Improving CT Lung Cancer Screening Through Image Quality Optimization Panel Discussion

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## Example: Growth of Part-solid Nodule

<table>
<thead>
<tr>
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<th>Baseline</th>
<th>3 Months Later</th>
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</thead>
<tbody>
<tr>
<td><strong>Total nodule, Mean Diameter, mm</strong></td>
<td>17.2</td>
<td>19.0 (+1.8)</td>
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<tr>
<td><strong>Solid Core, Maximal Diameter, mm</strong></td>
<td>11.8</td>
<td>14.4 (+2.6)</td>
</tr>
<tr>
<td><strong>Total nodule Volume, mm³ (VDT, days)</strong></td>
<td>1754</td>
<td>2296 (288 days)</td>
</tr>
<tr>
<td><strong>Solid Core Volume, mm³ (VDT, days)</strong></td>
<td>215</td>
<td>305 (224 days)</td>
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**Pathology:** Adenocarcinoma IA2
Smoking and Lung Cancer Mortality in the US from 2015-2065

Lung Cancer In Never Smokers

• TALENT Study (Taiwan): T0 invasive lung cancer detection rate: 255/12,011 = 2.1%, NLST: 1.1%, NELSON: 0.9%
• Non-solid nodules 47%, Part-solid nodules 34%, Solid nodules 19% (solid nodules predominate in smokers)
• Multiple primary lung cancer: 17.9%
• Different etiology: Non-tobacco smoke environmental exposures e.g. ambient air pollution
Personalized Screening

• Risk-based management of lung nodules
• Personalize screening interval to reduce unnecessary screens and reduce missed cancers
• Deep learning algorithms need to consider the effects of different exposures and genetics, never versus ever smokers
• Consistency in image acquisition and measurement as well as stability of image quality over time are critical especially for sub-solid nodules in terms of volume and density measurements, longer duration of follow-up for 5+ years