer. Pap is recommended on a more frequent basis.	Schedule a Pap or refer to gynecology	An individualized plan for cervical cancer screening and prevention is recommended due to risk factors identified
History of cervical cancer	History of cervical cancer	N/A	History of cervical cancer identified
Hysterectomy	Based on risk factors identified, a Pap test is recommended despite history of hysterectomy	Schedule a Pap or refer to gynecology	A Pap test may be recommended for you despite your history of hysterectomy

V. COLORECTAL CANCER ALGORITHMS

1. For patients 50-75 years not found to be at higher risk of colorectal cancer or, Wizard will check to see if the patient has had colorectal cancer screening completed as recommended by the 2016 USPSF guideline. Wizard will look for the following screening tests and frequency;

- a. FIT or FIT-DNA (ColoGuard). If results are found and are positive, Wizard will recommend colonoscopy.
- b. Colonoscopy in the last 10 years.
- c. Sigmoidoscopy in the last 5 years.
- d. Patients age 40-75 with documented family history or polyps on a previous colonoscopy, colonoscopy every 5 years.

Patients not meeting these criteria are assigned a high priority for cancer prevention with a colon cancer screening recommendation and a BPA will appear for the rooming staff to print the Wizard tools. Colon cancer will similarly be assigned a high priority if the patient has a personal history of polyps on a previous colonoscopy or a family history of familial adenomatous polyps.

2. Patients with total colectomy are excluded from the colorectal cancer algorithms.

3. The Wizard will check to see if a colon cancer screening HMA has been previously documented. If a plan is identified, the Wizard will display reminders based on their due date according to HMA.
4. For women and men between ages 18-75, the Wizard will assess for high colon cancer risk and provide a brief statement on the provider and patient print out as well as the active guideline view if a one is identified. If high risk conditions are identified and the patient has not had a colonoscopy in the last 2.5 years, a recommendation to consider referral for colonoscopy will display. High risk includes;
 - a. History of colorectal cancer or polyps based on problem list codes or 2 or more diagnosis codes
 - b. Ulcerative Colitis based on problem list codes or 2 or more diagnosis codes
 - c. Crohn's disease based on problem list codes or 2 or more diagnosis codes
5. The following text will display on Wizard:

Patient Status	Goal Related Text for Clinician	Active Guideline Order	Goal related text for patient
Age 18-75 with history of colorectal cancer	An individualized plan for colorectal cancer screening is recommended due to history of colorectal cancer or polyps	N/A	A history of colorectal cancer is identified
Age 18-75 with history of Chronic Ulcerative Colitis	Increased risk for colorectal cancer has been identified	N/A	Increased risk for colorectal cancer has been identified
Age 18-75 with history of Crohn's Disease	Increased risk for colorectal cancer has been identified	N/A	Increased risk for colorectal cancer has been identified
Age 18-75 with high risk and no colonoscopy in last 2.5 years	Colonoscopies are often recommended every 2 years or less in patients with a history or are at very high risk of colorectal cancer	Consider ordering colonoscopy	Talk to your doctor about colon cancer screening
Age 40-75 with history of colorectal polyps or 1 st degree family history of polyps and no colonoscopy in last 5 years	Colonoscopies are recommended every 5 years or less in patients with a history of adenomatous polyps or 1 st degree relative with colon cancer	Order colonoscopy	Talk to your doctor about colon cancer screening
Age 50-75 with a positive FIT or FIT DNA (ColoGuard) test in the last year and no colonoscopy in last year	This patient has a positive FIT test within the last year. A colonoscopy is usually recommended to rule out colon cancer	Order colonoscopy	Talk to your doctor about colon cancer screening

Age 50-75 with no procedure for sigmoidoscopy in the last 5 years or colonoscopy in the last 10 years	Colon cancer screening is recommended. Discuss options with patient	Order FIT, FIT DNA, or colonoscopy	Discuss options with your doctor
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VI. LUNG CANCER ALGORITHMS

1. For women and men ages 55-75 who are current or past smokers with a 30 pack year history of smoking (or if pack years are not documented), Wizard will look to see if a low dose CT scan has been done in the last year. If not, cancer prevention with consideration of lung cancer screening is one of the top priorities displayed on Wizard and the rooming staff will receive the BPA to use Wizard at the encounter.
2. Wizard will not recommend lung cancer screening if a previous dx of lung cancer is identified.
3. Documenting pack years in EPIC will help Wizard to know if the patient meets criteria for lung cancer screening. If low dose CT is suggested, the screening questions including the pack years must be completed as part of the ordering process to make sure that the procedure will be covered by insurance.
4. For additional information about smoking, see smoking algorithm in cv wizard principles document.

Patient Status	Goal Related Text for Clinician	Active Guideline Order	Goal related text for patient
Age 55-75 with history of lung cancer	A past history of lung cancer is identified	N/A	A past history of lung cancer is identified
Age 55-75, quit smoking but quit years not documented	Patient is former smoker. If quit less than 15 years ago, low dose CT may be indicated to screen for lung cancer	Order low dose CT to screen for lung cancer. The order then requires completion of questions for reimbursement	Discuss the pros and cons of low dose CT for lung cancer screening with your doctor
Age 55-75, current smoker and pack years not documented in EMR	Patient is an active smoker. If the pack years are ≥ 30 , low dose CT may be indicated to screen for lung cancer	Complete CT chest low dose screening questions and order low dose CT for lung cancer screening	Discuss the pros and cons of low dose CT for lung cancer screening with your doctor
Age 55-75, current smoker and pack years documented	Patient is an active smoker with ≥ 30 pack years. Low dose CT may be indicated to screen for lung cancer	Order low dose CT	Because of your past history of smoking, please talk to your doctor about the possibility of lung cancer screening.

VII. HPV VACCINE

1. For adolescents and teens ages 9-18, a separate BPA independent of the Wizard BPA will trigger if the patient is not up to date on HPV vaccinations.
 - a. For patients <15 and <2 shots recorded, based on CPT codes
 - b. For patients 15-17 and <3 shots recorded based on CPT codes
2. For patients 18-26, the Wizard will assess for 3 HPV vaccinations based on CPT codes. If <3 shots are identified, a BPA will trigger recommending the Wizard.

Patient Status	Goal Related Text for Clinician	Active Guideline Order	Goal related text for patient
Age 18-26 and <3 HPV shots	Patient may need next series of HPV vaccine	Order HPV vaccine	You may be due for HPV vaccine. Talk to your doctor