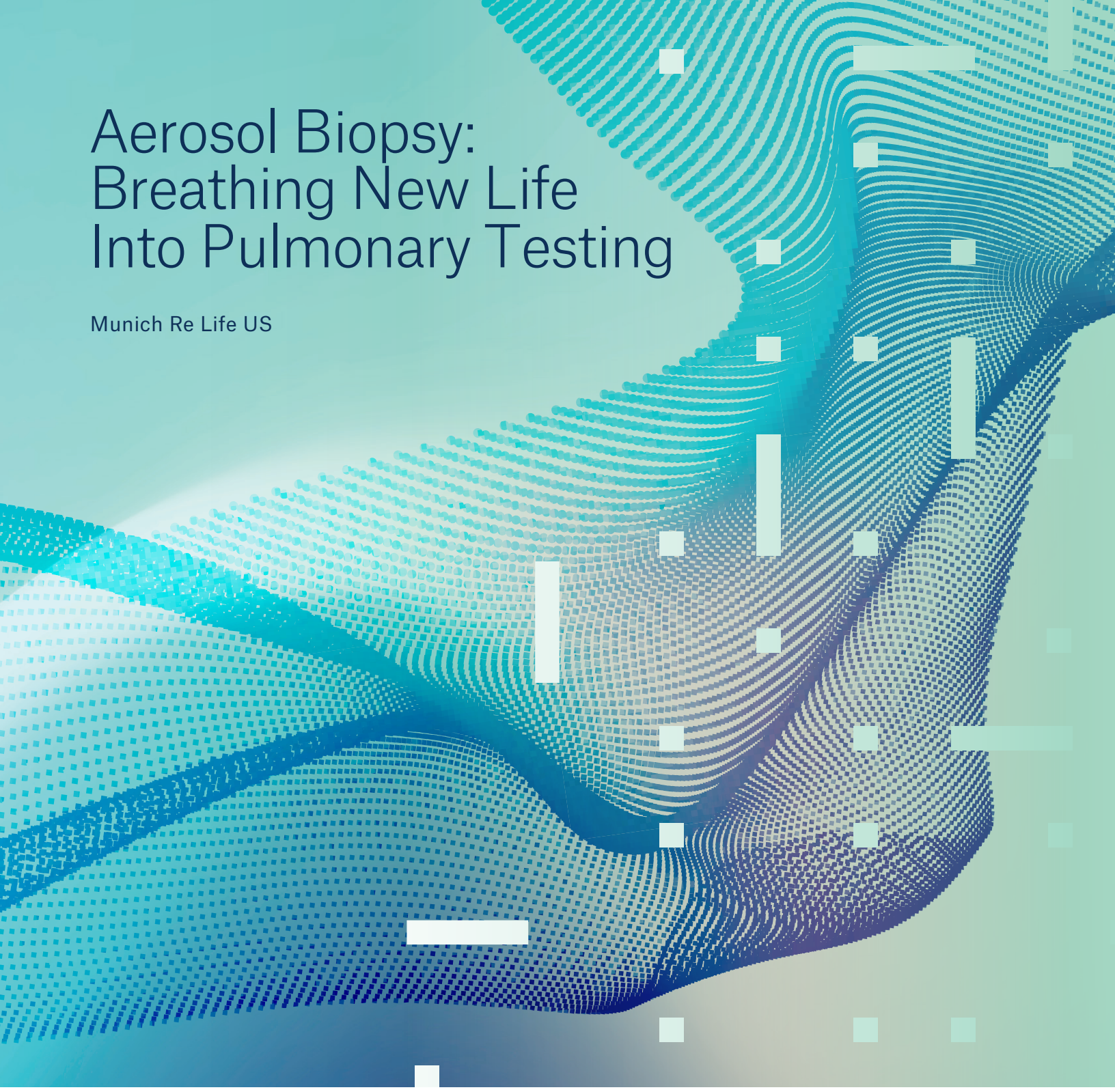
Aerosol Biopsy: Breathing New Life Into Pulmonary Testing

Munich Re Life US



Aerosol biopsy is a new technology intended to simplify the process of diagnosing major lung diseases. By capturing and testing expelled droplets from the lungs, this invention could significantly reduce medical costs and evaluation time. New to the market, the aerosol biopsy could have a profound effect on the medical field and, in turn, the life insurance industry.

Biopsies and bronchoscopies have long been considered the gold standard for diagnosing lung diseases. These procedures, while common, can be costly and complicated. A California company is looking to simplify this process through creation of an alternative technology known as the aerosol biopsy, which utilizes the lung's natural function of coughing out bacteria or particles to gather necessary information in a non-invasive manner.[1,2]

The aerosol biopsy captures the coughed out droplets that originate in the lungs and then extracts the genetic information contained within. The expelled samples, which may contain DNA, are then read by a point-of-care analyzer or sent to a lab.[1]

The aerosol biopsy may allow for a speedier, less costly and non-invasive pulmonary evaluation and possibly even reduce or eliminate the need for the operating room, specialists and anesthesia traditionally required for bronchoscopies and biopsies.3 The procedure takes about 10 minutes to complete.[1]

Potential Uses in the Health Care Arena

- Pneumonia: If used as a point of care test, rather than needing to generate a pulmonology referral, a patient could start a tailored antibiotic therapy for the particular infection quicker. This could save time and trouble for the patient and save costs to the healthcare system.[1]

- Lung Nodules: When a chest CT shows a suspicious lung nodule, the current protocol is to repeat the scan after a certain interval. At that time, a decision would be made to either proceed with a lung biopsy or schedule yet another follow-up CT to ensure stability of the nodule. The hope is that with the aerosol biopsy, a diagnostic finding could be made following the initial scan. With the particles analyzed on-site, cancer cells could either be ruled out or positively identified.[1]

- Cystic Fibrosis: Here is where the aerosol technology has already been tested. One hundred patients from the University of California at San Diego showed a 94% sensitivity in detecting pseudomonas, one of the major bacterial causes of pneumonia in cystic fibrosis.[1]

- Research: The aerosol biopsy may demonstrate further benefit in lung disease research. A current hurdle is being able to secure a healthy control base willing to undergo an invasive lung procedure like a traditional biopsy. As an alternative, the quicker, cheaper and non-invasive aerosol biopsy test would allow samples to be collected without putting volunteers through an uncomfortable procedure. This may prove to be a boon for lung research by vastly increasing the control pool.[1]

Embracement of the Aerosol Biopsy Technology

This new technology was recognized in 2017 by the National Institute of Health (NIH) for addressing a large unmet clinical need and was awarded the NIH Small Business Innovation Research Contract.[4] It is hoped the award winning technology will make diagnosing lower respiratory infections easy, rapid and reliable while paving the way for targeted treatments and better patient outcomes.[4]

Thoughts to Consider

As discussed above, some benefits to the general population may include the following:

- Being able to evaluate lung nodules sooner could either rule out malignancy or allow for immediate biopsy;
- Increasing the baseline pool of healthy control subjects for lung disease research;
- In cases of pneumonia, better determination of the correct choice of antibiotics sooner and more efficiently to attack the infection may lead to quicker recovery and increased cost savings;
- Appreciable savings may be realized by the health care industry in needing to order fewer biopsies and follow-up CT chest scans.

Additionally, there are further factors to consider more specific to the life insurance industry. These may include:

- If approved and successful, could there be a chance that life insurance companies would no longer have to postpone certain applications where lung nodules recently presented?
- What if the commercialization of a successful aerosol biopsy becomes available to the general public? Could this be a potential tool for anti-selection? Imagine if an insured applicant suspected lung cancer, completed the test and was informed to see their physician to discuss abnormal results. The availability of genetic testing in recent years to determine ancestry makes this scenario more plausible.
- Will there be improved mortality resulting from the early detection and resulting treatment of any lung abnormality?

Conclusions

Innovative technology such as the new aerosol biopsy continues to impact the world of health care and the insurance industry. Replacing the gold standard of diagnostic testing for lung disorders with an aerosol biopsy is not a simple task, and future use is uncertain. However, insurance companies should remain informed to see if the aerosol biopsy gains traction in the medical marketplace. Companies should also consider how to assess the pricing and underwriting impact of new technologies such as the aerosol biopsy.

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