1.8 Assignment: Is it cancer?

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1. Cancer Selection

I have decided to concentrate on lung cancer for this assignment. Lung Cancer is a major Global Health concern, which is frequently linked to smoking and strikes because of radon, second-hand smoke and air pollution (Gristina et al. 2023). It starts in the lungs because of aberrant cell proliferation and can extend to various body areas. Dyspnea, chronic cough, chest pain and blood in the cough are possible symptoms. Enhancing patient outcomes depend on early identification using imaging testing such as X-rays and CT scans as well as advances in the treatment including chemotherapy, targeted therapy, radiation therapy, surgery and immunotherapy (Casagrande et al. 2023).

2. Fictitious Patient Demographics

Name: Emily Johnson
Age: 62
Occupation: Retired factory worker who has previously worked in a production facility where asbestos and other hazardous substances were present.
Gender : Female
Family history: Smokers for a long time, both parents died of lung cancer. Emily also has two elder siblings who were also given the diagnosis of lung cancer.
General Lifestyle: Ten years ago, Emily gave up smoking, having smoked for forty years. She moved away from smoking, but she still lives in the town where smoking is common, so she

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occasionally meets second-hand smoke. Emily also spent more than 30 years working in the poorly ventilated factor, which raised the risk of lung cancer from the repeated exposure to the asbestos and other toxins. Her diet is deficient in the fruit and vegetables and heavy in the processed foods, which may be impairing the immune system's capacity to fight off the cancer cells and causing general health problems. Emily also has a sedentary lifestyle and gets little exercise, which makes her more vulnerable to lung cancer.

3. Health record Portfolio

a) Biological Diagram of the Biopsy Tumour Cell

The diagram has provided for highlighting the cellular anomalies typical of lung cancer using lung tumour cells taken from the biopsy. Each cell should have features that indicate the malignant growth including enlarged size, aberrant nuclei, and crowded appearance (Yang et al. 2023). The illustration should how the cancer cells attack surrounding healthy tissues:
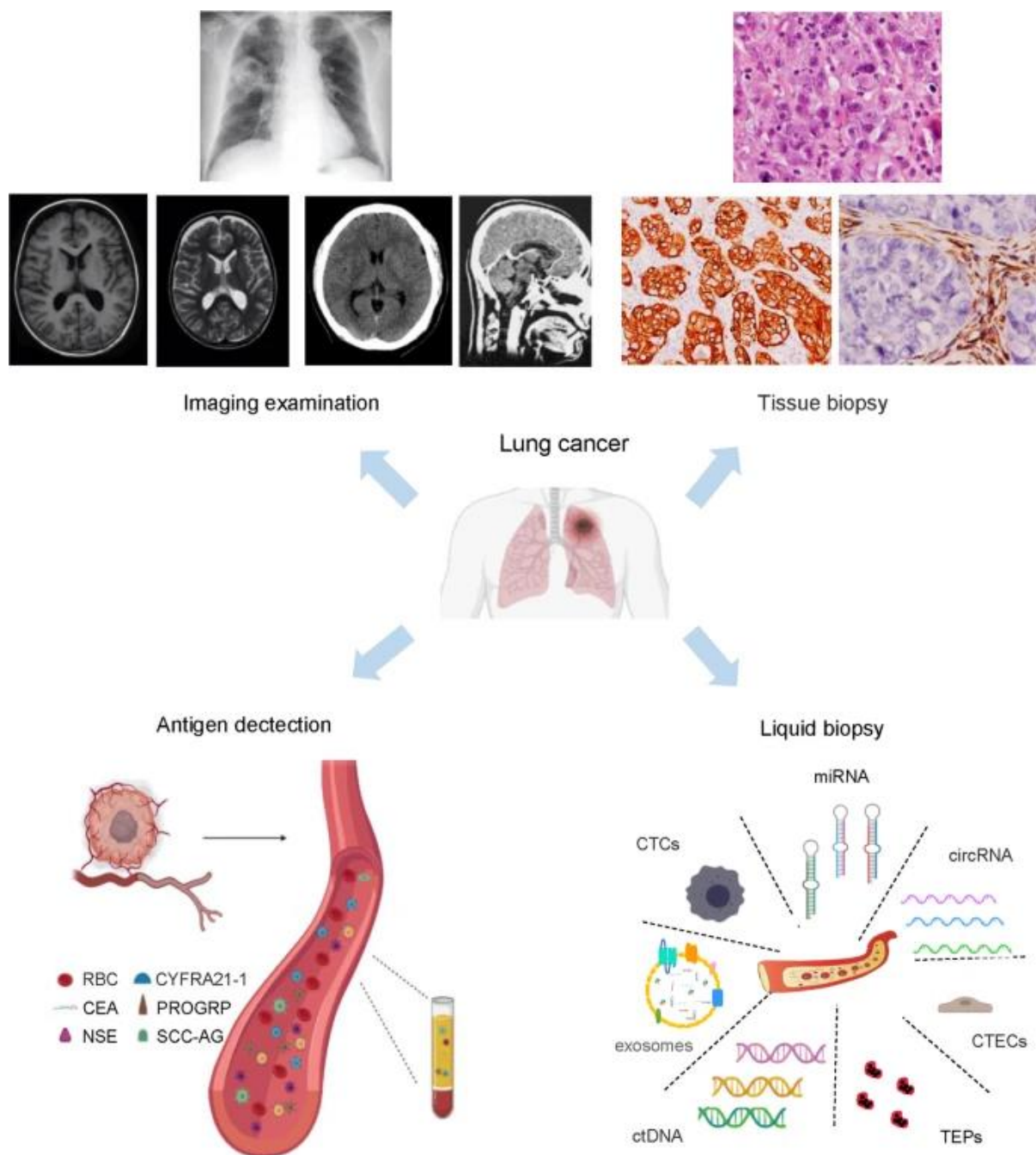
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Figure 1: Diagram for Lung cancer

(Source: Raez et al. 2023)

The biopsy method has allowed for monitoring of the tumour, which has made Tumour tissue specimen through the clinic (Raez et al. 2023). The potential technique for identifying individuals who have a high chance of the disease progressing after the curative surgery is defined as liquid biopsy.
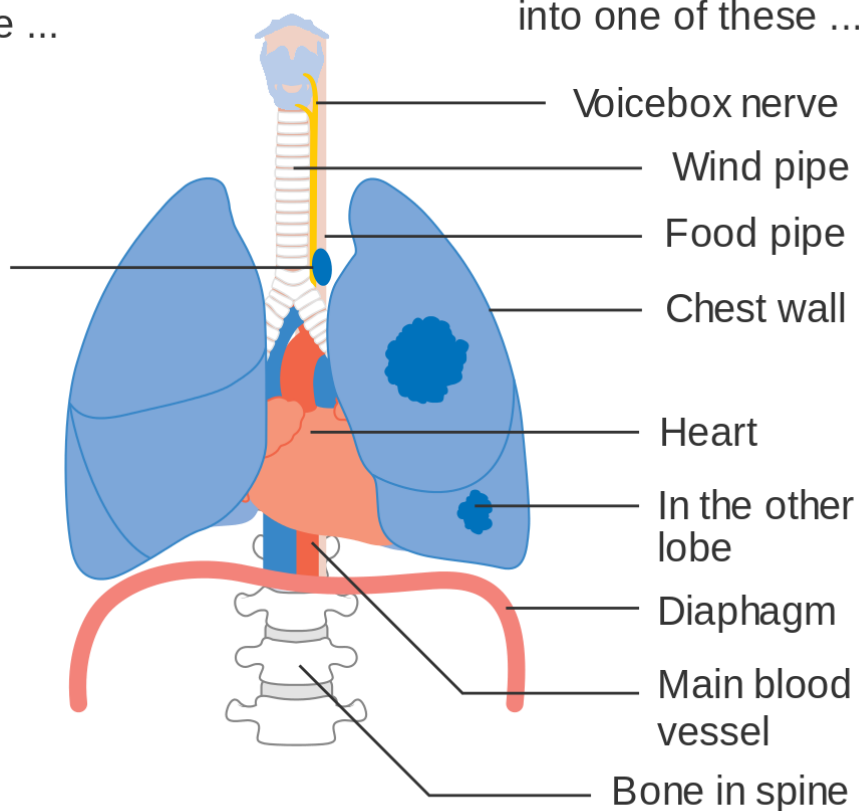
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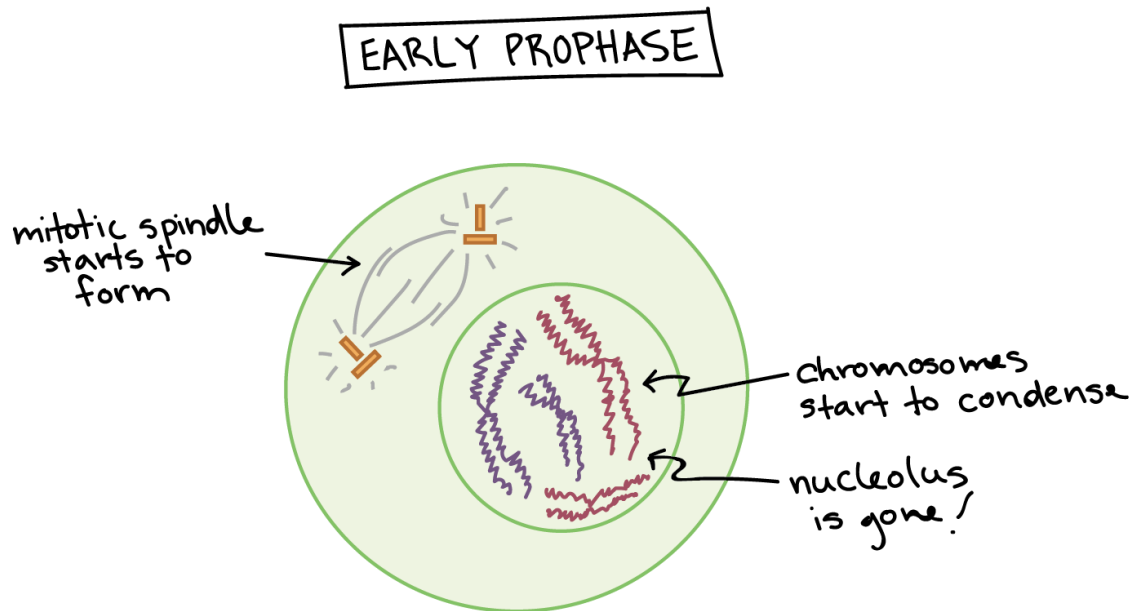

Figure 2: Showing Stage of Lung over

(Source: Created by author)

An intricate perspective of lung cancer cells going through mitosis is shown in the diagram. The diagram takes up the most of the page. For accuracy, computer design software is used to construct the diagram. Instead of using shade to convey contrast between various cell sections, stippling is used. It can also be used for the long term monitoring of the course of the disease and effectiveness of the therapy. In addition, such biopsy technique is the prospective replacement for tumour specimens of tissues in clinical settings because it enables real-time tumour monitoring. The figure should faithfully depict the phases of division in cancerous pulmonary cells, highlighting characteristics such centrioles as spinner
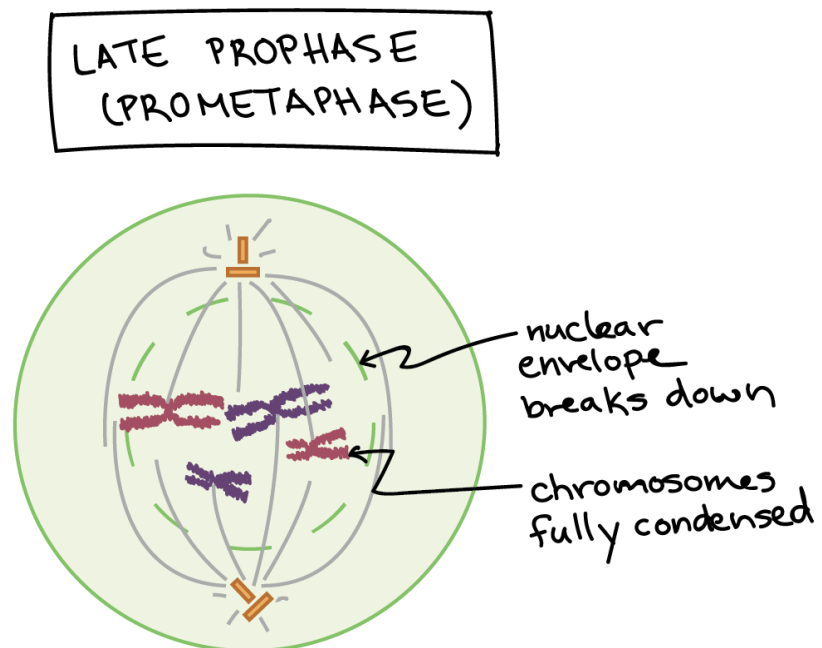
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fibres, packed genomes, and cellular membrane components. Ten cells are discussed as follows:
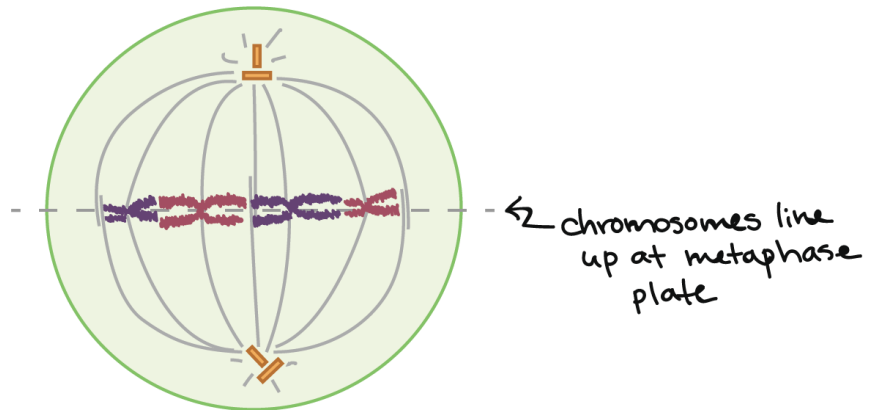
- Prophase

- Prometaphase

- Metaphase

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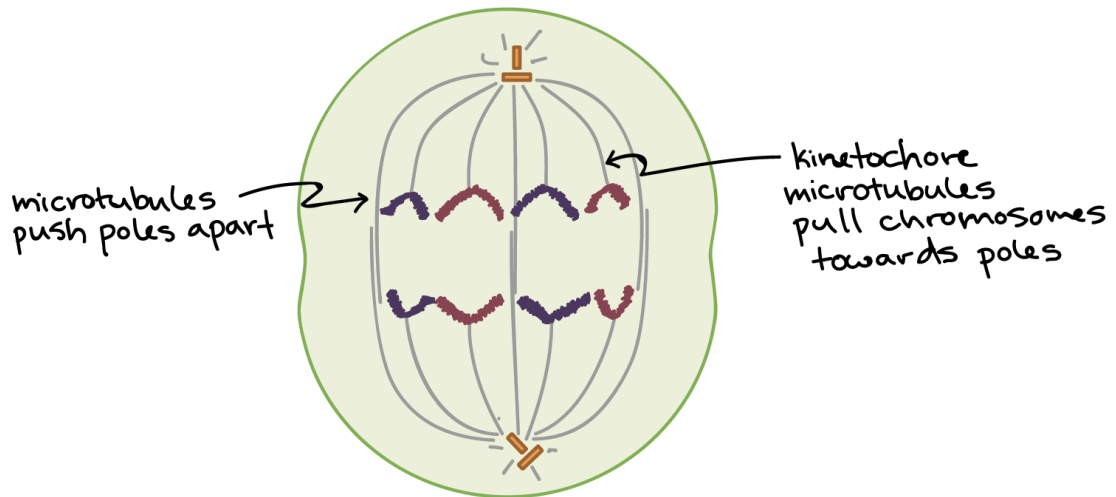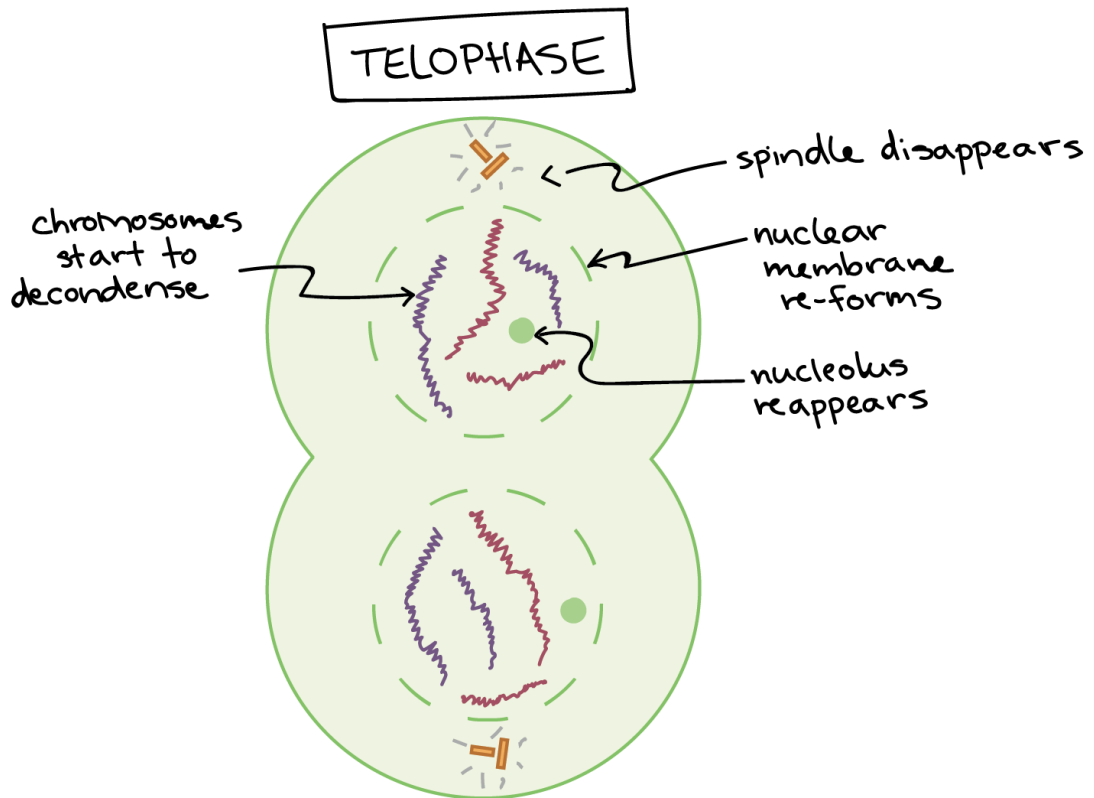
METAPHASE

← chromosomes line up at metaphase plate

- Anaphase

ANAPHASE

microtubules push poles apart →

kinetochore microtubules pull chromosomes towards poles

- Telophase

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- Cytokinesis

- Prophase

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EARLY G₁

cytokinesis
complete

identical
daughter
cells

- Metaphase

Centrosome
(spindle pole)

Nuclear
vesicle

Polar
microtubule

Metaphase
plate

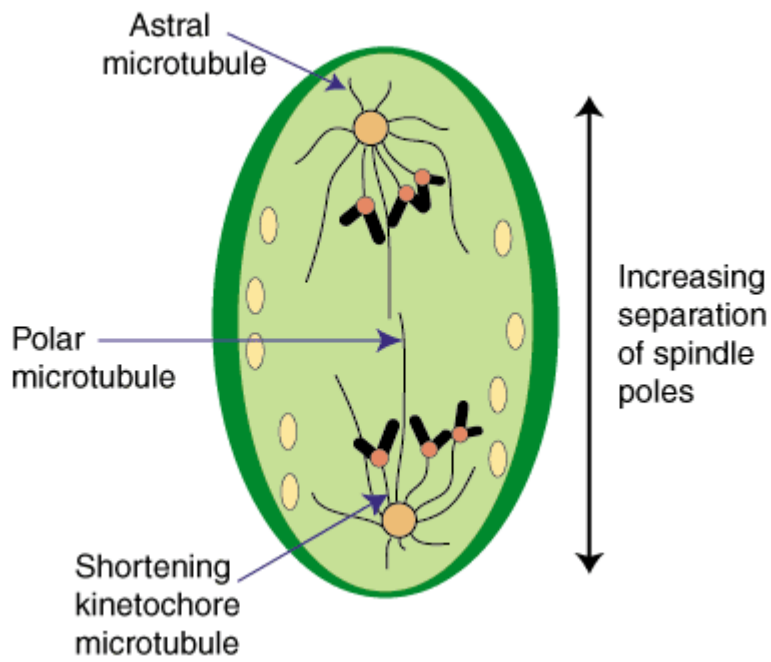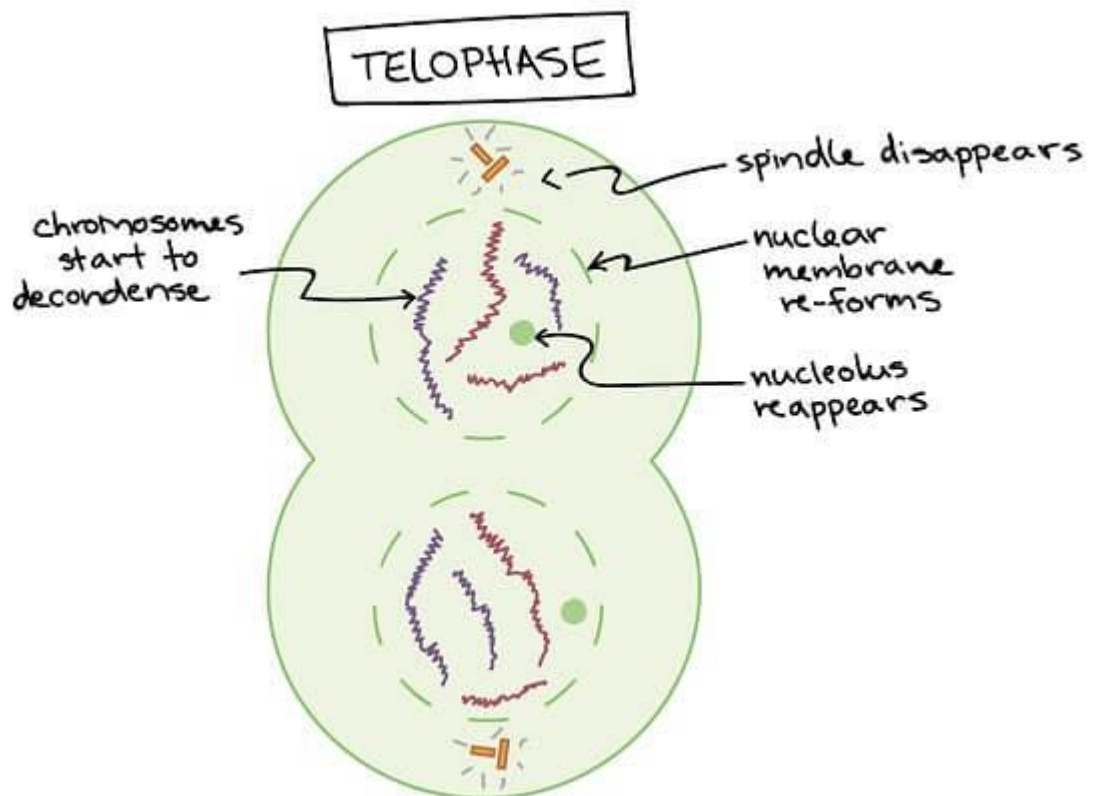Kinetochore
microtubule

Kinetochore

Astral
microtubule
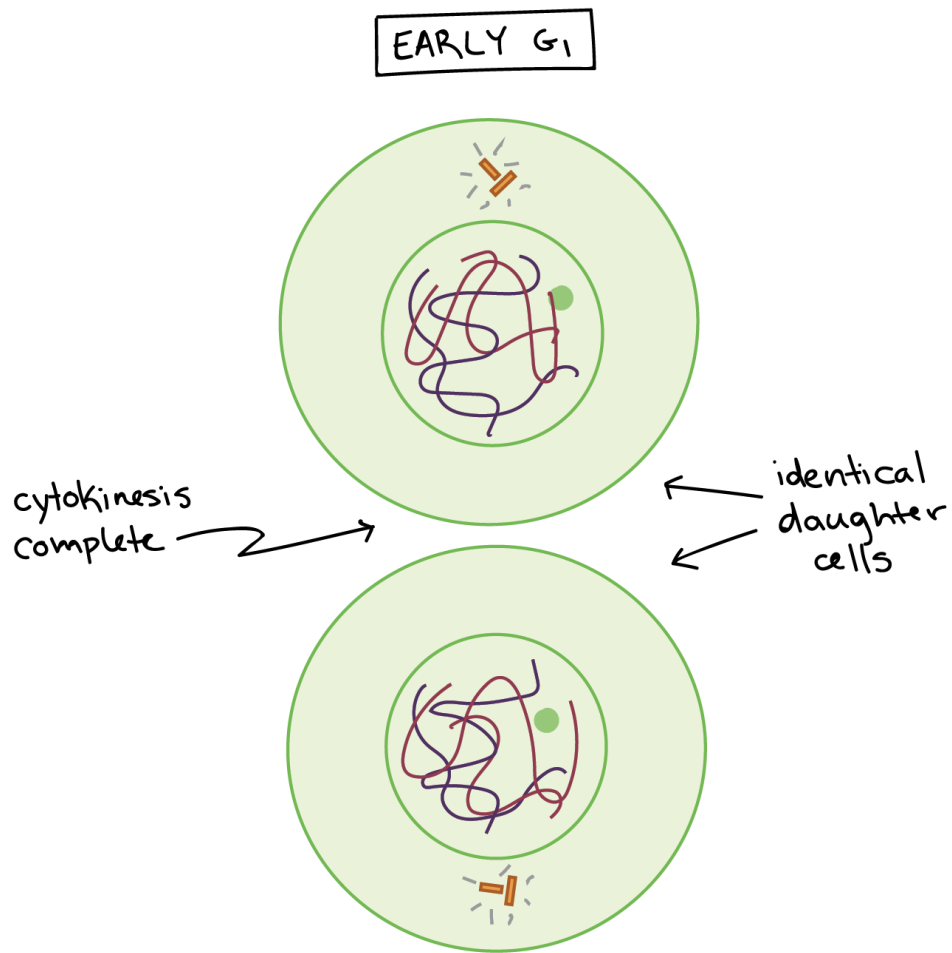
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- Anaphase

- Telophase

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b) Side by side imaging Comparison

MRI (Magnetic Resonance Imaging)

Magnetic resonance imaging or MRI creates a finely detailed image of the internal body structure by using the radio waves and strong magnets. The MRI can produce the high-resolution images of such a chest, which can be used to diagnose lung cancer by identifying the tumours and abnormal growth. MRI may reveal a small, localised lump within its lung tissue at the early stage of lung cancer (Kemper et al. 2023).
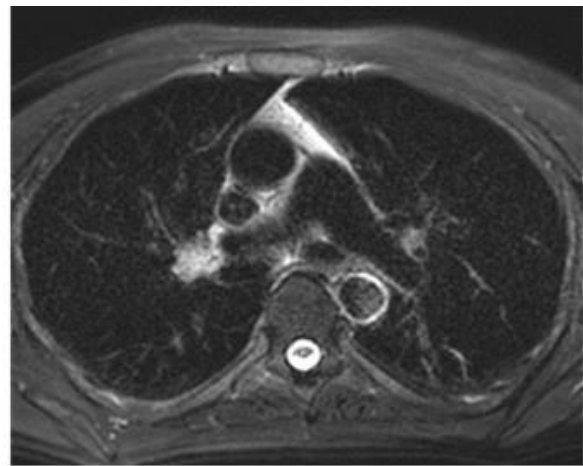
(a) (b)

Axial CT scan demonstrates lymph node in right hilus and Axial T2 has shown hypersignal which has suggested metastatistic disease.

X-ray

Electromagnetic radiation is used in X-ray imaging to create images of the interior structures (Visser et al. 2023). An x-ray is frequently performed early in the process of detecting lung cancer and may lead to additional testing if needed.

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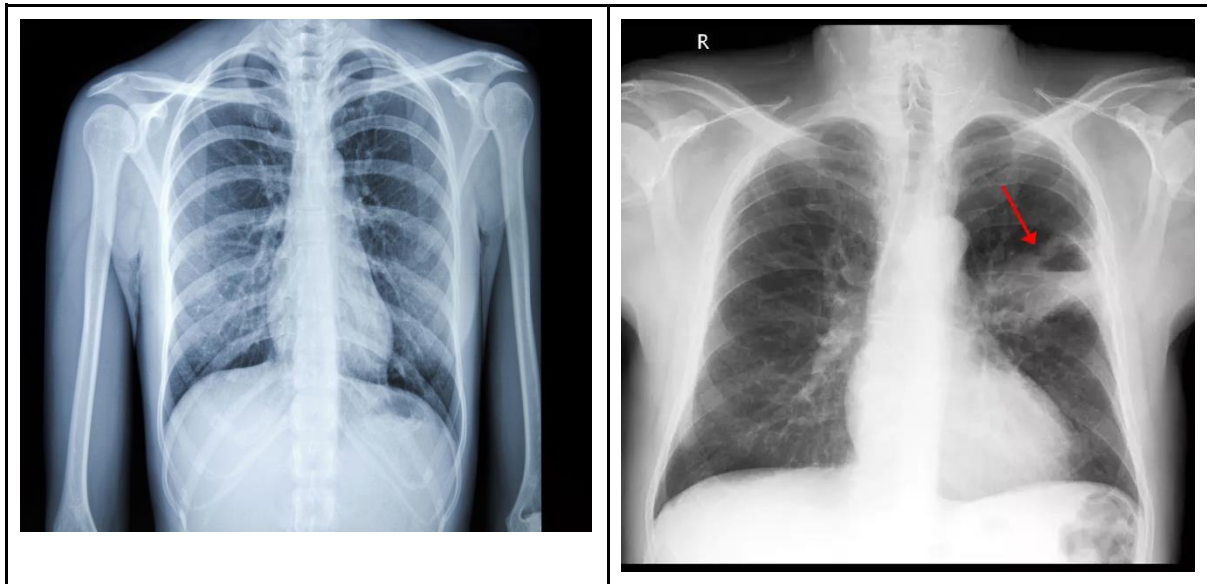The radiographer may ask you to change into a hospital gown when you get your x-ray, and she may ask women to take off their bras because underwire and metal clips can appear on the image. Every X-ray takes a very short while and causes no pain. Typically, multiple x-rays obtained from various angles are required. Every x-ray must be taken while you remain motionless and may be requested to hold your breath for a short period.

C) Report for Physician on Possible Cause of the Lung Cancer

Lung cancer may arise due to a variety of factors, including genetics, lifestyle, and environmental factors (Maansson et al. 2023). Environmental factors such as smoke exposure, air pollution, and radon significantly raise the risk of the lung cancer. Patients need to be conscious of these possible risks in order to reduce the risk of developing the lung cancer. They should also adopt the preventive measurements such as giving up smoking and minimising their exposures to the environmental toxins.

Genetics Factors:

- Certain genetic mutations make people more likely to develop lung cancer.
- A family connection to lung cancer might increase risk.

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- Predisposition to diseases interacts with external factors.

Lifestyle Factors:

- Tobacco usage, including tobacco products such as cigarettes, cigars, or pipes, is the primary cause.

- Secondhand smoking also considerably increases danger.

- A poor diet low in vegetable and fruit consumption may contribute to the development of lung cancer.

Environmental Factors:

- Air pollution, which includes pollutants from automobiles and industrial operations, heightens risk.

- Absorption to chemical products including asbestos and uranium has been linked to an increased incidence.

- Radon gas, an unstable substance present in buildings, dwellings, and soil, poses a substantial concern.

d) The prognosis

Dear Emily Johnson,

A complete therapy regimen has been devised as a reaction to the scenario that has arisen as a result of a finding of lung cancer. This process incorporates a number of different cancer treatments as components. These treatments are incorporated in the procedure. Among these therapies are chemotherapy, radiation, surgery, and specialised treatment. Further therapies include focused therapy. The aspects that have been produced represent the parts that were constructed as part of the therapy strategy that has been developed. These constituents, when combined, constitute the different parts of the process. Your reaction to the therapy, as well

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as the manner in which they are successful in completing the task of building the plan, are all going to be taken into consideration prior to arriving at an assessment about the forecast. This will be done in order to arrive at a conclusion. As a component of the procedure, this will be carried out. In the unlikely scenario that you are enabled to have complete faith that our team is committed to providing assistance to you during every stage of this journey, then you will definitely be able to possess comprehensive assurance regarding our team. You are able to perform out that particular activity to the utmost of your ability according to your individual capabilities.

Best regards,

Physician Name

Physician title

Clinic Name

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