Diagnostic Testing

Because prevention of cancer is not always achievable, the initial detection of the disease is the next best approach to reduce cancer mortality rates. To help achieve this, the American Cancer Society suggests a succession of screening procedures and evaluations depending on age, gender, and risk for certain cancers. When cancer is suspected, the initial diagnostic principle is that sufficient tissue must be obtained to determine the diagnosis. Because the therapy used for each type and subtype of cancer is often particular to that type or subtype, every effort must be made to obtain appropriate tissue samples even if treatment is delayed for a short time. The process of obtaining a sample of tissue is called a biopsy.

The following diagnostic principle is to establish the degree of spread of the cancer, also acknowledged as staging. For example, in leukaemia, staging can be achieved through regular history and physical examination, laboratory tests, chest X-ray, and bone marrow biopsy. With solid tumours, computed tomography (CT) and magnetic resonance imaging (MRI) in combination with a biopsy are often required to determine the size of the tumour and the extent of its spread. The degree to which the cancer has spread is reflected in its stage, which guides the type of treatment most appropriate for the patient. An example of a staging system is shown in **Table 1**. Each cancer has a staging system exclusive to itself, one that takes into consideration pathogenic features, the modes of spread, and the curability of the disease.

Table 1. Tissue Nodal Metastasis (TNM) Classification System for Breast Cancer.

Tumour Size (T)	Nodal Involvement (N)	Metastasis (M)
Ts = in situ	NO = no nodal metastasis	MO = no distant metastasis
T1 = <2 cm	N1 = movable axillary nodes	M1 = distant metastasis
T2 = 2-5 cm	N2 = fixed axillary nodes	
T3 = >5 cm	N3 = internal mammary nodes	
Note: These TNM categories are combined to give the stage (e.g., stage 1 = T1 NO MO).		