Welcome to this NDRS training module, which has been designed as a quick guide to TNM Staging

TNM Staging 101: What is Stage?

Stage is an assessment of how far a tumour has spread. A patient can and will be staged at many points within their pathway from diagnosis, pre-treatment, post-treatment and in follow-up

It's important to assess the stage of a cancer as it tells the clinical team how far that cancer has spread. For clinical purposes, a cancer may be staged at many different points in the pathway.

TNM Staging 101: What is Stage?

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The Principles of using a staging system

Enables the practice of classifying cancer cases into groups according to their anatomical extent at the point of diagnosis. It is extremely important as it;

- Helps the clinician in the **planning of the treatment**
- Gives an indication of the **prognosis for survival** for primary tumours
- Assists in the evaluation of the results of the treatment and outcome analysis
- Supports cancer-controlled activities
- Helps with the development and implementation of **clinical guidelines and policy**

Clinically, a staging system is used to plan the patient's care, to indicate the likely prognosis, and to evaluate the effectiveness of certain treatments. Knowing the stage is also important when developing and implementing clinical guidelines.

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For COSD, TNM stage is collected for invasive new primary cancers and only at the point of diagnosis

However, for the purposes of COSD, TNM stage is collected only for invasive new primary cancers and only at the point of diagnosis

TNM Staging 101: TNM System

The most widely used system for determining stage is the TNM system:

T*(n)*	Tumour	An assessment of the **tumour size** and/or **growth** through local tissue *Typically graded 0 – 4, for example **T1***
N*(n)*	Nodes	An assessment of spread to local and regional **lymph nodes** *Typically graded 0 – 3, for example **N2***
M*(n)*	Metastasis	An assessment of distant (**metastatic**) spread of the disease *Typically graded **0** or **1**, for example **M0***

Most solid tumours are staged using the TNM system. Higher numbers generally indicate a larger Tumour, more (or more distant) lymph Nodes or the presence of Metastases.

TNM Staging 101: Stage Grouping

Once the values for the T, N and M have been determined, they are combined and an overall stage is assigned. The TNM can be categorized into an overall stage grouping between 1 to 4, which is often referred as roman numeral staging I, II, III, and IV. This stage grouping describes the progression of the cancer

Stage 0	Stage I	Stage II	Stage III	Stage IV
Carcinoma in situ Early form	*Localised*	*Localised / Early locally advanced*	*Late locally advanced*	*Extensive / Metastasised*

Example of **stage grouping** for a primary breast tumour

- Tumour is less than 2 cm across
- No lymph node involvement
- Has not spread to distant parts of the body

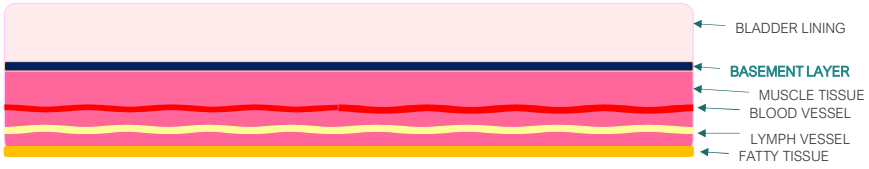
T1	N0	M0	Stage I *Localised*

Full TNM stages are often described as being in a particular group stage as a shorthand method of describing the spread of an invasive cancer. For instance, a **localised** invasive cancer would be classified as Group stage 1.

TNM Staging 101: In-situ vs Invasive

- For solid epithelial tumours, the difference between a D coded in-situ tumour and a C coded invasive cancer is the basement layer

- Composed mostly of basal cells, this forms the boundary between the epithelial (surface) cells on one side and the layers of muscle tissue (with blood and lymph vessels) on the other

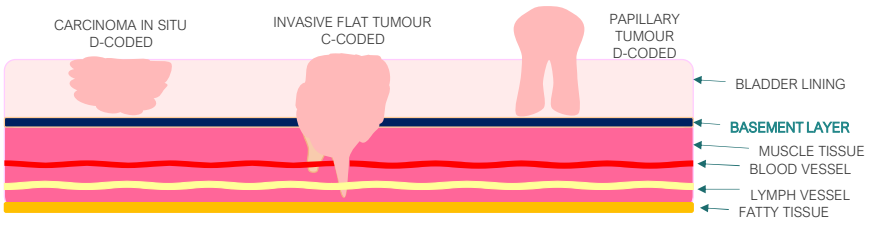


Not **all** solid tumours require a stage because not all solid tumours are invasive – some tumours of epithelial cells are in-situ. Epithelial cells happen on surfaces and those surfaces may be on the outside or the inside. What's shown here is a cross section of the inside of the bladder showing the epithelial cells in pale pink. For solid epithelial tumours, the key difference between D coding and C coding is something called the basement layer. This lies between the epithelial cells on the surface and the layers of muscle with blood- and lymph-vessels underneath

TNM Staging 101: In-situ vs Invasive

- Tumours that have not broken through the basement layer are usually deemed to be in-situ and would be coded with a D prefix in ICD10

- Once a tumour has broken through the basement membrane and has access to the vascular and lymph vessels, it can travel to other parts of the body and is classified as an invasive cancer. Invasive cancers are coded with a C prefix in ICD10



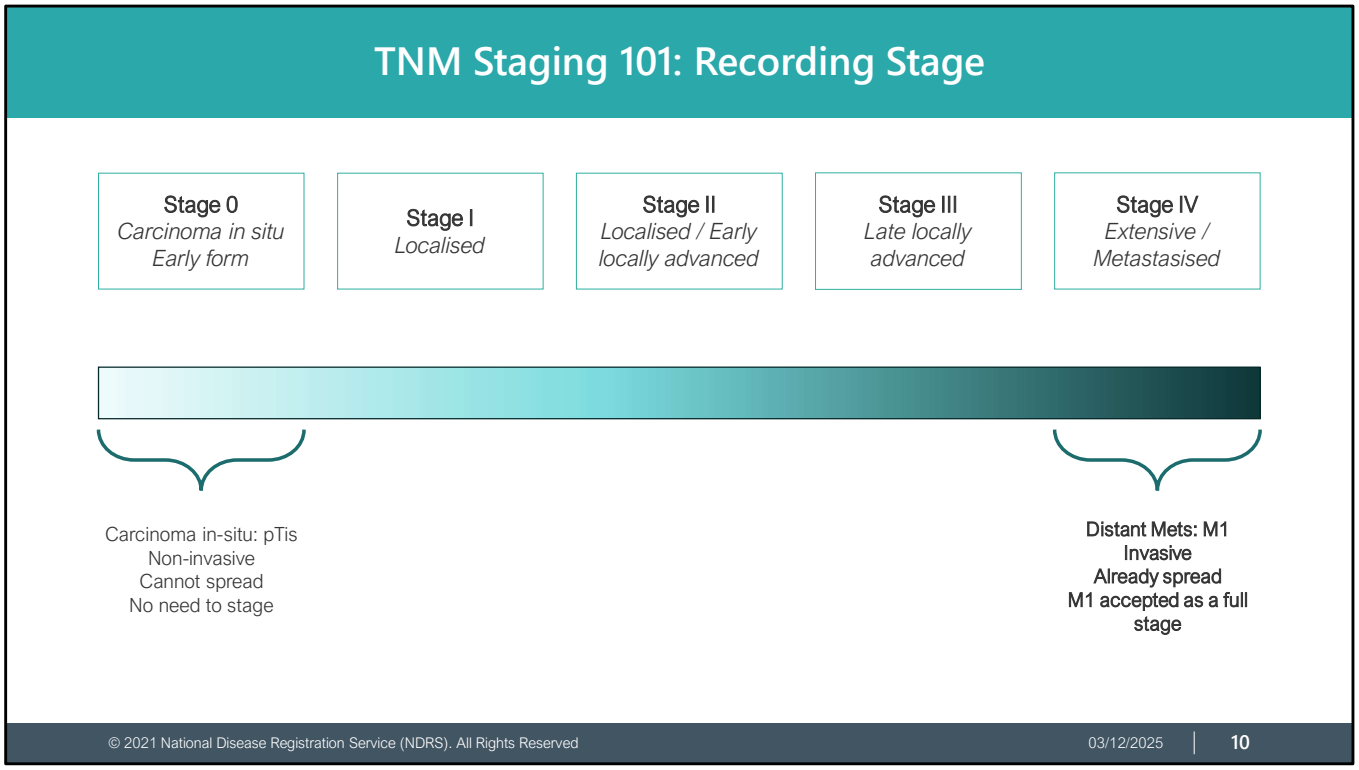
Where an epithelial tumour has **not** broken through the basement layer, it's classified as in-situ and is D coded in ICD10. Cancers that **have** broken though this basement layer can access a transport system in the form of those blood and lymph vessels meaning that cancer cells can travel to other parts of the body where they can form secondary tumours. Tumours *with* access to the transport systems are deemed to be invasive and are C coded. It's worth mentioning that the tumour cells in both the D coded and C coded examples may be exactly the same, they may both be squamous cell carcinomas, the only difference being the access to a transport system - making one a squamous cell carcinoma **in-situ** and the other an **invasive** squamous cell carcinoma.

TNM Staging 101: Recording Stage

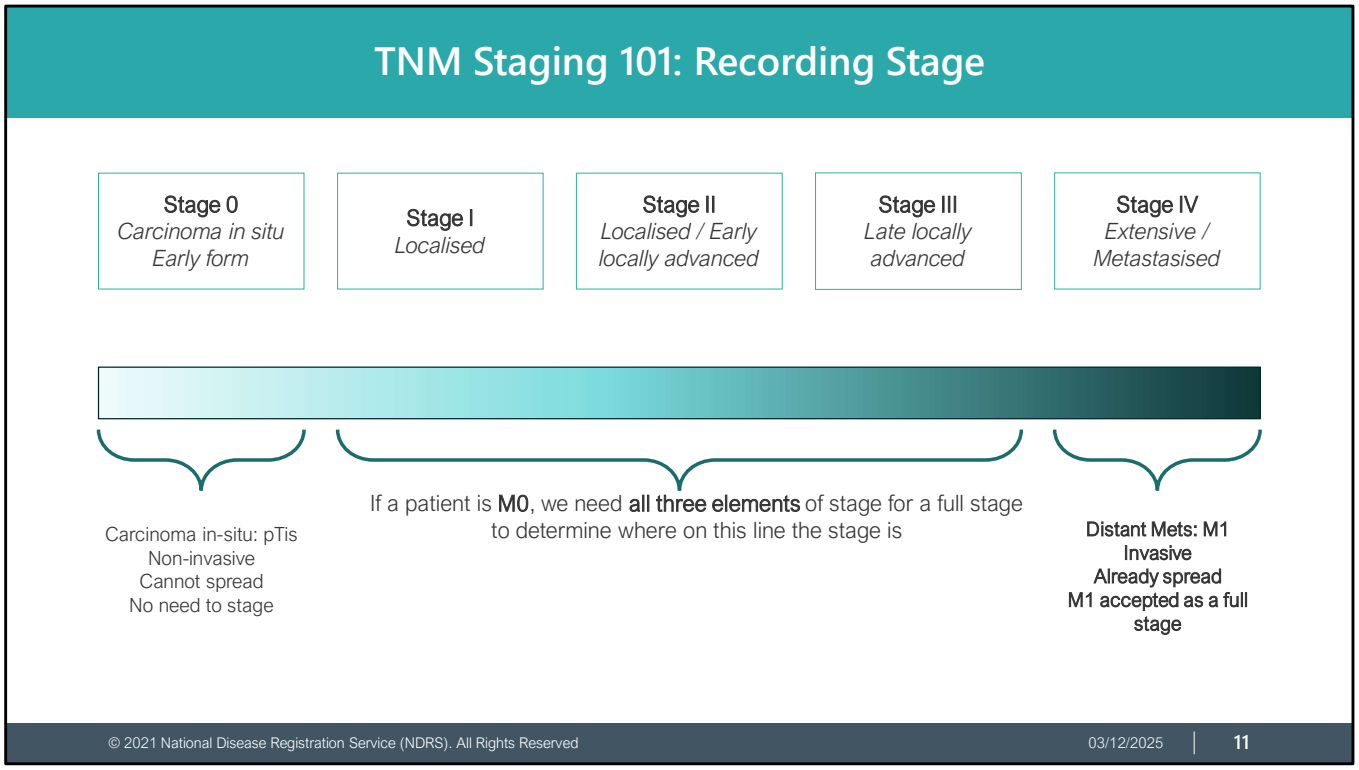
Stage 0	Stage I	Stage II	Stage III	Stage IV
Carcinoma in situ Early form	*Localised*	*Localised / Early locally advanced*	*Late locally advanced*	*Extensive / Metastasised*

Carcinoma in-situ: pTis
Non-invasive
Cannot spread
No need to stage

Imagine this shaded line represents tumour stage. At one end we have a Tis – a tumour in situ. Because this tumour cannot access a transport system in the shape of blood- or lymph-vessels, it can't spread to other parts of the body. This in-situ tumour is D coded in ICD10 and, because it cannot, by definition, spread, it **doesn't** need to be staged.

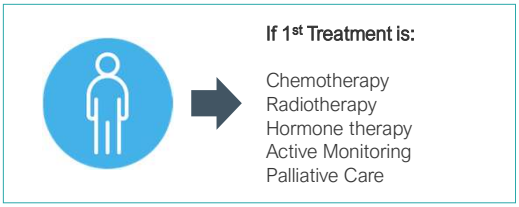


At the *other* end of the scale is a patient with distant metastatic deposits. This patient has an invasive tumour that **does** have access to blood- and lymph-vessels and as such is C coded in ICD10 … in this case the tumour has already spread to form one or more secondary tumours. If you **know** a patient has an M stage of M1, but for some reason you're *unable* to provide a T stage or an N stage, recording the patient's M1 stage tells us what we need to know: *where* the patient's cancer sits on this staging line. An **M1** stage is counted as a *full* stage.



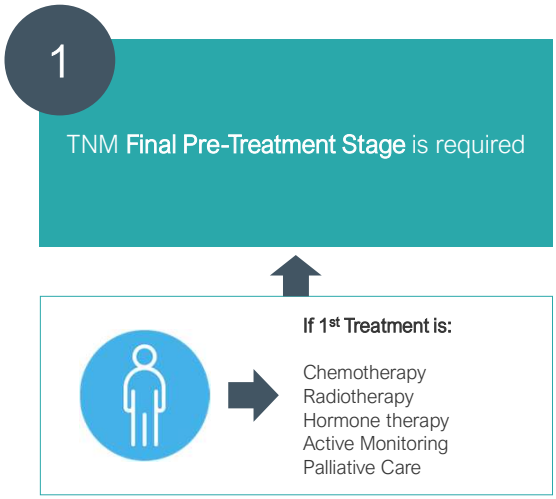
… but if the patient's invasive tumour is deemed not to have mets and is therefore M0, we must have all three elements of the stage, T, N *and* M in order to determine where the cancer stage sits on this line

TNM Staging 101: Which Stage should be collected?

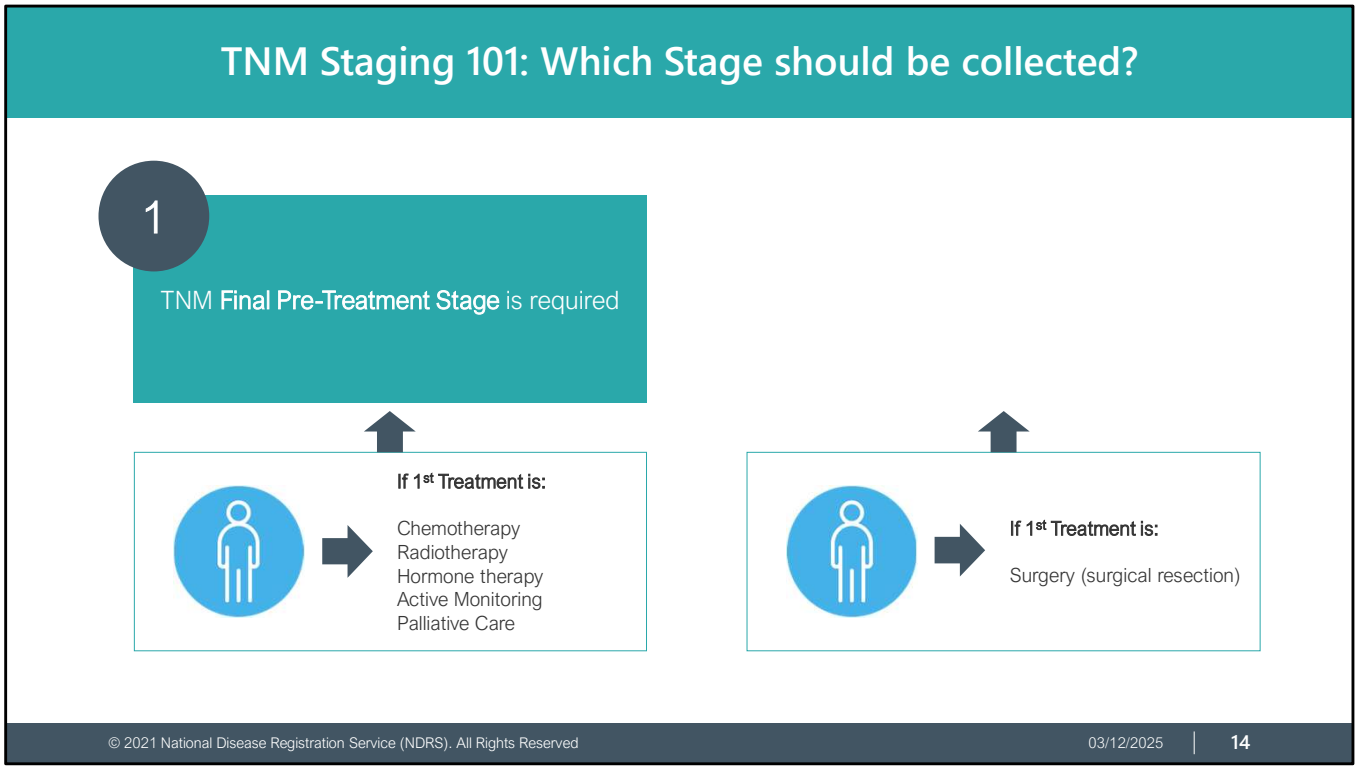


So, which stage should you be collecting? That depends on the first treatment. The aim of Chemotherapy, radiotherapy or hormones is usually to control or reduce the size of the tumour, so the tumour might stay the same or it might shrink. But if the patient's first treatment is either monitoring or palliative care, the tumour might stay the same or it might grow larger.

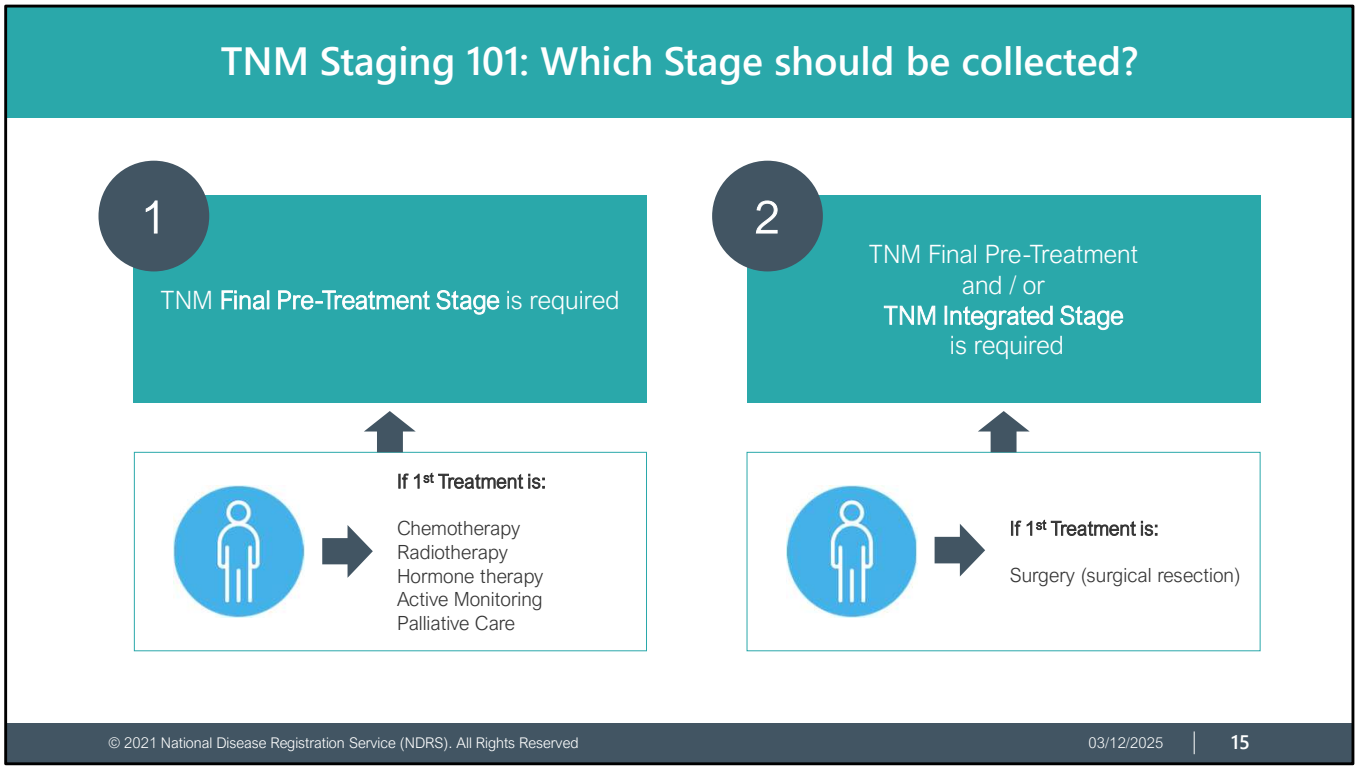
TNM Staging 101: Which Stage should be collected?



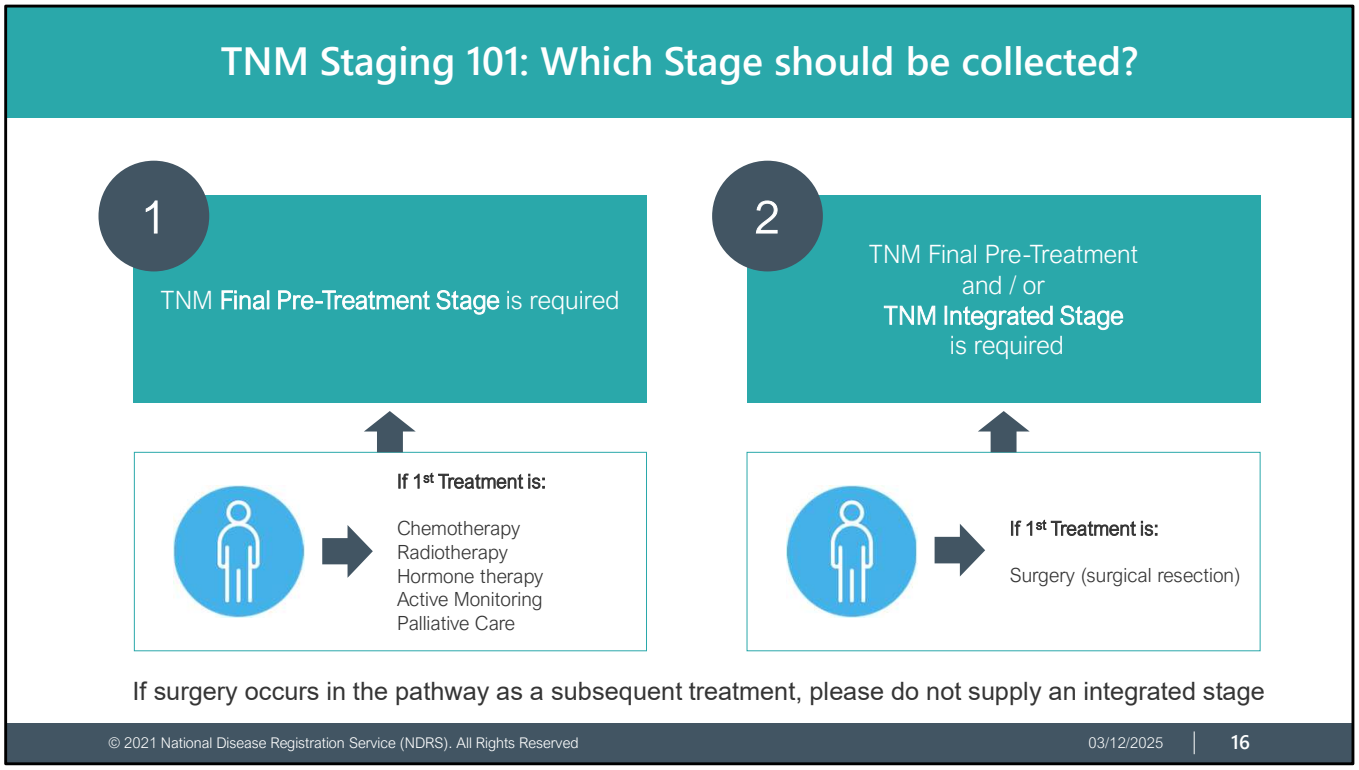
Because for COSD we are always looking for stage at the point of diagnosis … where a patient has a first treatment like this … a systemic or targeted treatment that may affect the size of the tumour … this means we would always want the Final Pre-Treatment stage …. and only the Final Pre-Treatment stage. This Final Pre-treatment stage may also be collected where the first treatment has not yet been determined or prior to Surgery.



If a patient goes straight to surgery without any prior treatment, the surgical excision of the tumour – while it treats the patient - doesn't actually do anything to the tumour itself other than remove it. At this point it's passed to a pathologist who will examine the tumour under a microscope. These are the circumstances under which…



… we would expect an Integrated stage. It may be that the patient record already contains a final pre-treatment stage – and we are happy to take either a pre-treatment stage or an integrated stage… or even both … for a patient who's gone straight to surgery.

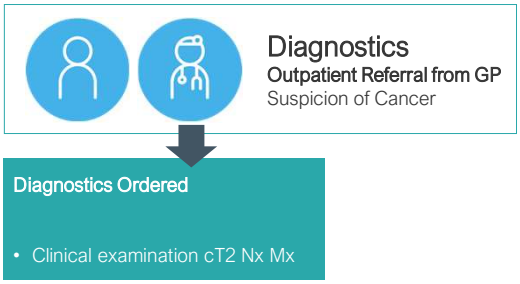


… but if surgery occurs as a *subsequent* treatment, please do NOT supply an integrated stage because the tumour size may have changed since the point of diagnosis.

TNM Staging 101: Colorectal Sample Pathway

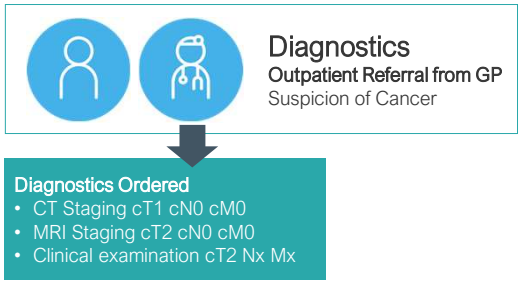
Now we're going to look at a sample pathway. In this example, a colorectal patient is referred from the GP with a suspicion of cancer…

TNM Staging 101: Colorectal Sample Pathway



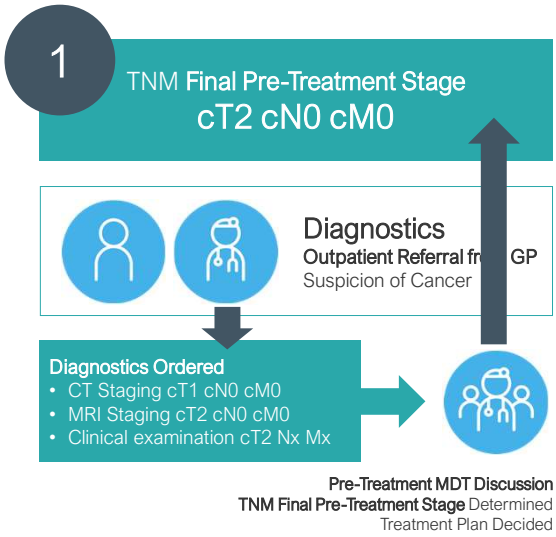
… the patient undergoes a number of investigations which can contribute to the staging information… for instance a colonoscopy will only enable assessment of the primary colon tumour. The camera cannot see through the bowel wall to … assess local lymph nodes for instance or to see possible metastases… so in this contributory stage it's perfectly valid to have a stage of T2NxMx (where the x indicates "cannot be assessed")…

TNM Staging 101: Colorectal Sample Pathway



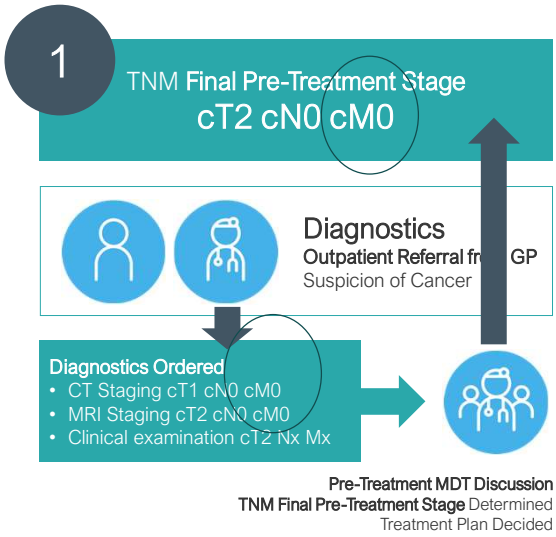
… whereas the CT and MRI are able to show any enlarged lymph nodes or lesions which are suspicious of mets. With these various contributory assessments of stage…

TNM Staging 101: Colorectal Sample Pathway

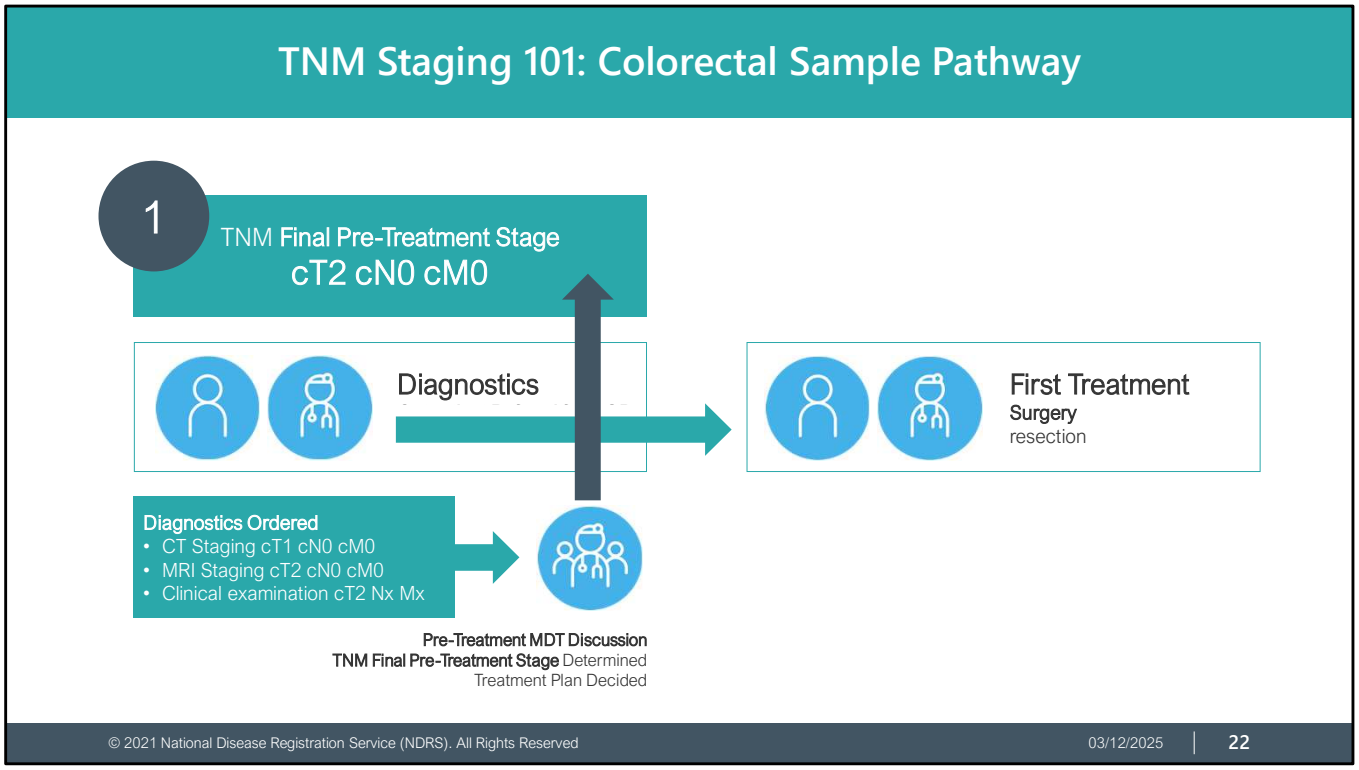


… the patient can be discussed at a pre-treatment MDT where the clinical team will review their case and can then reach a consensus on the Final Pre-Treatment Stage.

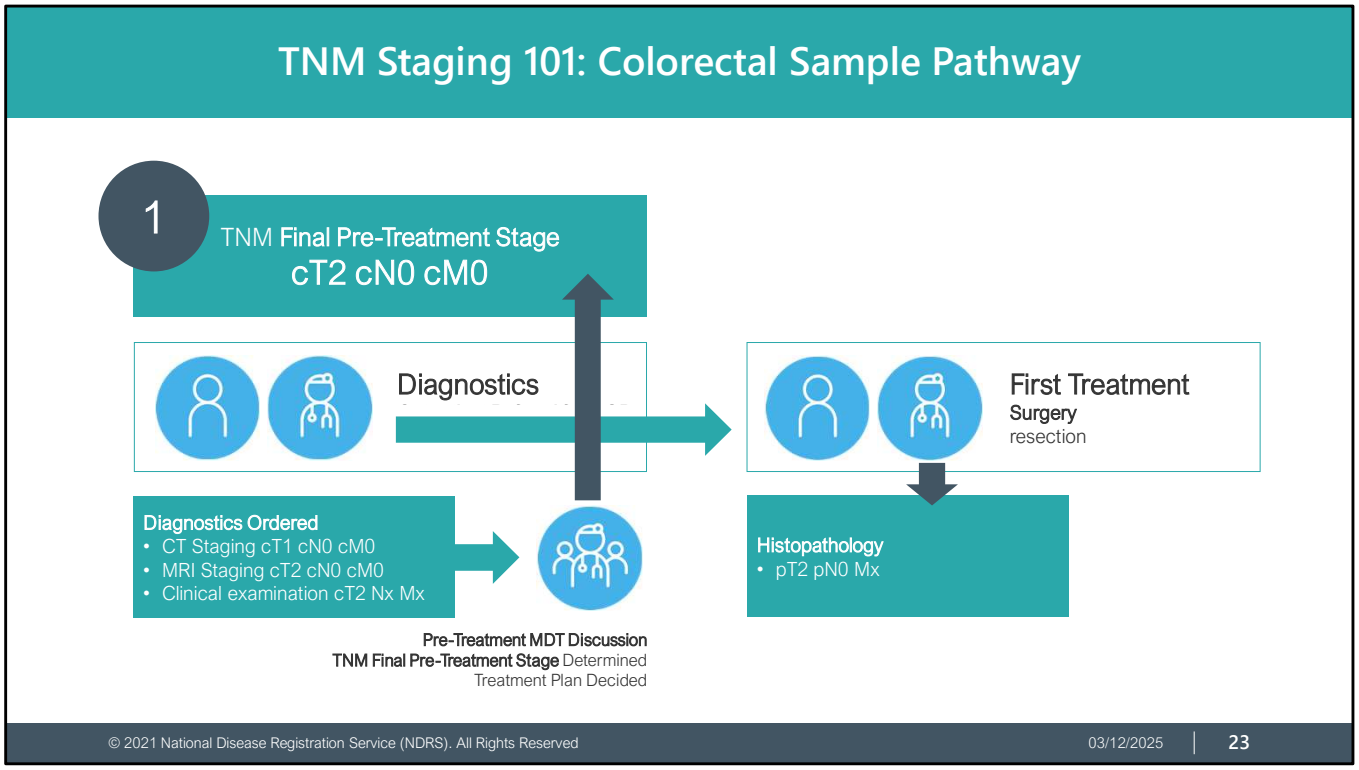
TNM Staging 101: Colorectal Sample Pathway



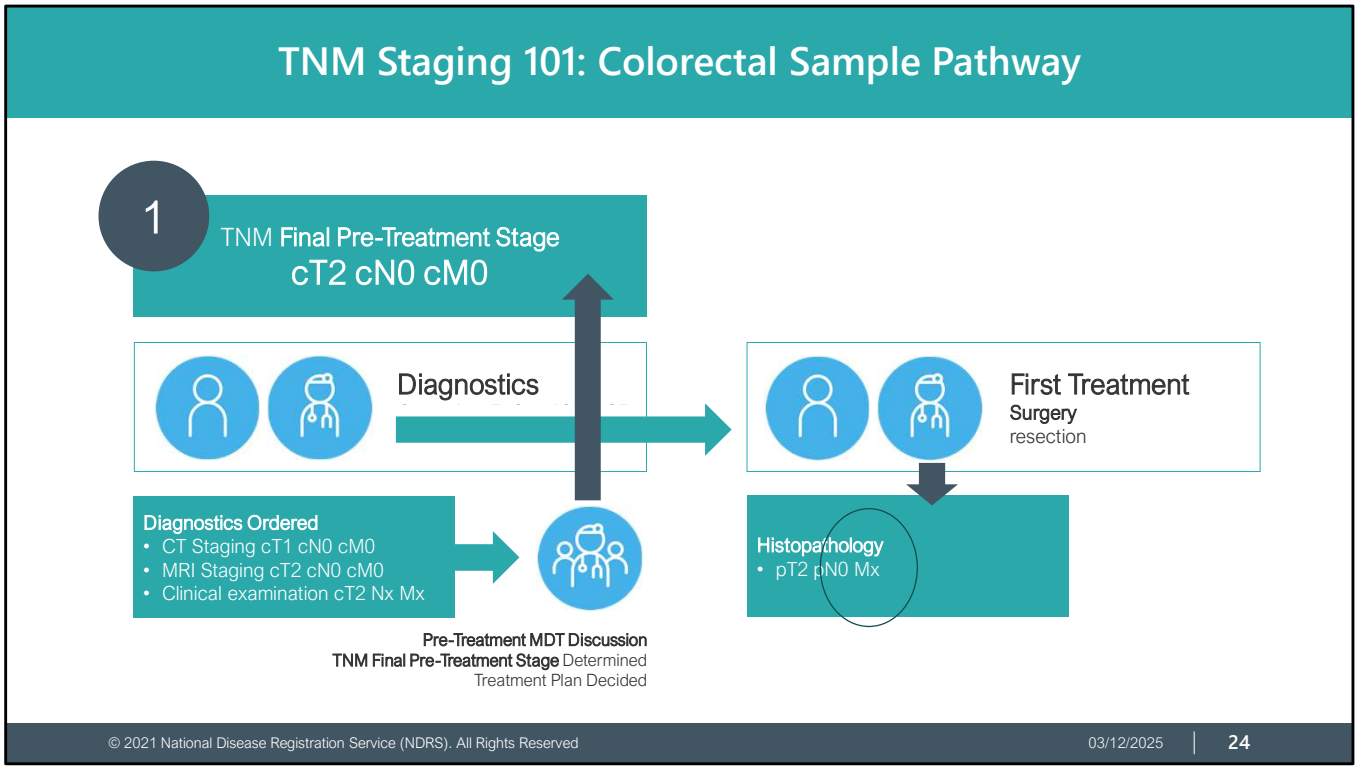
In this instance the M0 has been arrived at through imaging. However, if clinical suspicion of metastases is sufficiently low that no imaging takes place, it's expected that the clinical team would direct that M0 is recorded. All three elements, T, N & M, would normally be needed for a full stage: leaving the M stage blank would result in only a partial stage. Mx is NOT an allowable M stage for a final pretreatment stage



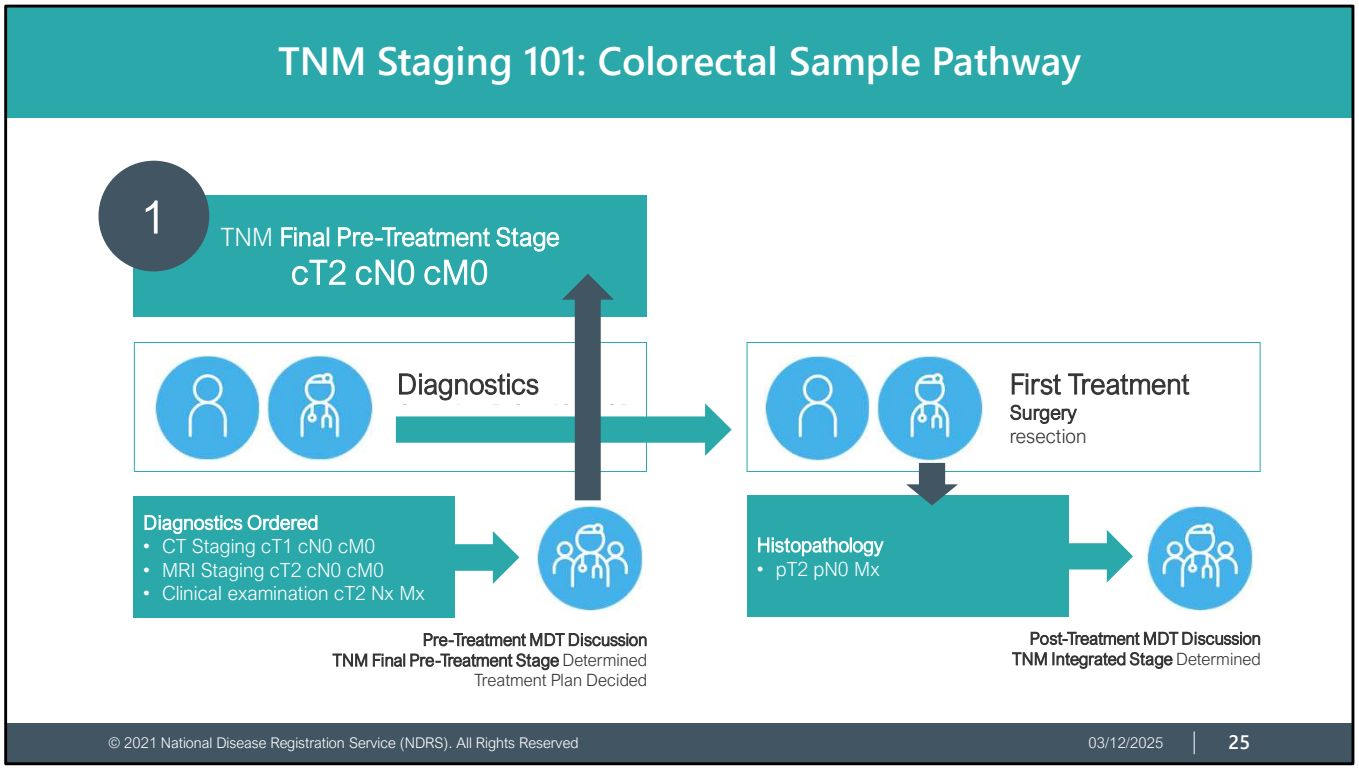
In this example, the patient has gone straight to surgery…



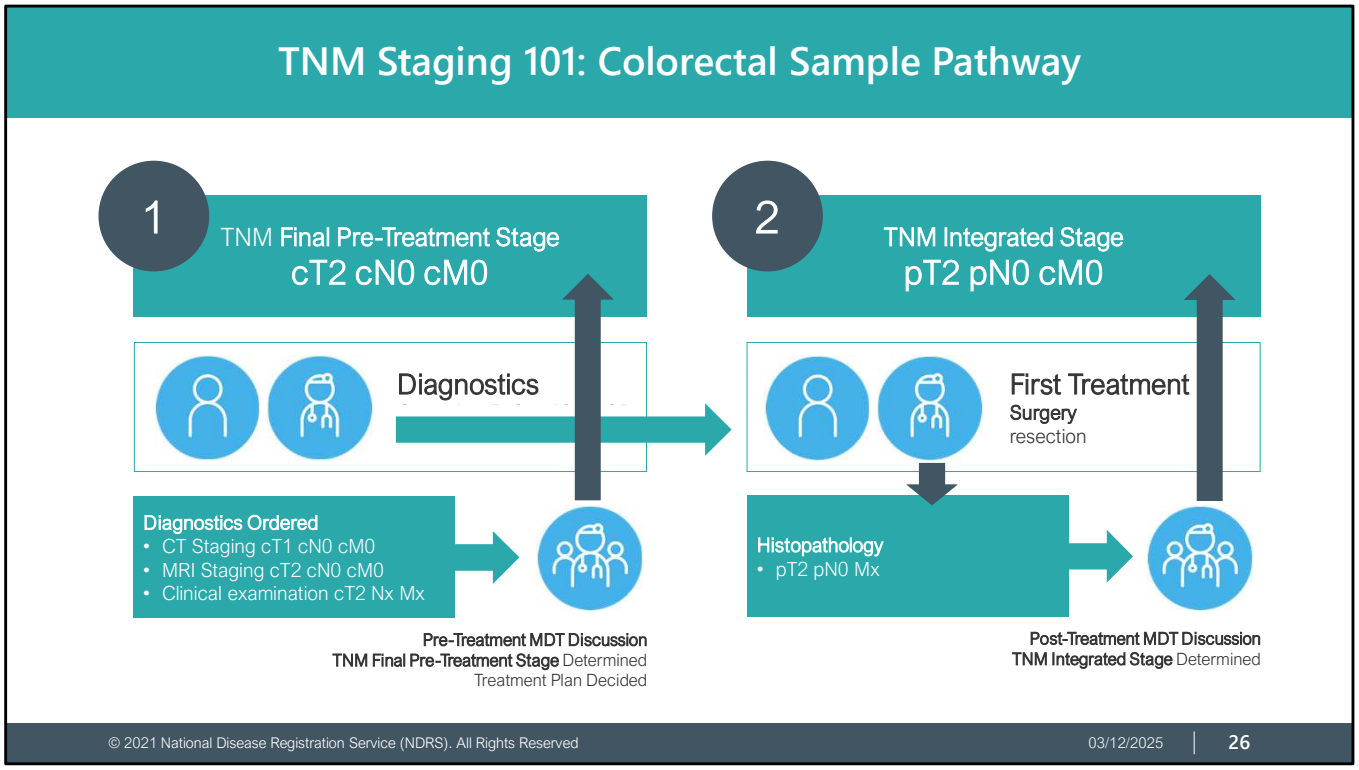
… during which the primary tumour has been excised along with a sampling of lymph nodes. The pathologist is able to make an assessment of the tissue samples they have in front of them…



… but they are unable to assess metastases because they don't have the entire patient under the microscope… so in this contributory pathological stage, Mx (or no mention of the M stage at all) is valid.



At a post-treatment MDT, the clinical team meet again to discuss the patient's pathway, including stage…



Using the assessment from the pathological excision, along with any previous clinical information and any Final Pre-Treatment stage, a consensus is reached on the patient's Integrated Stage. As with the Final Pre-Treatment Stage, all three elements are normally needed for a full stage and, as with the pre-treatment stage, Mx is not an appropriate category and cannot be entered – M stage should be M0 or M1 as determined by the clinical team.

TNM Staging 101: Staging Symbols

cT cN cM	Clinical TNM

You may see staging in written form with one or more prefixes or possibly a suffix. A C prefix means the stage was arrived at by clinical means. For the purposes of staging, Clinical means “any process that doesn’t involve a microscope” so clinical staging would include staging by means of radiological imaging.

TNM Staging 101: Staging Symbols

cT cN cM	Clinical TNM
pT pN pM	Pathological TNM

A P prefix indicates that the stage was arrived at by examining cells under a microscope. This would usually be histological after the excision of the whole tumour but may be cytological – for instance the presence of metastatic cells in abdominal ascites would be determined using cytology

TNM Staging 101: Staging Symbols

cT cN cM	Clinical TNM
pT pN pM	Pathological TNM
ycT ycN ycM	Clinical TNM after neo adjuvant treatment
ypT ypN ypM	Pathological TNM after neo adjuvant treatment

A YC or YP prefix indicates that this stage was arrived at after neoadjuvant treatment. Whilst this type of stage is often very useful for the clinical team, please do NOT record a post-neo-adjuvant stage in the staging fields of your cancer data management system

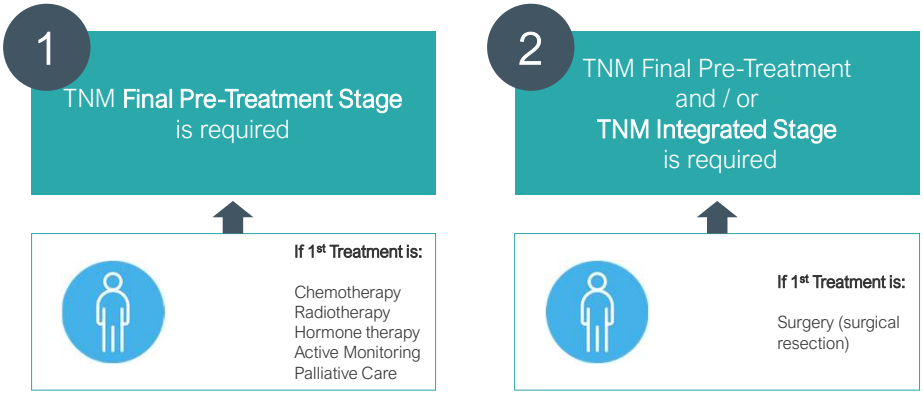
TNM Staging 101: Staging Symbols

cT cN cM	Clinical TNM
pT pN pM	Pathological TNM
ycT ycN ycM	Clinical TNM after neo adjuvant treatment
ypT ypN ypM	Pathological TNM after neo adjuvant treatment
Tis	Carcinoma in situ
pTa	Non-invasive papillary carcinoma in situ (Bladder)

Other staging symbols you may see might include Tis which indicates that the tumour is in-situ and would only be applied to certain D coded tumours. You may also see pTa which is applied to a specific type of non-invasive bladder tumour.

TNM Staging 101: Stage Completeness

A TNM-stageable cancer is considered fully staged when at least one of the following have been submitted in the COSD submission:



In order to be considered fully staged, pathways with a non-surgical first treatment must have a full final pre-treatment stage. Pathways where the first treatment was surgery may have a full final pre-treatment stage or a full integrated stage (or both).

TNM Staging 101: Staging Versions

Some neuroendocrine tumours may need to be staged in and have their stage recorded as the ENETS version of TNM staging. Please check the specific training modules to determine if a neuroendocrine tumour requires an ENETS stage.

Other tumours that require a TNM stage should be staged in and have their stage version recorded as follows:

- For diagnosis dates up to 31st December 2025 use UICC TNM v8
- For diagnosis dates from 1st January 2026 use UICC TNM v9

Please note that the TNM version must be accurately recorded – if you are unable to amend the version on your cancer data management system, please refer to your line manager. If, after the 1st January 2026, your cancer data management system cannot be amended in a timely manner (this may apply to some systems with an annual update) clinical teams must supply administrators with the correct TNM version and the following comment will need to be added to the Primary Diagnosis Subsidiary Comment field:

Patient staged using TNM9 not TNM8 as per CR2070

The staging **version** also needs to be correctly reported for COSD. Some **neuroendocrine** tumours will need to be staged in and recorded as the ENETS version. Other TNM stageable tumours should be staged in and recorded as the appropriate **standard** TNM version as shown depending on the diagnosis date.

TNM Staging 101: Things to Remember!

1. Make sure **the date** and the **organisation code** is reported with the stage
2. Share the TNM 101 staging slides with your colleagues
3. Training modules are available here: https://digital.nhs.uk/ndrs/data/cancer-data-training-materials
4. Contact your Data Liaison Manager - we are there to support you

Please remember that the staging date and organisation code need to be recorded as well as the stage. We encourage you not only to share the TNM staging slides with your colleagues but also the site-specific training modules available on the NDRS website.

The Data Liaison Team

East Midlands: **Simon Cairnes** – simon.cairnes@nhs.net

Eastern: **Marianne Mollett** – marianne.mollett@nhs.net

London & South-East: **Katrina Sung** – katrina.sung@nhs.net

London & South-East: **Karen Graham**– karen.graham36@nhs.net

North-West: **Paul Stacey** – p.stacey@nhs.net

Northern & Yorkshire: **Rachael Mann** – rachaelmann@nhs.net

Oxford: **Gemma Feeney** – gemma.feeney@nhs.net

South-West: **James Withers** – james.withers@nhs.net

West Midlands: **Gemma Feeney** – gemma.feeney@nhs.net

And of course, we're here to support you. If you have any questions about TNM staging or any other aspect of COSD data, do please get in touch with your regional data liaison manager