

ONCOLOGY: CYTOGENETIC TESTING

OVERVIEW

Cytogenetic analysis of solid tumors and hematologic malignancies aims to both classify the type of tumor or cancer present and also to identify somatic oncogenic mutations in cancer. These mutations, often called “driver” mutations, are becoming increasingly useful for targeted therapy selection, and may give insight into prognosis and treatment response in a subset of cancers. In addition, molecular analysis of solid tumors and hematologic malignancies, in particular, can also aid in making a diagnosis of a specific type of malignancy. For solid tumors, molecular analysis can be performed via direct testing of the tumor (which is addressed in this policy) or via circulating tumor DNA or circulating tumor cells (CTCs) (see Other Related Policies). For hematologic malignancies, molecular analysis can be performed on blood samples or bone marrow biopsy samples (skin or buccal cells/saliva is occasionally used in patients who have received a hematopoietic stem cell transplant).

POLICY REFERENCE TABLE

Below is a list of higher volume tests and the associated laboratories for each coverage criteria section. This list is not all inclusive.

| Coverage Criteria Sections | Example Tests (Labs) | Common CPT Codes | Common ICD Codes | Ref |
|--|---|---------------------|---------------------------------|---------------------|
| Tumor Specific ALK Gene Rearrangement (Qualitative FISH and PCR) Tests | ALK Gene Rearrangements (LabCorp) | 88271, 88274, | C34, C73 | 1, 4 |
| Tumor Specific BCR/ABL Gene Rearrangement (Qualitative FISH and PCR) Tests | Detection by FISH of t(9;22) BCR/ABL (CGC Genetics) | 88271, 88275, 88291 | C91.00-C91.02, | 7, 8, 9, 10, 11 |
| | BCR/ABL t(9;22) (NeoGenomics Laboratories) | 88374 | C92.0-C92.12, D45, D47.1, D47.3 | |
| | BCR ABL Qualitative RT PCR (Cincinnati Children’s Hospital) | 81206, 81207, 81208 | | |
| Bladder Cancer Diagnostic and | UroVysion® FISH (ARUP Laboratories) | 88120, 88121 | C67.0-C67, D09.0, | 16, 19 |

| | | | | |
|---|--|--------------|---|--|
| Recurrence FISH Tests | | | D49.4, R31.9, Z85.51 | |
| Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma (CLL/SLL) FISH Panel Analysis | FISH CLL Panel, Blood (Johns Hopkins Medical Institutions - Pathology Laboratory) | 88271, 88275 | C91, C94, C95, Z85.6 | 12 |
| | FISH, B-Cell Chronic Lymphocytic Leukemia Panel (Quest Diagnostics) | | | |
| Tumor Specific ERBB2 (HER2) Deletion/Duplication (FISH and CISH) | ERBB2 (HER2/neu) Gene Amplification by FISH with Reflex, Tissue (ARUP Laboratories) | 88360, 88377 | C08, C15, C16, C18, C19, C20, C50 | 2, 5, 6, 13, 14 |
| Multiple Myeloma FISH Panel Analysis | Multiple Myeloma Panel by FISH (ARUP Laboratories) | 88271, 88275 | C90 | 15, 18 |
| | FISH Profile Multiple Myeloma, Bone Marrow (Johns Hopkins Medical Institutions - Pathology Laboratory) | | | |
| NTRK Sequencing Panel | NTRK 1, 2, 3 FISH Panel (NeoGenomics) | 88374, 88377 | C15, C16, C18, C34, C49.9, C50, C51, C53, C54, C73, C80.1, C91 | 1, 2, 3, 4, 5, 6, 11, 13, 17, 20, 21, 22 |
| Tumor Specific PD-L1 Protein Analysis Fusion | PD-L1, IHC with Interpretation (Quest Diagnostics) | 88360 | C11, C15, C16, C34, C50, C51, C53, C67 | 1, 3, 5, 6, 13, 14, 16, 17 |
| Tumor Specific PML/RARA Gene Rearrangement (Qualitative FISH and PCR) | FISH, AML M3, PML/RARA, Translocation 15, 17 (Quest Diagnostics) | 88271, 88275 | C91-C95 | 7 |
| Tumor Specific ROS1 Gene Rearrangement | FISH ROS1 Rearrangement (Johns Hopkins Medical Institutions-Pathology Laboratory) | 88271, 88274 | C34 | 1 |

OTHER RELATED POLICIES

This policy document provides coverage criteria for ONCOLOGY: CYTOGENETIC TESTING. Please refer to:

- **Oncology: Molecular Analysis of Solid Tumors and Hematologic Malignancies** for criteria related to DNA testing of a solid tumor or a blood cancer.
- **Genetic Testing: Hereditary Cancer Susceptibility Syndromes** for coverage criteria related to genetic testing for hereditary cancer predisposition syndromes.
- **Oncology: Cancer Screening** for coverage criteria related to the use of non-invasive fecal, urine, or blood tests for screening for cancer.
- **Oncology: Circulating Tumor DNA and Circulating Tumor Cells (Liquid Biopsy)** for criteria related to circulating tumor DNA (ctDNA) or circulating tumor cell testing performed on peripheral blood for cancer diagnosis, management and surveillance.
- **Oncology: Algorithmic Testing** for coverage criteria related to gene expression profiling and tumor biomarker tests with algorithmic analyses.
- **Genetic Testing: Exome and Genome Sequencing for the Diagnosis of Genetic Disorders** for coverage criteria related to whole genome and whole exome sequencing in rare genetic syndromes.
- **Genetic Testing: General Approach to Genetic Testing** for coverage criteria related to cytogenetic testing in oncology that is not specifically discussed in this or another non-general policy.

COVERAGE CRITERIA

Tumor Specific *ALK* Gene Rearrangement (Qualitative FISH and PCR) Analysis

- I. Somatic *ALK* rearrangement analysis (88271, 88274) in solid tumors is considered medically necessary when:
 - A. The member has a diagnosis of or is in the initial work up stage for:

1. [Advanced](#) or metastatic lung adenocarcinoma, **OR**
2. [Advanced](#) or metastatic large cell lung carcinoma, **OR**
3. [Advanced](#) or metastatic squamous cell lung carcinoma, **OR**
4. [Advanced](#) or metastatic non-small cell lung cancer (NSCLC) not otherwise specified (NOS), **OR**
5. Anaplastic thyroid carcinoma.

[back to top](#)

Tumor Specific *BCR/ABL* Gene Rearrangement (Qualitative FISH and PCR) Test

- I. Somatic *BCR/ABL1* rearrangement analysis via fluorescent in situ hybridization (FISH) (88271, 88274, 88275, 88291) or PCR (81206, 81207, 81208) in peripheral blood or bone marrow is considered **medically necessary** when:
 - A. The member is suspected to have a myeloproliferative neoplasm (i.e., polycythemia vera, essential thrombocythemia, primary myelofibrosis, chronic myeloid leukemia), **OR**
 - B. The member is undergoing diagnostic workup for:
 1. Acute lymphoblastic leukemia (ALL), **OR**
 2. Acute myeloid leukemia (AML), **OR**
 3. Chronic myelogenous leukemia (CML)

[back to top](#)

Bladder Cancer Diagnostic and Recurrence FISH Tests

- I. Bladder cancer diagnostic and recurrence FISH tests (88120, 88121) for the screening, diagnosis of, and monitoring for bladder cancer are considered **investigational**.

[back to top](#)

Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma (CLL/SLL) FISH Panel Analysis

- I. Chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL) FISH panel analysis (88271, 88275) in peripheral blood or bone marrow is considered **medically necessary** when:
 - A. The panel includes analysis for +12, del(11q), del(13q), and del(17p), **AND**
 - B. The member is undergoing initial diagnostic workup for chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL).

[back to top](#)

Tumor Specific *ERBB2* (*HER2*) Deletion/Duplication (FISH and CISH)

- I. Somatic *ERBB2* (*HER2*) amplification analysis via in situ hybridization (ISH) (examples: FISH or CISH) (88360, 88377) in solid tumors is considered medically necessary when:
 - A. The member has any of the following:
 1. Recurrent or newly diagnosed stage I-IV invasive breast cancer, **OR**
 2. Suspected or proven metastatic gastric cancer, **OR**
 3. Suspected or proven metastatic, synchronous or metachronous colorectal cancer or documented metachronous metastases by CT, MRI and/or biopsy, **OR**
 4. Suspected or proven metastatic esophageal and/or esophagogastric junction adenocarcinoma, **OR**
 5. Metastatic salivary gland tumors with distant metastases.

[back to top](#)

Multiple Myeloma FISH Panel Analysis

- I. Multiple myeloma FISH panel analysis (88271, 88275) in bone marrow is considered medically necessary when:
 - A. The panel includes analysis for del(13), del(17p13), t(4;14), t(11;14), t(14;16), t(14;20), 1q21 gain/amplification, del(1p), **AND**
 - B. The member is undergoing initial diagnostic workup for multiple myeloma.

[back to top](#)

NTRK Sequencing Panel

- I. Somatic *NTRK 1/2/3* fusion analysis (88377) via fluorescent in situ hybridization (FISH) or immunohistochemistry (IHC) in solid tumors is considered medically necessary when:
 - A. The member is undergoing initial diagnostic workup for or has a diagnosis of:
 1. [Advanced](#) or metastatic lung adenocarcinoma, **OR**
 2. [Advanced](#) or metastatic large cell lung carcinoma, **OR**
 3. [Advanced](#) or metastatic squamous cell lung carcinoma, **OR**
 4. [Advanced](#) or metastatic non-small cell lung cancer (NSCLC) not otherwise specified (NOS), **OR**
 5. Unknown primary cancers, **OR**
 6. [Advanced](#) or metastatic colorectal cancer, **OR**
 7. Recurrent, progressive or metastatic cervical cancer, **OR**
 8. Recurrent, progressive or metastatic vulvar cancer, **OR**
 9. Recurrent or metastatic uterine cancer or a diagnosis of uterine sarcoma, **OR**
 10. Recurrent or stage IV invasive breast cancer, **OR**

11. Locally [advanced](#), recurrent or metastatic gastric cancer, **OR**
12. Locally [advanced](#), recurrent or metastatic esophageal cancer, **OR**
13. Anaplastic thyroid carcinoma or locally recurrent, [advanced](#) and/or metastatic papillary, follicular or Hurthle cell thyroid carcinoma, **OR**
14. Pediatric acute lymphoblastic leukemia (ALL), **OR**
15. Soft tissue sarcoma, **AND**
 - a) Previous tumor testing was negative for *KIT* and *PDGFRA* somatic mutations.

[back to top](#)

Tumor Specific *PD-L1* Protein Analysis Fusion

- I. *PD-L1* protein expression analysis via immunohistochemistry (IHC) (88360) in solid tumors is considered medically necessary when:
 - A. The member has a diagnosis of or is in the initial work up stage for:
 1. [Advanced](#) or metastatic lung adenocarcinoma, **OR**
 2. [Advanced](#) or metastatic large cell lung carcinoma, **OR**
 3. [Advanced](#) or metastatic squamous cell lung carcinoma, **OR**
 4. [Advanced](#) or metastatic non-small cell lung cancer (NSCLC) not otherwise specified (NOS), **OR**
 5. Locally [advanced](#) or metastatic bladder cancer, **OR**
 6. Recurrent, progressive, or metastatic cervical cancer, **OR**
 7. Recurrent or stage IV triple negative breast cancer, **OR**
 8. Suspected or proven metastatic esophageal and/or esophagogastric junction adenocarcinoma, **OR**
 9. Suspected or proven metastatic gastric cancer, **OR**
 10. Recurrent, unresectable, or metastatic nasopharyngeal cancer, **OR**
 11. Recurrent, progressive or metastatic vulvar cancer.

Note: PD-L1 protein expression analysis via IHC is often performed as an adjunct component of comprehensive molecular profiling panels for solid tumors

[back to top](#)

Tumor Specific *PML/RARA* Gene Rearrangement (Qualitative FISH and PCR)

- I. *PML/RARA* rearrangement analysis via fluorescent in situ hybridization (FISH) (88271, 88275) in peripheral blood or bone marrow is considered medically necessary when:
 - A. The member is undergoing initial diagnostic work up for acute leukemia.

[back to top](#)

Tumor Specific *ROS1* Gene Rearrangement

- I. Somatic *ROS1* rearrangement analysis via fluorescent in situ hybridization (FISH) (88271, 88274) in solid tumors is considered medically necessary when:
 - A. The member has a diagnosis of:
 1. [Advanced](#) or metastatic lung adenocarcinoma, **OR**
 2. [Advanced](#) or metastatic large cell lung carcinoma, **OR**
 3. [Advanced](#) or metastatic squamous cell lung carcinoma, **OR**
 4. [Advanced](#) or metastatic non-small cell lung cancer (NSCLC) not otherwise specified (NOS).

[back to top](#)

NOTES AND DEFINITIONS

Advanced cancer is cancer that is unlikely to be cured or controlled with treatment. The cancer may have spread from where it first started to nearby tissue, lymph nodes, or distant parts of the body. Treatment may be given to help shrink the tumor, slow the growth of cancer cells, or relieve symptoms.

BACKGROUND AND RATIONALE

Tumor Specific ALK Gene Rearrangement (Qualitative FISH and PCR Tests)

National Comprehensive Cancer Network (NCCN)

The NCCN Thyroid Carcinoma guidelines (2.2022) recommend molecular diagnostic testing for evaluating FNA results that are suspicious for follicular cell neoplasms or AUS/FLUS and somatic *RET* testing in all individuals with newly diagnosed medullary thyroid carcinoma. Additionally they comment that molecular testing has shown to be beneficial when making targeted therapy decisions. The guideline also comments that individuals with anaplastic thyroid cancer and/or metastatic disease should undergo molecular testing including *BRAF*, *NTRK*, *ALK*, *RET*, MSI, dMMR, and tumor mutational burden if not previously done.

NCCN Non-Small Cell Lung Cancer guidelines (4.2022) recommend *ALK* rearrangement testing in patients with advanced or metastatic disease: Adenocarcinoma, Large Cell, Squamous cell, and NSCLC not otherwise specified (NOS).

Tumor Specific BCR/ABL Gene Rearrangement (Qualitative FISH and PCR) Tests

National Comprehensive Cancer Network (NCCN)

NCCN Acute Lymphoblastic Leukemia guidelines (1.2022) recommend *BCR/ABL* rearrangement analysis for patients for the diagnosis/workup of ALL.

NCCN Acute Myeloid Leukemia guidelines (2.2022) recommend *BCR/ABL* rearrangement analysis for patients for the evaluation of acute leukemia.

NCCN Pediatric Acute Lymphoblastic Leukemia guidelines (1.2022) recommend *BCR/ABL* rearrangement analysis for patients for the diagnosis/work-up of ALL.

NCCN Chronic Myeloid Leukemia guidelines (1.2023) recommend *BCR/ABL* rearrangement analysis for patients for the diagnosis/work-up of CML.

NCCN Myeloproliferative Neoplasms guidelines (3.2022) recommend *BCR/ABL* rearrangement analysis for patients during the workup of suspected MPN.

Bladder Cancer Diagnostic and Recurrence FISH Tests

National Comprehensive Cancer Network (NCCN)

NCCN Bladder Cancer guidelines (2.2022) do not currently recommend the use of bladder cancer diagnostic and recurrence FISH tests (e.g., Urovysion).

American Urological Association and Society of Urologic Oncology

The American Urological Association and Society of Urologic Oncology (2016) addressed the diagnosis and treatment of non-muscle-invasive bladder cancer, based on a systematic review and includes the following statements on the use of urine markers after the diagnosis of bladder cancer:

- “Urinary biomarker analysis should not replace cystoscopic evaluation in the surveillance of NMIBC.”
- “Urinary biomarker analysis or cytology should not routinely be used during surveillance in a patient with a history of low-risk cancer and a normal cystoscopy.”
- “Urinary biomarker analysis may be used to assess response to intravesical BCG (UroVysion® FISH) and adjudicate equivocal cytology (UroVysion® FISH and ImmunoCyt™) in a patient with NMIBC.”

Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma (CLL/SLL) FISH Panel Analysis

National Comprehensive Cancer Network (NCCN)

NCCN Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma guidelines (1.2023) recommend consideration of FISH testing for the rearrangements specified (at a minimum) during the diagnostic workup for CLL/SLL.

Tumor Specific ERBB2 (HER2) Deletion/Duplication (FISH and CISH)

National Comprehensive Cancer Network (NCCN)

NCCN Esophageal and Esophagogastric Junction Cancers guidelines (4.2022) recommend *ERBB2* testing during the workup of documented or suspected metastatic adenocarcinoma.

NCCN Head and Neck Cancers guidelines (2.2022) recommend *ERBB2* testing for therapeutic options for individuals diagnosed with recurrent, unresectable or metastatic salivary gland tumor.

NCCN Colon Cancer guidelines (1.2022) recommend *ERBB2* testing during the workup for suspected or proven metastatic, synchronous or metachronous colorectal cancer or documented metachronous metastases by CT, MRI and/or biopsy

NCCN Gastric Cancer guidelines (2.2022) recommend *ERBB2* testing during the workup of documented or suspected metastatic adenocarcinoma.

NCCN Breast Cancer guidelines (4.2022) recommend *ERBB2* testing during the workup of recurrent or newly diagnosed stage I-IV invasive breast cancer.

Multiple Myeloma FISH Panel Analysis

National Comprehensive Cancer Network (NCCN)

NCCN Multiple Myeloma guidelines (5.2022) recommend FISH testing during the initial workup of multiple myeloma for prognostic purposes.

American Society of Clinical Oncology (ASCO) and Cancer Care Ontario (CCO)

ASCO and Cancer Care Ontario (CCO) published a joint clinical practice guideline for the treatment of multiple myeloma (2019) that included the following:

- Recommendation 3.5. There is insufficient evidence to make modifications to maintenance therapy based on depth of response, including minimal residual disease (MRD) status (Type: informal consensus/evidence based; Evidence quality: low/intermediate, benefit outweighs harm; Strength of recommendation: moderate).
- Recommendation 4.2. The goal of initial therapy for transplant-eligible patients should be achievement of the best depth of remission. MRD-negative status has been associated with improved outcomes, but it should not be used to guide treatment goals outside the context of a clinical trial (Type: evidence based; Evidence quality: high, benefit outweighs harm; Strength of recommendation: moderate).
- Recommendation 8.2. Repeat risk assessment at the time of relapse should be performed and should include bone marrow with fluorescence in situ hybridization for myeloma abnormalities seen with progression, including 17p and 1q abnormalities. Fluorescence in situ hybridization for primary abnormalities (translocations and trisomies), if seen in the initial diagnostic marrow, does not

need to be repeated (Type: evidence based; Evidence quality: high, benefit outweighs harm; Strength of recommendation: strong).

NTRK Sequencing Panel

National Comprehensive Cancer Network (NCCN)

The NCCN Thyroid Carcinoma guidelines (2.2022) on thyroid carcinoma recommend molecular diagnostic testing for evaluating FNA results that are suspicious for follicular cell neoplasms or AUS/FLUS and somatic *RET* testing in all individuals with newly diagnosed medullary thyroid carcinoma. Additionally they comment that molecular testing has shown to be beneficial when making targeted therapy decisions. The guideline also comments that individuals with anaplastic thyroid cancer and/or metastatic disease should undergo molecular testing including *BRAF*, *NTRK*, *ALK*, *RET*, MSI, dMMR, and tumor mutational burden if not previously done.

The NCCN Colon Cancer guidelines (1.2022) recommends *NTRK* fusion analysis for patients with advanced or metastatic colorectal cancer.

The NCCN Non-Small Cell Lung Cancer guidelines (4.2022) recommends *NTRK* fusion analysis for patients with advanced or metastatic disease: Adenocarcinoma, Large Cell, Squamous cell, and NSCLC not otherwise specified (NOS)

The NCCN Occult Primary guidelines (1.2023) recommends *NTRK* fusion analysis for cancer of unknown primary.

The NCCN Cervical Cancer guidelines (1.2022) recommends *NTRK* fusion analysis for recurrent, progressive or metastatic cervical cancer.

The NCCN Vulvar Cancer guidelines (2.2022) recommends *NTRK* fusion analysis for recurrent, progressive or metastatic vulvar cancer.

The NCCN Uterine Neoplasms guidelines (1.2022) recommends *NTRK* fusion analysis for recurrent or metastatic uterine cancer or a diagnosis of uterine sarcoma.

The NCCN Breast Cancer guidelines (4.2022) recommends *NTRK* fusion analysis for recurrent or stage IV invasive breast cancer.

The NCCN Gastric Cancer guidelines (2.2022) recommends *NTRK* fusion analysis for locally advanced, recurrent or metastatic gastric cancer.

The NCCN Esophageal and Esophagogastric Junction Cancer guidelines (4.2022) recommends *NTRK* fusion analysis for locally advanced, recurrent or metastatic esophageal cancer.

The NCCN Pediatric Acute Lymphoblastic Leukemia guidelines (1.2022) recommends *NTRK* fusion analysis for pediatric acute lymphoblastic leukemia (ALL).

The NCCN Soft Tissue Sarcoma guidelines (2.2022) recommends *NTRK* fusion analysis for soft tissue sarcoma when previous tumor testing was negative for *KIT* and *PDGFRA* somatic mutations.

Tumor Specific PD-L1 Protein Analysis Fusion

National Comprehensive Cancer Network (NCCN)

The NCCN Gastric Cancer guidelines (2.2022) recommends *PD-L1* testing during the workup for documented or suspected metastatic adenocarcinoma.

The NCCN Head and Neck Cancers guidelines (2.2022) recommends *PD-L1* testing during the workup phase for cancer of the nasopharynx.

NCCN Bladder Cancer guidelines (2.2022) recommend *PD-L1* testing in individuals with locally advanced or metastatic (stage IV) bladder cancer.

The NCCN Vulvar Cancer guidelines (2.2022) recommends *PD-L1* testing for individuals with recurrent, progressive, or metastatic vulvar cancer.

The NCCN Esophageal and Esophagogastric Junction Cancers guidelines (4.2022) recommends *PD-L1* testing for individuals during the workup phase for documented or suspected metastatic esophageal and esophagogastric junction cancers.

The NCCN Cervical Cancer guidelines (1.2022) recommends *PD-L1* testing for individuals with recurrent, progressive, or metastatic cervical cancer.

NCCN Non-Small Cell Lung Cancer guidelines (4.2022) recommend *PD-L1* testing in patients with advanced or metastatic disease: Adenocarcinoma, Large Cell, Squamous cell, and NSCLC not otherwise specified (NOS).

The NCCN Breast Cancer guidelines (4.2022) recommends *PD-L1* testing for individuals with recurrent or stage IV triple negative breast cancer.

Tumor Specific PML/RARA Gene Rearrangement (Qualitative FISH and PCR)

National Comprehensive Cancer Network (NCCN)

NCCN Acute Myeloid Leukemia guidelines (2.2022) recommend *PML/RARA* rearrangement analysis for patients for the evaluation of acute leukemia.

Tumor Specific ROS1 Gene Rearrangement

National Comprehensive Cancer Network (NCCN)

NCCN Non-Small Cell Lung Cancer guidelines (4.2022) recommend *ROS1* rearrangement testing in patients with advanced or metastatic disease: Adenocarcinoma, Large Cell, Squamous Cell, and NSCLC not otherwise specified (NOS).

[back to top](#)

REFERENCES

1. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Non-Small Cell Lung Cancer. Version 4.2022. https://www.nccn.org/professionals/physician_gls/pdf/nscl.pdf
2. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Colon Cancer. Version 1.2022. http://www.nccn.org/professionals/physician_gls/PDF/colon.pdf
3. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Cervical Cancer. Version 1.2022. https://www.nccn.org/professionals/physician_gls/pdf/cervical.pdf
4. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Thyroid Carcinoma. Version 2.2022. https://www.nccn.org/professionals/physician_gls/pdf/thyroid.pdf
5. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Gastric Cancer. Version 2.2022. https://www.nccn.org/professionals/physician_gls/pdf/gastric.pdf
6. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Esophageal and Esophagogastric Junction Cancer. Version 4.2022. https://www.nccn.org/professionals/physician_gls/pdf/esophageal.pdf

7. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Acute Myeloid Leukemia. Version 2.2022.
https://www.nccn.org/professionals/physician_gls/pdf/aml.pdf
8. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Myeloproliferative Neoplasms. Version 3.2022
https://www.nccn.org/professionals/physician_gls/pdf/mpn.pdf
9. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Chronic Myeloid Leukemia. Version 1.2023.
https://www.nccn.org/professionals/physician_gls/pdf/cml.pdf
10. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Acute Lymphoblastic Leukemia. Version 1.2022.
https://www.nccn.org/professionals/physician_gls/pdf/all.pdf
11. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Pediatric Acute Lymphoblastic Leukemia. Version 1.2022.
https://www.nccn.org/professionals/physician_gls/pdf/ped_all.pdf
12. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Chronic Lymphocytic Leukemia/Small Lymphocytic Leukemia. Version 1.2023.
https://www.nccn.org/professionals/physician_gls/pdf/cli.pdf
13. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Breast Cancer. Version 4.2022.
https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf
14. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Head and Neck Cancers. Version 2.2022.
https://www.nccn.org/professionals/physician_gls/pdf/head-and-neck.pdf
15. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Multiple Myeloma. Version 5.2022.
https://www.nccn.org/professionals/physician_gls/pdf/myeloma.pdf
16. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Bladder Cancer. Version 2.2022.
https://www.nccn.org/professionals/physician_gls/pdf/bladder.pdf
17. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Vulvar Cancer (Squamous Cell Carcinoma). Version 2.2022. https://www.nccn.org/professionals/physician_gls/pdf/vulvar.pdf
18. Mikhael J, Ismaila N, Cheung MC, et al. Treatment of Multiple Myeloma: ASCO and CCO Joint Clinical Practice Guideline [published correction appears in J Clin Oncol. 2020 Jul 20;38(21):2469]. J Clin Oncol. 2019;37(14):1228-1263. doi:10.1200/JCO.18.02096
19. Chang SS, Boorjian SA, Chou R, et al. Diagnosis and treatment of non-muscle invasive bladder cancer: AUA/SUO Guideline. J Urol. 2016;196(4):1021-1029. doi:10.1016/j.juro.2016.06.049.

20. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Occult Primary (Cancer of Unknown Primary [CUP]). Version 1.2023. https://www.nccn.org/professionals/physician_gls/pdf/occult.pdf
21. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Uterine Neoplasms. Version 1.2022. https://www.nccn.org/professionals/physician_gls/pdf/uterine.pdf
22. National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Soft Tissue Sarcoma. Version 2.2022. https://www.nccn.org/professionals/physician_gls/pdf/sarcoma.pdf

[back to top](#)