Sample Preservation

Tissue preservation methods can impact test results and therefore should be optimized to maintain sample quality.[14]

Decrease time to fixation

Immediate fixation (within **1 hour** of acquisition) is important for preserving tumor characteristics for diagnostic testing.[15]

Choose an appropriate fixative

Tissues should be preserved using appropriate solutions based on the testing that will be performed.[3]

10% NBF[3,14]

- Most common
- **Recommended by guidelines**
- **Can be used for histologic and molecular analyses**

70% ethanol[14]

- Often used for cytology
- **Not suitable for most histologic analyses**

Optimize duration of fixation

Both underfixation and overfixation can affect sample quality and the accuracy of the biomarker test results.[14,16]

Guidelines recommend fixation for **6 to 48 hours**, depending on the size of the sample.[14]

Proper sample preservation is critical for ensuring that the quality of the sample is appropriate for diagnostic testing.[1,14]

NBF, neutral-buffered formalin.

A Focus on Guidelines:

Best Practices for Tissue Sample Collection in mNSCLC

*In mNSCLC, tissue collection may be necessary **at diagnosis and upon disease progression** to test for **biomarkers that can inform treatment decisions.***[1]

Guidelines recommend testing for multiple different biomarkers, including EGFR, ALK, BRAF, ROS1, and PD-L1; therefore, sufficient tissue must be collected and preserved appropriately to perform all biomarker tests.[1,2]

According to the **AMERICAN THORACIC SOCIETY**[1]

*"**Potentially all treatment decisions**, at the time of diagnosis and later, will be based on the information obtained from [the tumor sample]. Therefore, it is essential that the **specimen collection and processing procedures be optimized** to ensure that the quality and quantity of the specimen are adequate."*

ALK, anaplastic lymphoma kinase; BRAF, v-Raf murine sarcoma viral oncogene homolog B; EGFR, epidermal growth factor receptor; mNSCLC, metastatic non–small cell lung cancer; PD-L1, programmed death-ligand 1; ROS1, ROS proto-oncogene 1, receptor tyrosine kinase.

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Tissue Collection

Collect sufficient sample

Multiple diagnostic tests are required to determine the most appropriate treatment options for a patient.[1,3] To ensure that all necessary testing can be performed, guidelines agree that obtaining sufficient sample quantity is essential.[1,2,4]

NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®)[2]	*"[Biopsying physicians] should procure sufficient tissue to enable all appropriate testing."*
American Thoracic Society[1]	*"[Biopsying physicians] should adapt diagnostic procedures…to ensure that specimens are sufficient for molecular and immunohistochemical testing."*
CHEST[4]	*"It is recommended that adequate tissue be obtained to accurately define the histologic type and to perform molecular analysis."*

Choose an appropriate collection method

Different sample collection methods may yield different amounts of tissue and therefore must be chosen carefully.[5,6] To maximize the amount of tissue available for diagnostic testing, guidelines recommend:

Using image-guided procedures[5] | Performing dedicated passes for ancillary studies[5] | Obtaining concurrent CNB and FNAs if possible[5]

Both **CT-guided CNB and FNA** have been shown to yield sufficient tumor tissue for biomarker testing.[7]

Coordinate rapid on-site evaluation (ROSE)

Guidelines recommend using ROSE, which allows a pathologist or technologist to assess sample quality and quantity on-site and thereby:

Ensure that the sample is sufficient for biomarker testing[4,5,8] | Provide the biopsying physician with an opportunity to collect additional samples if necessary[4,5,8]

ROSE has been shown to:

↑ Increase amount of **tissue collected** for diagnostic testing[9-13]

↓ Decrease the need for **rebiopsy**[9-13]

Sufficient sample collection is critical for timely testing and informing treatment decisions at diagnosis and progression.[1,4,8]

CNB, core needle biopsy; CT, computed tomography; FNA, fine needle aspiration; NCCN, National Comprehensive Cancer Network.

Multidisciplinary Team Collaboration

Because biomarker testing can inform treatment decisions, communicating with your multidisciplinary team to reduce turnaround time is critical.[1,4,8] Multidisciplinary team collaboration has been shown to increase adherence to guidelines and improve patient outcomes, including survival.[1,17]

Communicate with the medical oncologist and pathologist in your multidisciplinary team to:

Optimize tissue collection to ensure sample quantity is sufficient for all necessary diagnostic tests[4-6,14]

Develop a standard protocol for performing ROSE to verify sample quantity and quality[8]

Discuss appropriate sample preservation methods, based on the diagnostic testing required[4-6,14]

Guidelines recommend that the biopsying physician play an active role in the multidisciplinary team to ensure accurate and timely biomarker test results and thereby inform treatment decisions.[1,4,5,14]

For even more information about best practices in biomarker testing, visit **AZOncologyID.com.**

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