# Liquid Biopsy: The RGA Perspective

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## Introduction

Within the last few years the term “liquid biopsy” has come into common usage and the concept is receiving significant attention in both the medical and non-medical literature. Great hope (and perhaps hype) have also been generated, with claims of liquid biopsies becoming a game-changer primarily in the diagnosis and treatment of cancer. Driving this forward is significant large-scale investment[5] in this new and rapidly developing technology, both commercially and academically.

This paper will describe the current status of liquid biopsies in the context of cancer, discuss their multiple potential applications, and assess the possible impact on mortality and

Additionally, fragments of cell-free nucleic acids (cfNA) such as cfDNA and ctDNA, and circulating non-coding RNAs (ncRNAs) such as messenger RNA (mRNA), micro RNA (miRNA) or long ncRNA (lncRNA),[3] can be detected not only in plasma or serum but also in urine,

| Liquid Biopsy Test Criteria | |
|---|---|
| Analytical Validity | T ab , fa de ec a d ea e e ce, fab, a e, f e acc a e , e d cb , a d e ab . |
| Clinical Validity | T ab , fa d de, e , a , e ba , f, e . |
| Clinical Utility | T ab , fa de , a e e e da , , ea e a a e e , e e , fca ce |
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According to Daniel Hayes, M.D., of the University of Michigan Comprehensive Care Center and former president of the American Society of Clinical Oncologists, “the bottom line is clinical utility – does the result of the assay lead to a clinical decision that’s been shown with a high level of evidence to improve outcome?” He goes on to indicate that doctors need to determine clinical utility before this testing can be applied to patients.[10]

Furthermore, Lynn Sorbara, Ph.D., of the National Cancer Institute (U.S.) recently stated, “I think the major stumbling block for moving these liquid biopsy tests forward is there is not enough clinical verification and validation to know and feel comfortable that what we’re detecting with them is clinically meaningful.”[11]

Keeping the above test criteria in mind, along with current medical opinion, the potential uses of liquid biopsy are frequently grouped into the following categories with regard to cancer:

- screening
- treatment selection and real-time monitoring of response (prognosis)
- identification of resistance mechanisms
- detection of recurrence

Undoubtedly, the greatest hope of liquid biopsy is its potential ability to revolutionize early detection of and screening for cancers. It is generally believed that curative therapies are most successful when cancer is diagnosed and treated at an early stage. While this paradigm may generally be true, screening can identify potential tumors that may have no impact on life expectancy and may expose the individual to unnecessary testing and potentially higher morbidity.

Statistically, earlier detection of a cancer without actual improvement in survival is referred to as “lead time bias” and must be controlled for in clinical studies to avoid attributing erroneous value to the screening test.

While research continues aggressively in the cancer screening space, the biological, technical, and clinical obstacles to developing a safe and e□ective pan-cancer screening test are significant.[12]

Life insurance

## Health and medical reimbursement

As more biotechnology companies develop liquid biopsy tests, the costs of performing such tests over time could drop to the point that they might be more cost-e□ective than standard tissue biopsies. The average cost of tissue biopsy in lung cancer can be as high as $15,000.[8] The cost is much higher in the event of any complications requiring hospitalization. The liquid biopsy test GeneStrat®, for example, is significantly less expensive than standard tissue-based biopsies, with an average savings of approximately $3,300 and $7,400 for CT-guided and navigational bronchoscopies, respectively, in patients with confirmed NSCLC.[9]

Presently, only a few liquid biopsy tests are included in standard clinical med

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# Contacts