

How is cancer staged? – Video Transcript

In this video we will explain the relationship between metastasis and cancer staging for solid tumours. We will introduce a standardized staging system for cancer, known as the TNM cancer staging system, describe each component and end with showing different examples of various solid tumours using the TNM scale.

If you would like to review our lesson on ‘how does cancer spread’, which covers the whole metastatic process in greater detail, please consult the links available below.

Cancer staging is a way for doctors to describe the size and spread of tumours. There are several systems for grading different types of cancer, but one of the most widely used is the TNM staging system for solid tumours.

TNM stands for tumour, node and metastasis. It is a standardized scale that provides a detailed description of how far cancer has spread. This system helps doctors understand how aggressive the cancer is so that they can plan the best treatment and assess a patient’s prognosis.

Now, let’s break down the TNM system to learn what each part represents:

T for Tumor: This refers to the size of the primary tumor. Tumor size is usually measured in centimeters and can have a value ranging from 0 to 4:

- T0 means there is no evidence of a primary tumor.
- When a primary tumour is present, T1-T4 indicates the size of the tumour.
- For example, T1 refers to a small, localized tumor, while T4 indicates a large tumor. T4 tumours may be so large that they have grown into nearby tissues.

When looking back to the metastatic process, we can now see that the ‘T’ describes features of the primary tumour as well as the local invasion status.

N for Nodes: This describes whether the cancer has spread to nearby lymph nodes. Lymph nodes are small, bean-shaped structures that are part of the body’s lymphatic system, and can have a range from 0-3:

- N0 means no regional lymph node involvement.
- N1-N3 indicates increasing involvement of lymph nodes.
- For example, N1 might mean a few cancerous nodes close to the tumor, while N3 indicates more extensive lymph node involvement.

M for Metastasis: This indicates whether the cancer has spread to other parts of the body and can only have one of two values:

- M0 means there is no metastasis.
- M1 means there is metastasis present, indicating that the cancer has spread to other organs or distant lymph nodes.
- Looking at the metastatic process again, we can see that the ‘M’ is related to the formation of secondary tumours

Let's look at some examples of various tumours and their characteristics related to their TNM staging:

Example 1: T2 N1 M0

- T2: The tumor is moderate in size and/or has grown into nearby tissues.
- N1: There is some cancer involvement in nearby lymph nodes.
- M0: There is no metastasis.

Example 2: T4 N3 M1

- T4: The tumor is large and/or has grown extensively into nearby tissues.
- N3: There is extensive lymph node involvement.
- M1: The cancer has spread to distant parts of the body.

Now try this example on your own: What are the characteristics of this TNM classification?

- T3 N2 M0
- T3: Large tumor
- N2: Moderate lymph node involvement.
- M0: No metastasis.

Now that we understand how the TNM system works, let's identify which cancers can be graded using this method:

As mentioned earlier, this method is mostly used for solid tumour cancer cases. The types of tumours that are graded using the TNM system include:

- Breast
- Lung
- Colorectal
- Prostate
- Head & Neck
- Esophagus
- And lastly, Melanoma

We should note that not all cancers are graded using the TNM scale. These cancers may use unique staging systems that are tailored to their specific characteristics. Leukemia and multiple myeloma are examples of blood cancers, which each have their own staging system.

In Summary:

- The TNM system is an essential tool in cancer diagnosis and care that offers a standardized way to describe the progression of the disease.
- By breaking down the components of Tumor, Nodes, and Metastasis, doctors can tailor treatment plans and provide better care for their patients.

If you enjoyed this video and would like to learn more about molecular pathology and cancer, please take a look at our online catalogue!