With Every Breath

Dr Aminudin Rahman Mohd Mydin
Consultant Clinical & Radiation Oncologist

In conjunction with November being the World Lung Cancer Awareness Month, Dr Aminudin Rahman Mohd Mydin, answers some questions Malaysians often have about lung cancer.

Words **Lim Teck Choon**

What causes lung cancer?

Cancer is a complex disease; there are still many things we have yet to discover about it, including specific causes for cancer. What we do know is that there are certain risk factors that can increase our chances of developing lung cancer.

- **Smoking.** Dr Amin also doesn't recommend vaping. "It's as bad as smoking!" he says.
- **Exposure to secondhand smoke.**
- **Prolonged exposure to asbestos, chromium, arsenic, tar and other cancer-causing pollutants in the environment.**
- **Exposure to radiation.**
- **Family history**

Early stage lung cancer may not show symptoms, and hence is difficult to detect.

Dr Amin recommends visiting a chest or respiratory physician if we experience a cough that doesn't go away after a period of time and/or persistent shortness of breath. Other symptoms to watch out for are chest pains and bloody phlegm.

Can lung cancer be detected early?

Spiral computed tomography (CT) may pick up early lung cancers in some people. It involves the use of X-ray, taken from many different angles, and using a computer to put together these X-ray scans to come up with a 3D visual.

The U.S. Preventive Services Task Force recommends annual screening for lung cancer with low-dose CT in adults between 55 and 80 years who have a 30 'pack-year' smoking history (to calculate pack, multiplying the number of packs of cigarettes smoked per day by the number of years we have smoked), and are currently smoking or have quit within the past 15 years. However, Dr Amin believes that this CT screening technology is not widely available in Malaysia at the moment.

Improving CT scan for better diagnosis.

PET-CT scan combines positron emission tomography (PET) with CT. You will be injected with a glucose solution containing a very low, safe dose of radioactive material, and the PET-CT scan will trace the passage of this radioactive material as it is absorbed by your tissues. Cancer cells will light up under the PET-CT scan, so this method has a better possibility of detecting cancer cells in the lungs. "Think of PET-CT scan as a colour TV, while CT scan is the black and white TV," says Dr Amin.**HT**

Where There's Smoke

Words **Lim Teck Choon**

Dr Aminudin Rahman Mohd Mydin
Consultant Clinical & Radiation Oncologist

Dr Amin emphasizes that smoking is one of the primary risk factors for lung cancer, and for a good reason: there are 250 known chemicals in a single stick that can negatively affect our health, and at least 69 of them can cause cancer.

Non-smokers should be fine, right?

Unfortunately, this is not always the case. Dr Amin points out that lung cancer rates are increasing among people who have never smoked, especially women.

- 10-15% of lung cancer patients are non-smokers; two-thirds of them are women.
- Another 50% are former smokers.
- On average, 20% of all female lung cancer patients have never smoked. The percentage is significantly higher among Asian women.

Secondhand Danger

There is scientific evidence that inhaling secondhand smoke can be just as harmful as smoking.

- It can increase our risk of lung cancer by as much as 30%, as well as make us more vulnerable to other lung diseases.
- It can also raise our low-density lipoprotein cholesterol ("bad cholesterol") and increase our risk of heart problems.
- Children are especially vulnerable to secondhand smoke. In addition to the above, it can also increase the risk of sudden infant death syndrome, respiratory infections (bronchitis, pneumonia, etc) and ear infections. It can also worsen any existing asthma.

This is why we need to quit smoking!

"For smokers who quit, within 10 years their risk of getting lung cancer drops to about the same amount as if they had never smoked," says Dr Amin.

Dr Amin recommends the following to those of us who need some help in quitting the habit:

- Get help from a smoking cessation clinic (found at most government as well as private medical establishments). Smoking cessation clinics provide nicotine replacement therapy, psychological support, and in select cases, medications to help ditch the habit.
- Find support. Support groups can be found at smoking cessation clinics as well as online. **HT**

Reference: National Cancer Institute. *Harms of cigarette smoking and health benefits of quitting.* Retrieved on September 27, 2017 from *https://www.cancer.gov/about-cancer/causes-prevention/risk/tobacco/cessation-fact-sheet*

Treatment for Lung Cancer

Words **Lim Teck Choon**

Traditionally, lung cancer is treated using a combination of surgery, radiation therapy and chemotherapy. They are still very useful today. Recently, we have several more treatment options that, when used in combination with the 'old school' treatment options, offer better results in improving the life expectancy and quality of life of people with lung cancer.

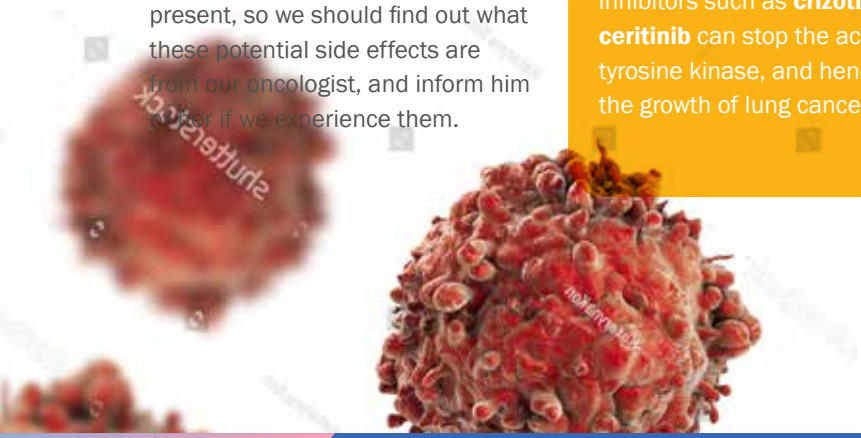
A MORE TARGETED APPROACH

Targeted therapy involves the use of biologics, medications that are made from natural sources (genetic materials, proteins, etc).

- Chemotherapy drugs are like grenades – tossed into an area, they take out both cancer cells as well as normal cells nearby. As a result, patients may experience side effects.
- Biologics on the other hand target only molecules or substances that affect cancer cells. Therefore, they work in a more precise manner, with fewer side effects compared to chemotherapy medications.
- However, side effects may still be present, so we should find out what these potential side effects are from our oncologist, and inform him sooner if we experience them.

EGFR+ lung cancer. In Asia, 51.4% of patients with NSCLC had a mutation in a gene called EGFR. This mutation is especially prevalent among female and non-smoking patients. People with this mutation has protein structures called epidermal growth factor receptors (EGFRs) on their cells. These receptors can bind to specific proteins to trigger uncontrollable growth of cancer cells. Biologics called EGFR inhibitors such as gefitinib, erlotinib, afatinib and osimertinib help inhibit the growth of these lung cancer cells by stopping the binding of these proteins to the EGFRs.

ALK+ lung cancer is caused by a mutation in our ALK gene. This mutation causes our body to produce an enzyme, tyrosine kinase, that can cause the growth of cancerous cells. ALK inhibitors such as **crizotinib** and **ceritinib** can stop the action of tyrosine kinase, and hence inhibit the growth of lung cancer cells.



Dr Aminudin Rahman Mohd Mydin
Consultant Clinical & Radiation Oncologist

Immunotherapy: a new paradigm in lung cancer treatment?

Dr Amin explains that immunotherapy, a type of targeted therapy, involves the use of medications that harness our immune system to recognize and kill cancer cells. It has been shown to be a promising option to treat non-small cell lung cancer (NSCLC). Immunotherapy medications include:

- **Pembrolizumab** and **nivolumab** block a protein called PD-1 from interacting with T-cells. PD-1 prevents these T-cells from recognizing and eliminating cancer cells. With PD-1 out of the way, T-cells can now perform their job.
- **Atezolizumab**, a relatively new medication, blocks the action of another protein called PD-L1. PDL-1 prevents cancer cells from dying naturally, so this medication, and this medication reverses that effect. You can discuss this medication further with your oncologist.

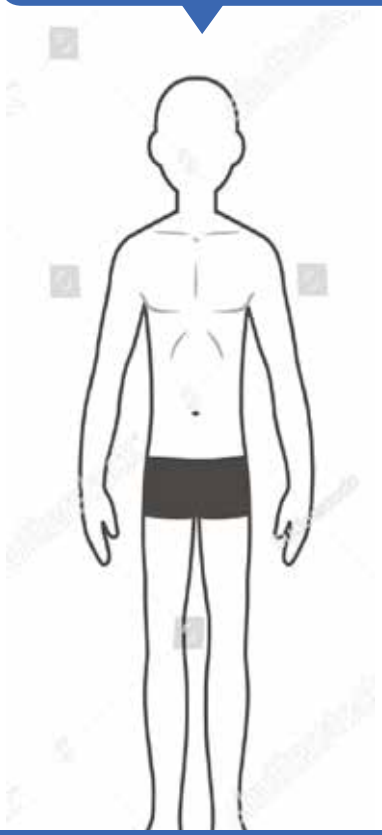
The use of immunotherapy medications sees many patients with advanced lung cancer have longer-lasting remission periods. Some of Dr Amin's patients are still alive and well five years later! **HT**

Nutrition Makes a Difference

Words **Lim Teck Choon**

People with cancer still need to eat, but the effects of cancer on their health and physical fitness may make it challenging to eat enough in order to obtain sufficient nutrients. Furthermore, Dr Amin points out that food-related taboos still exist. "Even though most of these taboos have no basis in science, many people still follow them, and doing so puts them at risk of not receiving enough important nutrients."

Do you know? About 45% of lung cancer patients experience malnutrition.[1]



Cachexia and cancer patients

Cachexia is a term used to describe a condition in which a person experiences loss of weight, muscle wasting (atrophy), fatigue, weakness, and significant loss of appetite. There is no denying the serious effects of cachexia.

Reduced quality of life. Weight loss and muscle waste as well as fatigue and weakness will hamper the person's ability to move and perform ordinary daily functions, thus reducing his or her quality of life.

Increased risk of side effects and possibly poorer treatment outcome. A study on patients with Stage IIIB and Stage IV (advanced) lung cancer found that lower body mass is linked to increased risk of toxic side effects such as reduced levels of haemoglobin in red blood cells, neutrophils and platelets (haemotological toxicity) – which in turn can give rise to problems such as anaemia, problems in blood clotting and weakened resistance to infections.

Is there anything we can do about this?

Yes. The European Society for Clinical Nutrition and Metabolism stated the following in their ESPEN guidelines for cancer patients who are not on end-of-life support:

- If a patient shows signs of malnutrition, nutritional invention will be offered to ensure that the patient increases his or her intake of nutrients. This intervention will include counselling by a dietitian, offering high energy and/or high protein oral nutritional supplement to the patient and treating symptoms of malnutrition.
- Regular physical activity will be prescribed as part of the intervention, as exercise builds muscles and helps strengthens the body to aid recovery from malnutrition.
- Sometimes, medications may be prescribed to treat cachexia, but study has found that the best ways to overcome it are still diet and exercise.

If we have concerns about the types of food that should (or should not) be eaten by someone with lung cancer, Dr Amin recommends consulting a dietitian for solid, science-backed advice. **HT**

References: 1. Sjøblom, B., et al. (2015). Low muscle mass is associated with chemotherapy-induced haematological toxicity in advanced non-small cell lung cancer. *Lung Cancer*;90(1):85-91. doi: 10.1016/j.lungcan.2015.07.001. **2.** Arends, J., et al. (2017). ESPEN guidelines on nutrition in cancer patients. *Clin Nutr*; 36(1):11-48.