Clinical practice guidelines recommend broad genetic profiling by next-generation sequencing (NGS) for advanced non-small-cell lung cancer (NSCLC) to guide first-line treatment. Yet, small biopsies and low-tumor content samples pose challenges to testing. The data below, from laboratories across the world, show how limited many of these samples are. While NGS is generally seen as a tissue-saving method given its ability to deliver multiple biomarker results with a single sample, it is important to understand that the sample size and content requirements are not equal for all NGS-based methods. Some NGS-based methods can test smaller samples and deliver results for more patients.

### Method 1
- 20% minimum tumor content
- 30% optimum tumor content
- 50 ng–1,000 ng minimum input
- 5 mm² minimum sample size, entire block or 10 slides required

### Method 2
- No minimum surface area requirement; 2 slides for resection, 9 for CNB required
- 10% minimum tumor content
- 10 ng minimum input required

### Sample requirements can differ greatly from one test to the next

#### Cancer Genetics, Inc., New Jersey

- 50% of all samples had less than 25 mm² tumor area
- 46% of all samples had less than 20% tumor content

#### Life Lab, California

- 75% of all samples had less than 25 mm² tumor area
- 32% of all samples had less than 20% tumor content

#### Sarah Cannon Molecular Diagnostic Laboratory, London

- 88% of all samples had less than 25 mm² tumor area
- 75% of all samples had less than 20% tumor content

### Potential impact of different sample requirements on patients

The difference in the ability of each method to accommodate small samples can have a direct impact on patients’ outcomes. Based on the tumor area alone, only 215 out of 1,791 patient samples submitted to Cancer Genetics, Inc. could be tested using Method 1, while all 1,791 samples could be tested using Method 2.

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### References
1. NGS to take top spot as cancer biomarker testing broadens. CAP TODAY, June 2018
2. Life Lab Internal Audit data on file
3. Tissue is still the issue, David Moore; The Pathologist, May 2018

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