

DATE:	18 August 2025
TO:	All Pathologists and Oncologists
FROM:	Molecular Pathology Program, Alberta Precision Laboratories
RE:	NGS Gene Fusion Panel Changes in Cancers of All Organ Systems

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Key Message

- Effective August 26, 2025, a new Next Generation Sequencing (NGS) fusion panel will be offered provincially for diagnostic and predictive fusion testing in cancer.
- This custom Pan-Cancer Fusion RNA Panel will include 358 genes and will replace current fusion testing of five EPIC orders.
- Testing will be centralized in the Molecular Pathology South laboratory at the Arthur J.E. Child Comprehensive Cancer Centre. Acceptable samples will include formalin fixed paraffin embedded (FFPE) tissue, FFPE fixed cytology cell blocks, peripheral blood (PB) and bone marrow aspirates (BM).
- Current approved testing indications will remain the same.

Background

- Current NGS fusion panel testing in APL Molecular Pathology includes the Kinase Fusion RNA Panel (17 genes) and Pan-Solid Tumor Fusion RNA Panel (103 genes). These two panels are utilized for RNA fusion testing in 5 current EPIC orders (see table below).
- A larger Pan Cancer Fusion RNA Panel is being introduced, that will replace these current fusion assays.
- Benefits of the new Pan-Cancer Fusion RNA Panel include:
 - Updated 358 gene panel content for solid tumor fusion (see lab test directory for full gene list)
 - Consolidation of multiple molecular lab workflows into one universal panel
 - Leveraging new high-throughput sequencers and automated liquid handlers
 - Sequencer redundancy to reduce downtime from technical issues
 - Higher throughput
- FFPE specimen collection requirements remain the same as for prior NGS fusion panels.
- Similar to current Archer FusionPlex panels, RNA is not an ideal analyte for detecting single nucleotide variants (SNVs) and/or insertions/deletions (indels), and this test cannot exclude SNVs/indels when not detected. The panel is primarily indicated for detection of gene fusions, selected oncogenic splice variants, and selected internal tandem duplications (ITDs) (e.g. BCOR ITDs).
- This assay cannot detect promoter-swapping fusions such as IGH fusions in lymphoma – fluorescent in situ hybridization (FISH) is recommended to detect such fusions.
- On rare occasions, gene fusions may not be detected on this panel despite adequate tumor percentage and sample quality due to low fusion expression level, rare breakpoints not targeted by probes, or bioinformatics challenges (paralogs, alignment issues, etc.).

How this will impact you

- All currently approved test indications, ordering methods, FFPE specimen collection requirements, target turnaround times, and report formats for RNA NGS fusion panels remain the same.



- The following 5 EPIC orders will use the new Pan-Cancer Fusion RNA Panel in place of the older panel. Some orders will remain the same whereas others will be replaced with a new order. Please refer to the table below as to the specific changes:

Current EPIC order	EPIC order after August 26	Additional information
PAN-SOLID TUMOR RNA FUSION PANEL, TUMOR	PAN-CANCER FUSION RNA PANEL, TUMOR	Name and test methodology change.
KINASE FUSION RNA PANEL, TUMOR		Order name retired and replaced.
COMBINED CANCER BIOMARKER DNA AND PAN-SOLID TUMOR FUSION RNA PANEL, TUMOR	COMBINED CANCER BIOMARKER DNA AND PAN-CANCER FUSION RNA PANEL, TUMOR	Name and test methodology change.
LUNG CARCINOMA MUTATION ANALYSIS	LUNG CARCINOMA MUTATION ANALYSIS	Name unchanged. Test methodology changed for South sector cases only.
THYROID CARCINOMA MUTATION ANALYSIS, TUMOR	THYROID CARCINOMA MUTATION ANALYSIS, TUMOR	Name unchanged. Test methodology changed provincially.

Action Required

- Pathologists:** Switch to ordering the new “PAN-CANCER FUSION RNA PANEL, TUMOR” or “COMBINED CANCER BIOMARKER DNA AND PAN-CANCER FUSION RNA PANEL, TUMOR” orders on FFPE, PB or BM specimens when necessary for diagnostic purposes in the clinicopathologic context.
- Oncologists:** Be aware that results of the above tests need to be integrated in the clinicopathologic context to inform the diagnosis. Please reach out to the pathologist responsible for the specimen for clarification of the diagnostic significance of results when necessary.
- Both:** Continue to order the “LUNG CARCINOMA MUTATION ANALYSIS” and “THYROID CARCINOMA MUTATION ANALYSIS, TUMOR” as per approved clinical indications, while being aware the fusion test method has changed for South Sector lung cancers and provincial thyroid cancers.

Effective August 26, 2025

Questions/Concerns

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