

Comprehensive Cancer Biomarker Testing Program

As of January 1, 2024

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Ontario Health
Cancer Care Ontario

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Note: Effective January 1, 2024, all testing indications are funded for the adult and pediatric populations, unless otherwise specified. Central Nervous System (CNS) and Soft Tissue & Bone indications are currently undergoing review and are intended for the adult population.

Adrenal Gland

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed tumours with adrenal cortical carcinoma.	MLH1, MSH2, MSH6, PMS2	<ul style="list-style-type: none"> • Grand River Hospital • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Hospital for Sick Children (SickKids) • Kingston Health Sciences Centre • Lakeridge Health • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System • Dynacare

Bladder/Urothelial

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed tumours with advanced/metastatic urothelial carcinoma	FGFR2, FGFR3	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Hospital for Sick Children (SickKids) • Kingston Health Sciences Centre • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • University Health Network • William Osler Health System

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed tumours with upper tract (ureter/renal pelvis) urothelial carcinoma.	MLH1, MSH2, MSH6, PMS2	<ul style="list-style-type: none"> • Grand River Hospital • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • Lakeridge Health • London Health Sciences Centre • Markham Stouffville Hospital • Mount Sinai Hospital • North York General Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System • Dynacare

Breast

Testing Indication	Biomarkers	Testing Sites
Reflex testing on all newly diagnosed breast cancers.	ER, PR, HER2	<ul style="list-style-type: none"> • Grand River Hospital • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • Lakeridge Health • London Health Sciences Centre • Mount Sinai Hospital • North York General Hospital • Royal Victoria Regional Health Centre • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Thunder Bay Regional Health Sciences Centre • Trillium Health Partners - Credit Valley Site • Unity Health – St. Michael's Hospital • University Health Network • William Osler Health System • Windsor Regional Hospital

Testing Indication	Biomarkers	Testing Sites
Reflex testing on all newly diagnosed ductal carcinoma in situ (DCIS)	ER	<ul style="list-style-type: none"> • Grand River Hospital • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • Lakeridge Health • London Health Sciences Centre • Mount Sinai Hospital • North York General Hospital • Royal Victoria Regional Health Centre • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Thunder Bay Regional Health Sciences Centre • Trillium Health Partners - Credit Valley Site • Unity Health – St. Michael's Hospital • University Health Network • William Osler Health System • Windsor Regional Hospital
Testing on advanced/metastatic breast cancer where directed therapy is being considered	ESR1, PIK3CA	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Kingston Health Sciences Centre • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • University Health Network • William Osler Health System
Testing on locally recurrent unresectable or metastatic triple negative breast cancer (TNBC)	PD-L1	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System

Testing Indication	Biomarkers	Testing Sites
Testing on HER2 negative, hormone receptor positive, node positive, early breast cancer at high risk of disease recurrence where Ki-67 directed therapy is being considered	Ki-67	<ul style="list-style-type: none"> • Grand River Hospital • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • Lakeridge Health • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System

Central Nervous System (CNS)

Note: CNS indications are currently undergoing review and are intended for the adult population.

Ependymomas

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed adult cases of Ependymoma (infratentorial)	H3 K27me3, EZHIP, chrom 1q gain, chrom 6q loss	<ul style="list-style-type: none"> • Hospital for Sick Children (SickKids)
Reflex testing on newly diagnosed adult cases of Ependymoma (supratentorial)	ZFTA, YAP1, CDK2NA	<ul style="list-style-type: none"> • Trillium Health Partners - Credit Valley Site
Testing to support newly diagnosed adult cases of Ependymoma (spinal cord)	MYCN amplification	<ul style="list-style-type: none"> • London Health Sciences Centre • Trillium Health Partners - Credit Valley Site

High-Grade Gliomas

Testing Indication	Biomarkers	Testing Sites
<p>Reflex testing should be performed on tumours from newly diagnosed adult patients with astrocytic and oligodendroglial tumours, including glioblastomas (all diffuse high-grade gliomas Stage III and IV).</p> <p><i>Additional testing as needed to confirm diagnosis and subtype</i></p>	<p>ATRX, IDH R132H, p53</p>	<ul style="list-style-type: none"> • London Health Sciences Centre • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health – St. Michael’s Hospital • University Health Network
<p>1p/19q, CDKN2A testing should be performed on patients who test positive for an IDH1 mutation.</p>	<p>1p/19q, CDKN2A</p>	<ul style="list-style-type: none"> • London Health Sciences Centre • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health – St. Michael’s Hospital • University Health Network
<p>For IDH wild-type patients diagnosed with Grade II and III tumours, sequencing should be performed.</p>	<p>IDH, TERT, EGFR, +7/-10</p>	<ul style="list-style-type: none"> • London Health Sciences Centre • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health – St. Michael’s Hospital • University Health Network
<p>MGMT testing should be performed on all Grade IV patients > 55, all Grade III patients >55 and IDH wild-type Grade III patients ≤ 55.</p>	<p>MGMT Promoter Methylation</p>	<ul style="list-style-type: none"> • London Health Sciences Centre • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health – St. Michael’s Hospital • University Health Network
<p>H3-K27M testing should be performed on patients diagnosed with a glioma tumour in the midline location.</p>	<p>H3-K27M</p>	<ul style="list-style-type: none"> • London Health Sciences Centre • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health – St. Michael’s Hospital • University Health Network

Medulloblastomas

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed adult cases of medulloblastoma.	CTNNB1, INI1/SMARCB1, FLNA, p53*, Nanostring/ Methylation for subtyping	<ul style="list-style-type: none"> Hospital for Sick Children (SickKids)
*TP53 testing should be performed on patients with an abnormal p53 IHC result.	TP53 SNV	<ul style="list-style-type: none"> Hospital for Sick Children (SickKids)

Cervix

Testing Indication	Biomarkers	Testing Sites
Newly diagnosed cases of cervical carcinoma where HPV status cannot be determined from histology/p16 staining.	HPV	<ul style="list-style-type: none"> Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Health Sciences North Markham Stouffville Hospital Mount Sinai Hospital Sunnybrook Health Sciences Centre The Ottawa Hospital Trillium Health Partners – Credit Valley Site University Health Network William Osler Health System
Testing on cases of persistent, recurrent, or metastatic cervical cancer where PD-L1 directed therapy is being considered.	PD-L1	<ul style="list-style-type: none"> Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton London Health Sciences Centre Mount Sinai Hospital Sunnybrook Health Sciences Centre The Ottawa Hospital Unity Health - St. Michael's Hospital University Health Network William Osler Health System Dynacare

Colorectal

Testing Indication	Biomarkers	Testing Sites
<p>Reflex testing on newly diagnosed tumours with invasive colorectal cancer.</p>	<p>MLH1, MSH2, MSH6, PMS2</p>	<ul style="list-style-type: none"> • Grand River Hospital • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston General Hospital • Lakeridge Health • London Health Sciences Centre • Markham Stouffville Hospital • Mount Sinai Hospital • North York General Hospital • Royal Victoria Regional Health Centre • Southlake Regional Health Centre • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System • Dynacare • LifeLabs
<p>BRAF testing should be performed for colorectal cancer cases with abnormal MLH1 results.</p>	<p>BRAF</p>	<ul style="list-style-type: none"> • Health Sciences North • Kingston Health Sciences Centre • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • University Health Network • Dynacare • LifeLabs

Colorectal and Small Bowel

Testing Indication	Biomarkers	Testing Sites
<p>Reflex testing on newly diagnosed cases of advanced*/metastatic colorectal or small bowel carcinoma.</p> <p>*For biomarker testing purposes, advanced is considered CRC/Small Bowel tumours Stage III and above</p>	<p>BRAF, KRAS, NRAS, PIK3CA</p>	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare • Health Sciences North • Hospital for Sick Children (SickKids) • Kingston Health Sciences Centre • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • University Health Network • William Osler Health System • LifeLabs

Endometrium

Testing Indication	Biomarkers	Testing Sites
<p>Serous (high grade/advanced) endometrial carcinoma where HER2 directed therapy is being considered.</p>	<p>HER2</p>	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed tumours with invasive endometrial carcinoma when needed to establish subtype.	p53, ER, PR	<ul style="list-style-type: none"> ● Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton ● Health Sciences North ● Kingston Health Sciences Centre ● Lakeridge Health ● London Health Sciences Centre ● Markham Stouffville Hospital ● Mount Sinai Hospital ● North Bay Regional Health Centre ● North York General Hospital ● Sunnybrook Health Sciences Centre ● The Ottawa Hospital ● Trillium Health Partners - Credit Valley Site ● Unity Health - St. Michael's Hospital ● University Health Network ● William Osler Health System ● Dynacare ● LifeLabs
Reflex testing on newly diagnosed tumours with invasive endometrial carcinoma.	CTNNB1, KRAS, PIK3CA, POLE, PTEN, TP53	<ul style="list-style-type: none"> ● Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton ● Kingston Health Sciences Centre ● London Health Sciences Centre ● Mount Sinai Hospital ● Sunnybrook Health Sciences Centre ● The Ottawa Hospital ● Trillium Health Partners - Credit Valley Site ● University Health Network ● William Osler Health System ● LifeLabs

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed tumours with invasive endometrial cancer.	MLH1, MSH2, MSH6, PMS2	<ul style="list-style-type: none"> ● Grand River Hospital ● Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton ● Health Sciences North ● Kingston Health Sciences Centre ● Lakeridge Health ● London Health Sciences Centre ● Markham Stouffville Hospital ● Mount Sinai Hospital ● Royal Victoria Regional Health Centre ● Sunnybrook Health Sciences Centre ● The Ottawa Hospital ● Trillium Health Partners - Credit Valley Site ● Unity Health - St. Michael's Hospital ● University Health Network ● William Osler Health System ● Dynacare ● LifeLabs

Head and Neck

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed tumours with metastatic, unresectable recurrent head and neck squamous cell carcinoma.	PD-L1	<ul style="list-style-type: none"> ● Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton ● Health Sciences North ● Kingston Health Sciences Centre ● London Health Sciences Centre ● Mount Sinai Hospital ● Sunnybrook Health Sciences Centre ● The Ottawa Hospital ● Trillium Health Partners - Credit Valley Site ● University Health Network ● William Osler Health System ● Dynacare

Testing Indication	Biomarkers	Testing Sites
Testing to support diagnosis of nasopharyngeal carcinoma (newly diagnosed or suspected nasopharyngeal carcinoma).	EBER	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Hospital for Sick Children (SickKids) • Kingston Health Sciences Centre • London Health Sciences Centre • Markham Stouffville Hospital • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System
Newly diagnosed cases of squamous cell carcinoma where HPV status cannot be determined from histology/p16 staining.	HPV	<ul style="list-style-type: none"> • Health Sciences North • Markham Stouffville Hospital • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • Trillium Health Partners – Credit Valley Site • University Health Network • William Osler Health System
Testing on all sinonasal carcinoma where HPV and EBV have been excluded	SMARCA4, SMARCB1	<ul style="list-style-type: none"> • Hospital for Sick Children (SickKids) • London Health Sciences Centre • Mount Sinai Hospital • William Osler Health System
Testing on all sinonasal carcinoma where HPV and EBV have been excluded, and with retained/equivocal SMARC immunohistochemistry test results.	DEK::AFF2, EWSR1::FLI, EGFR, IDH2, NUTM1, PAX3, PAX7	<ul style="list-style-type: none"> • Hospital for Sick Children (SickKids) • Mount Sinai Hospital • University Health Network

Hematology

Acute Lymphoblastic Leukemia (ALL)

Testing Indication	Biomarkers	Testing Sites
Rapid Workup of select biomarkers to guide early management decisions in cases of ALL	BCR::ABL1	<ul style="list-style-type: none"> • Children's Hospital of Eastern Ontario • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Hospital for Sick Children (SickKids) • Kingston Health Sciences Centre • London Health Sciences Centre • North York General Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • University Health Network • William Osler Health System
Cytogenetic analysis (Karyotyping) for all new diagnoses of ALL in line with established criteria	Please refer to 2016 Pathology Recommendations for Complex Malignant Hematology*	<ul style="list-style-type: none"> • Children's Hospital of Eastern Ontario • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Hospital for Sick Children (SickKids) • Kingston Health Sciences Centre • London Health Sciences Centre • North York General Hospital • Sunnybrook Health Sciences Centre • Trillium Health Partners - Credit Valley Site • University Health Network
FISH analysis in cases of ALL where karyotyping is insufficient or criteria for additional testing is met	Please refer to 2016 Pathology Recommendations for Complex Malignant Hematology*	<ul style="list-style-type: none"> • Children's Hospital of Eastern Ontario • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Hospital for Sick Children (SickKids) • Kingston Health Sciences Centre • London Health Sciences Centre • North York General Hospital • Sunnybrook Health Sciences Centre • Trillium Health Partners - Credit Valley Site • University Health Network

Testing Indication	Biomarkers	Testing Sites
Minimal Residual Disease (MRD) Testing in ALL	Please refer to 2016 Pathology Recommendations for Complex Malignant Hematology*	<ul style="list-style-type: none"> Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Health Sciences North Hospital for Sick Children (SickKids) Kingston Health Sciences Centre London Health Sciences Centre Trillium Health Partners - Credit Valley Site University Health Network

*<https://www.cancercareontario.ca/en/guidelines-advice/types-of-cancer/43061>

Acute Myeloid Leukemia (AML) / Acute Promyelocytic Leukemia (APL)

Testing Indication	Biomarkers	Testing Sites
Repeat FLT3 testing on cases of relapsed or refractory acute myeloid leukemia where therapy with Gilteritinib is being considered.	FLT3 (ITD)	<ul style="list-style-type: none"> Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Health Sciences North Kingston Health Sciences Centre London Health Sciences Centre The Ottawa Hospital University Health Network
Rapid Workup of select biomarkers to guide early management decisions in cases of AML/APL	PML::RARA, BCR::ABL1, FLT3 (ITD/TKD), NPM1	<ul style="list-style-type: none"> Children's Hospital of Eastern Ontario Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Health Sciences North Hospital for Sick Children (SickKids) Kingston Health Sciences Centre London Health Sciences Centre North York General Hospital Sunnybrook Health Sciences Centre The Ottawa Hospital Trillium Health Partners - Credit Valley Site University Health Network William Osler Health System
Cytogenetic analysis (Karyotyping) for all new diagnoses of AML/APL in line with established criteria	Please refer to 2016 Pathology Recommendations for Complex Malignant Hematology*	<ul style="list-style-type: none"> Children's Hospital of Eastern Ontario Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Health Sciences North Hospital for Sick Children (SickKids) Kingston Health Sciences Centre North York General Hospital London Health Sciences Centre Sunnybrook Health Sciences Centre Trillium Health Partners - Credit Valley Site University Health Network

Testing Indication	Biomarkers	Testing Sites
FISH analysis in cases of AML/APL where karyotyping is insufficient or criteria for additional testing is met	Please refer to 2016 Pathology Recommendations for Complex Malignant Hematology*	<ul style="list-style-type: none"> • Children's Hospital of Eastern Ontario • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Hospital for Sick Children (SickKids) • Kingston Health Sciences Centre • London Health Sciences Centre • North York General Hospital • Sunnybrook Health Sciences Centre • Trillium Health Partners - Credit Valley Site • University Health Network
Evaluation of Genomic Biomarkers in cases of AML/APL for diagnostic sub-classification, prognosis or therapeutic guidance	Please refer to 2016 Pathology Recommendations for Complex Malignant Hematology*	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Hospital for Sick Children (SickKids) • Kingston Health Sciences Centre • London Health Sciences Centre • North York General Hospital • Sunnybrook Health Sciences Centre • Trillium Health Partners - Credit Valley Site • University Health Network • William Osler Health System
Minimal Residual Disease (MRD) Testing in AML/APL	Please refer to 2016 Pathology Recommendations for Complex Malignant Hematology*	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • London Health Sciences Centre • Trillium Health Partners - Credit Valley Site • University Health Network

*<https://www.cancercareontario.ca/en/guidelines-advice/types-of-cancer/43061>

Chronic Lymphocytic Leukemia (CLL) / Small Lymphocytic Lymphoma (SLL)

Testing Indication	Biomarkers	Testing Sites
Testing on cases of previously untreated CLL/SLL where therapy is being considered.	Chromosome 17p deletion, TP53 mutation, Unmutated immunoglobulin heavy chain variable region (IgHV)	<ul style="list-style-type: none"> • Health Sciences North • University Health Network

Myelodysplastic Syndromes (MDS), Myeloproliferative Neoplasms (MPN) and Myelodysplastic/Myeloproliferative Neoplasms (MDS/MPN)

Testing Indication	Biomarkers	Testing Sites
Cytogenetic analysis (karyotyping) for all new diagnoses of MDS, MPN or MDS/MPN in line with established criteria.	Please refer to 2024 Consensus Diagnostic and Prognostic Testing Recommendations for MDS, MPN and MDS/MPN*	<ul style="list-style-type: none"> • Children’s Hospital of Eastern Ontario • Hamilton Health Sciences/St. Joseph’s Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • London Health Sciences Centre • North York General Hospital • Sunnybrook Health Sciences Centre • Trillium Health Partners - Credit Valley Site • University Health Network
FISH analysis in cases of MDS, MPN or MDS/MPN where karyotyping is insufficient or criteria for additional testing is met.	Please refer to 2024 Consensus Diagnostic and Prognostic Testing Recommendations for MDS, MPN and MDS/MPN*	<ul style="list-style-type: none"> • Children’s Hospital of Eastern Ontario • Hamilton Health Sciences/St. Joseph’s Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • London Health Sciences Centre • North York General Hospital • Sunnybrook Health Sciences Centre • Trillium Health Partners - Credit Valley Site • University Health Network
Evaluation of genomic biomarkers in cases of MDS, MPN or MDS/MPN for diagnostic sub-classification, prognosis or therapeutic guidance.	Please refer to 2024 Consensus Diagnostic and Prognostic Testing Recommendations for MDS, MPN and MDS/MPN*	<ul style="list-style-type: none"> • Hamilton Health Sciences/St. Joseph’s Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • London Health Sciences Centre • North York General Hospital • Sunnybrook Health Sciences Centre • Trillium Health Partners – Credit Valley Site • University Health Network • William Osler Health System

*<https://www.cancercareontario.ca/en/guidelines-advice/types-of-cancer/75246>

Hepatobiliary

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed tumours with invasive biliary / gallbladder adenocarcinoma	MLH1, MSH2, MSH6, PMS2	<ul style="list-style-type: none"> • Grand River Hospital • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • Lakeridge Health • London Health Sciences Centre • Markham Stouffville Hospital • Mount Sinai Hospital • North York General Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System • Dynacare
Testing on previously treated, unresectable locally advanced or metastatic cholangiocarcinoma (CCA) where FGFR2 directed therapy is being considered	FGFR2	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Hospital for Sick Children (SickKids) • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • University Health Network • William Osler Health System

Lung (Non-Small Cell Lung Cancer (NSCLC))

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed cases of NSCLC (adenocarcinoma/non-squamous).	PD-L1, ALK, EGFR, ROS1, BRAF, MET (Met skipping), RET, FGFR1, HER2 (ERBB2), KRAS, PIK3CA, NTRK1, NTRK2, NTRK3 Optional For 23/24: NRG1, TP53, STK11, KEAP1	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • London Health Sciences Centre • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • University Health Network • William Osler Health System

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed cases of NSCLC (squamous).	PD-L1	<ul style="list-style-type: none"> Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Health Sciences North Kingston Health Sciences Centre London Health Sciences Centre Sunnybrook Health Sciences Centre The Ottawa Hospital Trillium Health Partners - Credit Valley Site University Health Network William Osler Health System
Testing on previously diagnosed cases of locally advanced or metastatic NSCLC that has progressed on or after EGFR TKI therapy.	Acquired EGFR T790M	<ul style="list-style-type: none"> Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Health Sciences North Kingston Health Sciences Centre London Health Sciences Centre Sunnybrook Health Sciences Centre The Ottawa Hospital Trillium Health Partners - Credit Valley Site University Health Network William Osler Health System

Melanoma

Testing Indication	Biomarkers	Testing Sites
<p>Reflex testing on newly diagnosed cases of advanced*/metastatic melanoma.</p> <p>*For biomarker testing purposes, advanced is considered any melanoma >2mm in depth (pT3)</p>	BRAF, KIT, NRAS	<ul style="list-style-type: none"> Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Health Sciences North Hospital for Sick Children (SickKids) Kingston Health Sciences Centre London Health Sciences Centre Mount Sinai Hospital Sunnybrook Health Sciences Centre The Ottawa Hospital Trillium Health Partners - Credit Valley Site University Health Network William Osler Health System LifeLabs

Multiple Disease Sites

Mismatch Repair (MMR) / MLH1 Promoter Methylation Testing

MMR testing is available for the following disease sites (please refer to each section for specific testing indications):

- Adrenal Gland
- Colorectal
- Endometrium
- Esophagus
- Gallbladder
- Gastric
- Small Bowel
- Ocular
- Ovary
- Pancreas
- Skin
- Ureter

Testing Indication	Biomarkers	Testing Sites
<p>Promoter Methylation testing should be performed for all MMR cases with abnormal MLH1 results*.</p> <p>*For CRC Promoter Methylation testing should be performed only on BRAF wild-type cases.</p>	<p>MLH1 Promoter Methylation</p>	<ul style="list-style-type: none">• Health Sciences North• Kingston Health Sciences• London Health Sciences Centre• Mount Sinai Hospital• Sunnybrook Health Sciences Centre• Trillium Health Partners - Credit Valley Site• University Health Network• LifeLabs

NTRK Testing

Disease Site	Testing Indication	Testing Sites
<p>Multiple disease sites¹</p> <ul style="list-style-type: none"> Screening by IHC, followed by confirmatory testing if a variant is identified² 	<p>Testing on advanced/metastatic solid tumour cancers³ where NTRK directed therapy is being considered.</p> <p>Biomarkers: NTRK1, NTRK2, NTRK3 (Pan-TRK)</p>	<ul style="list-style-type: none"> Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Hospital for Sick Children (SickKids) Kingston Health Sciences Centre London Health Sciences Centre Mount Sinai Hospital Sunnybrook Health Sciences Centre The Ottawa Hospital University Health Network William Osler Health System
<p>Multiple disease sites¹</p> <ul style="list-style-type: none"> Screening by IHC, followed by confirmatory testing if a variant is identified² 	<p>Confirmatory testing for cases positive for NTRK by IHC.</p> <p>Biomarkers: NTRK1, NTRK2, NTRK3 (fusions)</p>	<ul style="list-style-type: none"> Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Health Sciences North Hospital for Sick Children (SickKids) Kingston Health Sciences Centre London Health Sciences Centre Mount Sinai Hospital Sunnybrook Health Sciences Centre The Ottawa Hospital Trillium Health Partners – Credit Valley Site University Health Network William Osler Health System
<p>² The following disease sites should be tested by fusion analysis only:</p> <ul style="list-style-type: none"> Soft tissue sarcoma Salivary carcinoma Primary Central Nervous System (CNS) tumours Secretory breast cancer Mammary analogue secretory carcinoma 	<p>Testing on advanced/metastatic solid tumour cancers³ where NTRK directed therapy is being considered.</p> <p>Biomarkers: NTRK1, NTRK2, NTRK3 (fusions)</p>	<ul style="list-style-type: none"> Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Health Sciences North Hospital for Sick Children (SickKids) Kingston Health Sciences Centre London Health Sciences Centre Mount Sinai Hospital Sunnybrook Health Sciences Centre The Ottawa Hospital Trillium Health Partners – Credit Valley Site University Health Network William Osler Health System

¹ NTRK testing is incorporated into existing panel testing at diagnosis for the following: Non-Small Cell Lung Cancer (NSCLC), Thyroid Cancer.

³ Where surgical resection is likely to result in severe morbidity, and, have no satisfactory treatment options.

Paragangliomas

Testing Indication	Biomarkers	Testing Sites
Reflex testing for all newly diagnosed paragangliomas (to inform need for germline testing)	SDHB	<ul style="list-style-type: none"> London Health Sciences Centre Mount Sinai Hospital Sunnybrook Health Sciences Centre University Health Network William Osler Health System

Pharmacogenomic Testing

Testing Indication	Biomarkers	Testing Sites
Testing where treatment with fluoropyrimidines is being considered	DPYD Genotyping: <ul style="list-style-type: none"> c.1905+1G>A (DPYD*2A) c.2846A>T c.1679T>G (DPYD*13) c.1236G>A/ c.1129-5923C>G (HapB3) 	<ul style="list-style-type: none"> Kingston Health Sciences Centre London Health Sciences Centre North York General Hospital Sunnybrook Health Sciences Centre The Ottawa Hospital Trillium Health Partners - Credit Valley Site University Health Network Dynacare

Ocular

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed sebaceous tumours.	MLH1, MSH2, MSH6, PMS2	<ul style="list-style-type: none"> • Grand River Hospital • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • Lakeridge Health • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System • Dynacare
Reflex testing on newly diagnosed tumours with uveal melanoma.	GNAQ, GNA11	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Hospital for Sick Children (SickKids) • Kingston Health Sciences Centre • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • Trillium Health Partners - Credit Valley Site • The Ottawa Hospital • University Health Network • William Osler Health System • Dynacare
Testing on newly diagnosed cases of unresectable or metastatic uveal melanoma	HLA-A*02:01	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • London Health Sciences Centre • The Ottawa Hospital • University Health Network

Ovary

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed epithelial and low malignant potential ovarian tumours.	MLH1, MSH2, MSH6, PMS2	<ul style="list-style-type: none"> • Grand River Hospital • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • Lakeridge Health • London Health Sciences Centre • Markham Stouffville Hospital • Mount Sinai Hospital • Royal Victoria Regional Health Centre • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System • Dynacare
Reflex testing for the diagnosis of serous tumours (epithelial ovarian, fallopian tube, peritoneal cancers) when needed to establish histologic subtype.	p53, WT1	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare • Health Sciences North • Kingston Health Sciences Centre • Lakeridge Health • London Health Sciences Centre • Markham Stouffville Hospital • Mount Sinai Hospital • North Bay Regional Health Centre • North York General Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System • Dynacare

Testing Indication	Biomarkers	Testing Sites
Reflex testing to confirm or exclude small cell carcinoma of the ovary, hypercalcemic type (SCCOHT).	SMARCA4	<ul style="list-style-type: none"> ● Hamilton Health Sciences/ St. Joseph's Healthcare ● Health Sciences North ● Hospital for Sick Children (SickKids) ● Kingston Health Sciences ● London Health Sciences Centre ● Mount Sinai Hospital ● Trillium Health Partners - Credit Valley Site ● University Health Network ● William Osler Health System
Testing to support diagnosis of sex-cord stromal tumours.	FOXL2, DICER1	<ul style="list-style-type: none"> ● Hamilton Health Sciences/ St. Joseph's Healthcare ● Hospital for Sick Children (SickKids) ● Kingston Health Sciences ● London Health Sciences Centre ● Mount Sinai Hospital ● Trillium Health Partners - Credit Valley Site ● University Health Network
Reflex testing on newly diagnosed tumours with high grade epithelial ovarian, fallopian tube, or primary peritoneal cancer.	BRCA1, BRCA2	<ul style="list-style-type: none"> ● Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton ● Hospital for Sick Children (SickKids) ● Kingston Health Sciences ● London Health Sciences Centre ● Mount Sinai Hospital ● Sunnybrook Health Sciences Centre ● The Ottawa Hospital ● Trillium Health Partners - Credit Valley Site ● University Health Network ● William Osler Health System

Pancreas

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed tumours with invasive carcinoma of the pancreas.	MLH1, MSH2, MSH6, PMS2	<ul style="list-style-type: none"> • Grand River Hospital • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • Lakeridge Health • London Health Sciences Centre • Markham Stouffville Hospital • Mount Sinai Hospital • North York General Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System • Dynacare

Penile

Testing Indication	Biomarkers	Testing Sites
Newly diagnosed cases of penile carcinoma where HPV status cannot be determined from histology/p16 staining.	HPV	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Markham Stouffville Hospital • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • Trillium Health Partners – Credit Valley Site • The Ottawa Hospital • University Health Network • William Osler Health System

Prostate

Testing Indication	Biomarkers	Testing Sites
Testing on newly diagnosed tumours with advanced/metastatic prostate carcinoma.	ATM, BRCA1, BRCA2, PALB2 AR	<ul style="list-style-type: none"> Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Kingston Health Sciences Centre London Health Sciences Centre Mount Sinai Hospital Sunnybrook Health Sciences Centre The Ottawa Hospital Trillium Health Partners - Credit Valley Site University Health Network William Osler Health System

Skin

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed sebaceous neoplasms.	MLH1, MSH2, MSH6, PMS2	<ul style="list-style-type: none"> Grand River Hospital Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton Health Sciences North Kingston Health Sciences Centre Lakeridge Health London Health Sciences Centre Markham Stouffville Hospital Mount Sinai Hospital Sunnybrook Health Sciences Centre The Ottawa Hospital Trillium Health Partners - Credit Valley Site Unity Health - St. Michael's Hospital University Health Network William Osler Health System Dynacare LifeLabs

Small Bowel

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed tumours with advanced/metastatic small bowel carcinoma.	MLH1, MSH2, MSH6, PMS2	<ul style="list-style-type: none"> • Grand River Hospital • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • Lakeridge Health • London Health Sciences Centre • Markham Stouffville Hospital • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System • Dynacare • LifeLabs

Soft Tissue and Bone

Note: Soft Tissue & Bone indications are currently undergoing review and are intended for the adult population.

Testing Indication	Biomarkers	Testing Sites
Secondary review - Review of tumour by a subspecialist Pathologist for classification	Please refer to 2023 Pathology Recommendations for Mesenchymal Tumours of Soft Tissue and Bone*	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Mount Sinai Hospital • The Ottawa Hospital
Immunohistochemical evaluation, where indicated, to assess line of differentiation for classification	Please refer to 2023 Pathology Recommendations for Mesenchymal Tumours of Soft Tissue and Bone*	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • London Health Sciences Centre • Mount Sinai Hospital • The Ottawa Hospital

Testing Indication	Biomarkers	Testing Sites
<p>Molecular interrogation, where indicated, for classification, prognostic and/or therapeutic purposes.</p> <p>When applicable more than one type of molecular assay may be included (e.g. RNA, DNA, or methylation-based assay)</p>	<p>Please refer to 2023 Pathology Recommendations for Mesenchymal Tumours of Soft Tissue and Bone*</p>	<ul style="list-style-type: none"> • Mount Sinai Hospital • The Ottawa Hospital
<p>Assessment of gene amplification (e.g. MDM2, CDK4, BCOR); FISH, array, and/or NGS methods acceptable</p>	<p>Please refer to 2023 Pathology Recommendations for Mesenchymal Tumours of Soft Tissue and Bone*</p>	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • London Health Sciences Centre • Mount Sinai Hospital • The Ottawa Hospital
<p>Reflex testing on newly diagnosed CD117 (cKIT) positive Gastrointestinal Stromal Tumours (GIST)</p>	<p>BRAF, KIT, PDGFRA</p> <p>Optional For 23/24: SDH, NF1, NTRK (fusion), FGFR (fusion)</p>	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Hospital for Sick Children (SickKids) • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners – Credit Valley Site • University Health Network • William Osler Health System
<p>SDHB testing on GIST for negative molecular results</p>	<p>SDHB</p>	<ul style="list-style-type: none"> • Hospital for Sick Children (SickKids) • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre

* <https://www.cancercareontario.ca/en/guidelines-advice/types-of-cancer/73926>

Stomach

Testing Indication	Biomarkers	Testing Sites
Testing on newly diagnosed gastric tumours when EBV associated adenocarcinoma is being considered.	EBER	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Hospital for Sick Children (SickKids) • Kingston Health Sciences Centre • London Health Sciences Centre • Markham Stouffville Hospital • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Trillium Health Partners - Credit Valley Site • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System

Stomach/Esophagus

Testing Indication	Biomarkers	Testing Sites
Reflex testing on newly diagnosed invasive gastroesophageal adenocarcinomas.	MLH1, MSH2, MSH6, PMS2 HER2	<ul style="list-style-type: none"> • Hamilton Health Sciences/ St. Joseph's Healthcare Hamilton • Health Sciences North • Kingston Health Sciences Centre • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System
Reflex testing on newly diagnosed invasive gastroesophageal adenocarcinomas.	PD-L1	<ul style="list-style-type: none"> • Kingston Health Sciences Centre • London Health Sciences Centre • Mount Sinai Hospital • Sunnybrook Health Sciences Centre • The Ottawa Hospital • Unity Health - St. Michael's Hospital • University Health Network • William Osler Health System

Thyroid

Testing Indication	Biomarkers	Testing Sites
Testing on all metastatic thyroid cancer, including sporadic medullary and radio-iodine refractory well differentiated thyroid cancer.	BRAF, HRAS, NRAS, NTRK3, PPARG, RET, KRAS	<ul style="list-style-type: none">• Kingston Health Sciences Centre• London Health Sciences Centre• Mount Sinai Hospital• Sunnybrook Health Sciences Centre• The Ottawa Hospital• Trillium Health Partners - Credit Valley Site• University Health Network• William Osler Health System

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