PRECISION MEDICINE AND BIOMARKER TESTING: 
TWO SIDES OF THE SAME COIN

UPAL BASU ROY, PHD, MPH
SENIOR DIRECTOR OF RESEARCH

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National Lung Cancer Roundtable

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THE LUNG CANCER PATIENT ... THEN...
AND... NOW...

When the lung cancer patient climbs mountains.
AS OUR UNDERSTANDING OF THE MOLECULAR HETEROGENEITY OF LUNG CANCER INCREASES....

Biomarkers identified in lung adenocarcinoma

SO IS CLINICAL RESEARCH...

132 new treatment approaches/drugs in development for lung cancer

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From: Data downloaded from Clinicaltrials.gov and analyzed (data from April 2018), PhRMA report, 2018, Medicines in Development for Cancer 2018 report
...AND BIOMARKER-DRIVEN DRUG APPROVALS

New treatment approaches approved by FDA

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STAKEHOLDERS IN THE TREATMENT JOURNEY

Take Aim is a multi-year, multi-stakeholder initiative to ensure that all people diagnosed with advanced stage non-small cell lung cancer have access to high quality, comprehensive biomarker testing—a key component of precision medicine.

- **Awareness/Education:** Increase patient & healthcare providers awareness of the need for timely comprehensive biomarker testing for NSCLC patients.

- **Tissue Acquisition:** Ensure adequate tissue is acquired from the patient on the first biopsy for comprehensive biomarker testing.

- **Tissue Handling:** Ensure that the patient’s tissue is properly handled for comprehensive biomarker testing.

**Public Policy:**
LUNGevity’s Public Policy agenda and initiatives complement and support Take Aims goals of ensuring that patients diagnosed with NSCLC have timely access to high quality, comprehensive biomarker testing.
ARE WE BEING CONSISTENT IN OUR TERMINOLOGY?

Analyzed terminology being used by 28 organizations (patient advocacy organizations, pharmaceutical and diagnostic companies, and government and health sites)

**Major Findings/Recommendations:**

1. Too many terms are used by organizations, leading to confusion on the patient’s part

2. Participating organizations agreed to use **BIOMARKER TESTING** (because it encompasses both gene-based and IHC-based tests)
Are we being consistent in our message/call-to-action?

Effective Biomarker Testing Message

Analyzed messaging content from 24 organizations (patient advocacy organizations, pharmaceutical and diagnostic companies, and professional societies)

**Major Findings/Recommendations:**

1. Patients are receiving confusing messages without a clear call to action
2. Most organizations included in the audit are not answering all six questions
3. Results presented at CancerCare Roundtable → Working with CancerCare and LungCAN to operationalize findings
ARE NSCLC PATIENTS AWARE ABOUT BIOMARKER TESTING?

<table>
<thead>
<tr>
<th>Race</th>
<th>REM (N=336)</th>
<th>LUNGevity (N=373)</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian or Alaska Native</td>
<td>11 (3.3%)</td>
<td>2 (0.6%)</td>
</tr>
<tr>
<td>Asian</td>
<td>15 (4.5%)</td>
<td>9 (2.5%)</td>
</tr>
<tr>
<td>Black or African American</td>
<td>61 (18.2%)</td>
<td>14 (3.9%)</td>
</tr>
<tr>
<td>Native Hawaiian or Other Pacific Islander</td>
<td>8 (2.4%)</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Other</td>
<td>20 (6.0%)</td>
<td>14 (3.9%)</td>
</tr>
<tr>
<td>White</td>
<td>221 (65.8%)</td>
<td>321 (88.9%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>REM (N=336)</th>
<th>LUNGevity (N=373)</th>
</tr>
</thead>
<tbody>
<tr>
<td>College or graduate/professional school</td>
<td>154 (45.8%)</td>
<td>245 (68.2%)</td>
</tr>
<tr>
<td>Some college or technical school</td>
<td>116 (34.5%)</td>
<td>97 (27.0%)</td>
</tr>
<tr>
<td>High School or GED</td>
<td>62 (18.5%)</td>
<td>17 (4.7%)</td>
</tr>
<tr>
<td>No High School</td>
<td>4 (1.2%)</td>
<td>0 (0.0%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biomarker testing (Self-reported)</th>
<th>REM (N=336)</th>
<th>LUNGevity (N=373)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have not been tested for a biomarker/I don't know</td>
<td>83 (51.5%)</td>
<td>51 (16.3%)</td>
</tr>
</tbody>
</table>

REM – Racial and Ethnic Minority

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LUNGEVITY’S TAKE AIM INITIATIVE
ADVANCED DIAGNOSTIC TESTING – THE FIRST STEP IN PRECISION MEDICINE

OVERVIEW

LUNGeVITY’s Take Aim Initiative focuses on biomarker testing and ensuring that all people with advanced stage NSCLC have access to high-quality, comprehensive biomarker testing—a key component of precision medicine—at both diagnosis and recurrence of their disease. Completing comprehensive biomarker testing at diagnosis and recurrence ensures that patients will be given access to therapies and clinical trials targeted at their cancer’s mutation, and that they have the information needed to participate in their healthcare decision-making.

LUNGEVITY created Take Aim in 2015 as a multi-stakeholder, multi-year initiative to break down barriers to comprehensive biomarker testing. Multiple partners including professional societies, clinicians, diagnostic companies, leaders in the pharma/biotech industry, patients, and patients together wrote to address the following issues:

• Increasing patient/provider awareness about biomarker testing
• Changing patient/provider practice on inadequate tissue handling
• Changing healthcare practice on improper tissue handling

TakeAim

Take Aim is a multi-year, multi-stakeholder initiative to ensure that all people diagnosed with advanced stage non-small cell lung cancer have access to high-quality, comprehensive biomarker testing—a key component of precision medicine.

2019 ACTIVITY

MEETINGS
LUNGEVITY-ACS CAN Joint Meeting – Paper Coverage Report
Brieﬁng
• Lung Cancer Roundtables
• Pan-Cancer Best Practices Roundtable
• Pre-Analytic Tissue Handling Summit

PROJECTS
• Collaborate with societies, laboratories, diagnostic test manufacturers, and the biotech/pharma community to better support patients’ needs on reading, understanding, and acting on information from biomarker testing pathology reports.
• Collaborate with the ACCS in lead “Empowering & Educating Patients” workstream within ACCS’s Integration of Pathology into Oncology Care Initiative.

CAMPAIGNS
• Right Track Campaign with Harvard Business School Kraf
• Kraf Medicine Accelerator
• Inquire For Life – Biomarker Campaign

PARTNERS

PROFESSIONAL SOCIETIES
American Clinical Lab Association (ACLA)
American College of Chest Physicians
Association of Community Cancer Centers (ACCC)
Association of Molecular Pathologists (AMP)
College of American Pathologists (CAP)
Oncology Nursing Society (ONS)

PHARMACEUTICAL COMPANIES
AstraZeneca
Boehringer Ingelheim
Bristol-Myers Squibb
Genentech
Merck
Novartis
Pfizer

DIAGNOSTIC COMPANIES
Biooptics
Foundation Medicine
Guardant Health
Myriad

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BIOMARKER TESTING MAKES A DIFFERENCE
Surviving lung cancer should the **EXPECTATION**...

... **NOT** the exception