Welcome to this NDRS training module on tumours of the Renal Pelvis, Ureter, Bladder and Urethra which has been designed to help Cancer Administration staff gain a better understanding of these tumours and the terminology used by the clinical teams.

Agenda

- Introduction
- Urinary Tract – Renal Pelvis, Ureter, Bladder & Urethra
- Summary
- Acknowledgements

This module may be paused at any time

We're going to give you a brief introduction to Urological tumours including some of the symptoms that patients might experience. We'll look at the anatomy & physiology of the Urological system and will then go through diagnosis & treatment options. This module can be paused at any time.

Introduction

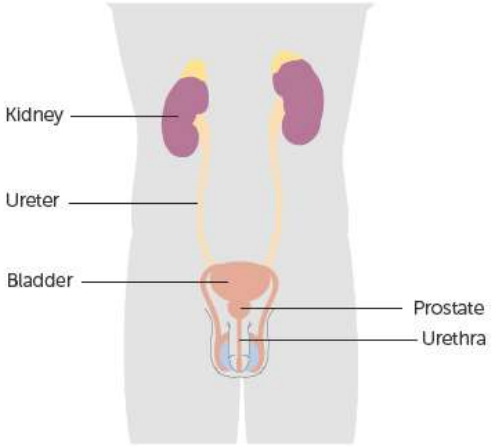
In this section we will cover:

- Types of Urological tumour

Firstly, we'll look at the various types of Urological tumour…

Urology

- There are two main types of Urological tumours:
  - Prostate tumours
  - Urinary Tract tumours. These tumours are subdivided into:
    - Kidney tumours (excludes Renal Pelvis)
    - Tumours of the Renal Pelvis, Ureter, Bladder & Urethra



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… which are divided into tumours of the Prostate and tumours of the Urinary Tract. Urinary tract tumours are further classified as either Kidney or Renal Pelvis, Ureter, Bladder & Urethra. This module covers tumours of the Renal Pelvis, Ureter, Bladder and urethra.

Urinary Tract – Renal Pelvis, Ureter, Bladder & Urethra

In this section we will cover:

- Causes and Risk Factors
- Signs and Symptoms
- Anatomy & Physiology
- Regional Lymph Nodes
- Diagnosis
- Morphology & Topography
- Grade
- Stage
- Treatment

We'll start off by looking at the causes and risk factors …

Urinary Tract – Causes & Risk Factors

- The most common preventable risk factor for bladder cancer is smoking

- Other causes and risks associated with urinary tract tumours include:
  - Aryl-amines (chemicals found in certain foods, dyes and other substances)
  - Ethnic background
  - Early menopause or bilateral oophorectomy (removal of the ovaries)
  - Bladder stones
  - Type 2 diabetes
  - Renal papillary necrosis (where certain areas of the kidney die)
  - Previous cancer treatment
  - Family history

The main preventable risk factor for a bladder tumour is smoking. Other risks for urinary tract tumours include early menopause, bladder stones, type 2 diabetes or previous cancer treatments

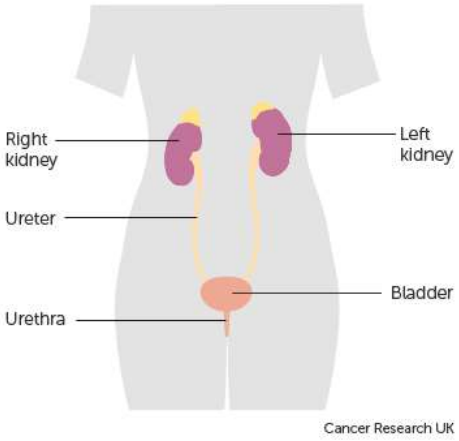
Urinary Tract – Signs & Symptoms

- The most common symptom of urinary tract cancer is haematuria with around 80% of patients presenting with evidence of blood in the urine .
    - Haematuria (blood in the urine – macroscopic haematuria can be seen with the naked eye, microscopic haematuria can only be seen under a microscope)
    - Dysuria (painful or difficult urination)
    - Obstruction

Urinary tract tumours may present with blood in the urine, difficulty urinating or an obstruction in the urinary system

Urinary Tract – Anatomy & Physiology

- The renal pelvis is the enlarged, funnel shaped upper end of the ureter that is almost completely enclosed within the kidney
- The ureter connects the renal pelvis to the bladder, the organ which acts as a collection point for urine. The bladder sits behind the pubic bone at the bottom of the pelvic cavity
- The urethra is a muscular tube extending from the bladder to the exterior, which transports urine from the bladder to the exterior of the body

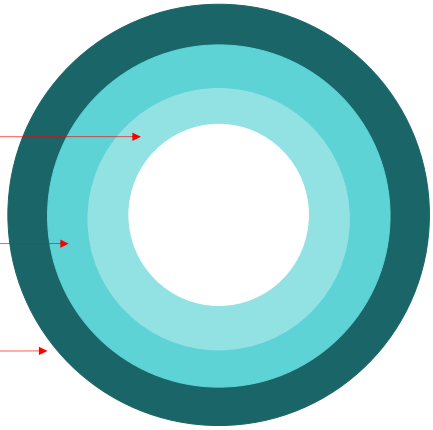


The renal pelvis is the top part of the ureter and is almost completely enclosed within the kidney. Urine is collected within the renal pelvis and then travels down the ureter to the bladder. Urine is then released via the urethra.

Urinary Tract – Anatomy & Physiology

The walls of the urinary tract consist of three main layers of tissues. From the inside, these are:

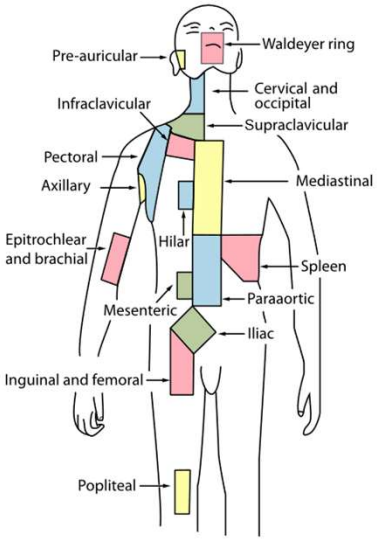
- Transitional epithelium or urothelium
- Submucosa (including the lamina propria)
- Muscularis propria



The urothelium (also known as the transitional epithelium) makes up the innermost layer of the urinary tract. Next to this is the submucosa and on the outside is a layer of muscular tissue.

Renal Pelvis & Ureter – Regional Lymph Nodes

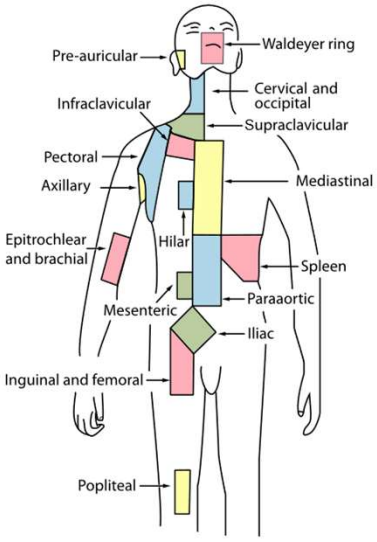
- Renal hilar lymph nodes
- Abdominal para-aortic lymph nodes
- Paracaval lymph nodes (next to the vena cava blood vessel)
- Intrahepatic lymph nodes (in the liver)



During an MDT, clinical teams will often make reference to particular groups of regional lymph nodes. This may indicate that the stage of the cancer has been determined. The regional lymph nodes for tumours of the renal pelvis or ureter are listed here…

Bladder – Regional Lymph Nodes

- Hypogastric lymph nodes (near internal iliac nodes)
- Obturator lymph nodes (near external iliac nodes)
- External iliac lymph nodes
- Presacral lymph nodes (near the base of the spine)
- Lymph nodes along the common iliac artery



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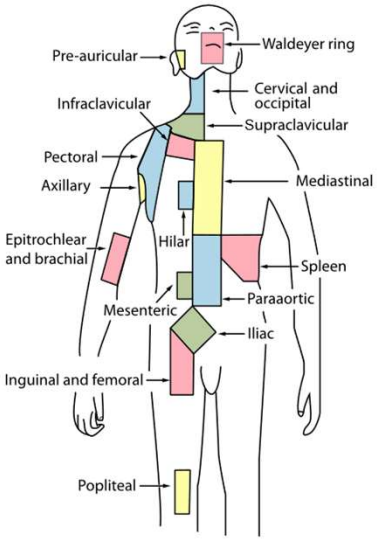
Urethra – Regional Lymph Nodes

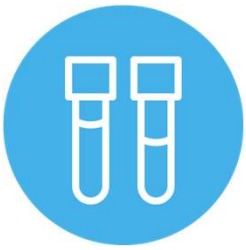
- Inguinal lymph nodes
- Pelvic nodes lymph nodes



… and finally for the urethra, here.

Urinary Tract – Diagnosis

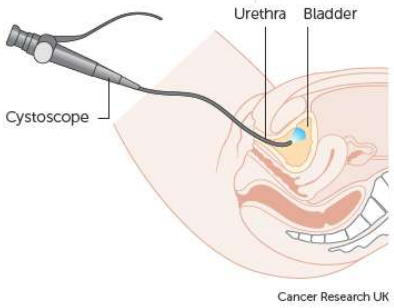
- Patients that have a suspected urinary tract cancer may have a urine test to identify blood or malignant cells
- An ultrasound scan can examine the urinary tract to identify any blockages
- An intravenous urogram (IVU) (also known as an intravenous pyelogram or IVP) is a radiological procedure with a contrast medium introduced through a vein. The contrast medium highlights any blockages or abnormal structures on x-ray imaging such as filling defects in the bladder



Where blood is found in the urine, imaging will be carried out to rule out involvement of other parts of the urinary system. An ultrasound or Intravenous Pyelogram might be used to assess the functionality of the kidneys, ureters and bladder.

Urinary Tract – Diagnosis

- CT urogram (CTU) also uses a contrast medium but with CT imaging to identify the source of blood in urine
- Cystoscopy is an endoscopic procedure that examines the inside the urinary tract via the urethra. It is also possible to biopsy abnormal areas during the procedure
- A biopsy is the only way to confirm the specific type of tumour, this is important because different types and behaviours of tumours will require different treatment



Other diagnostic test options include a CT Urogram, cystoscopy or biopsy.

Urinary Tract – Diagnosis

- Once a urinary tract cancer has been diagnosed, further investigations will be needed to assess the extent of any spread from the primary cancer.

  - •Glomerular filtration rate test (an assessment of how well the kidneys make urine)
  - •Bone scan
  - •PET scan
  - •CT scan or MRI scan

Photograph of a bone scanner
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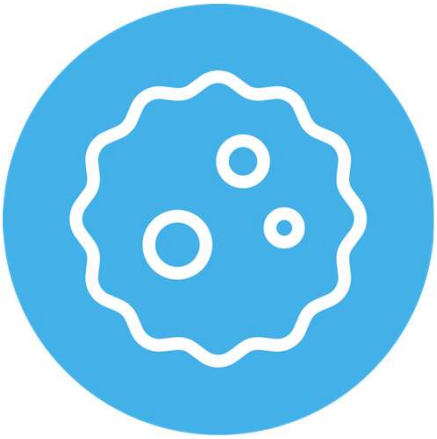
In the event of a tumour being diagnosed, further testing will be needed to assess any spread. This may include a bone scan or other imaging

Urinary Tract – Morphology

Morphology code or description would normally be found on the pathology report



Invasive Tumours

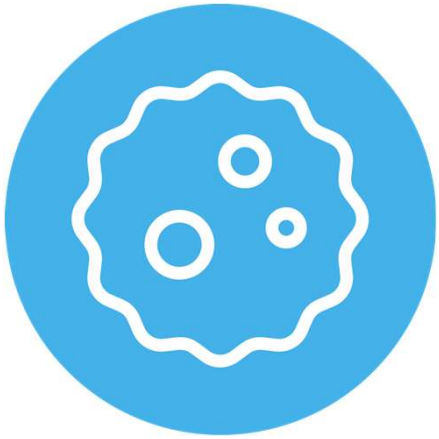
- Urothelial carcinoma (also known as transitional cell carcinoma or TCC) is the most common type of urinary tract tumour arising from the transitional cells of the lining of the urinary tract
  - TCCs are normally defined as M8120/3
  - The (very rare) spindle cell variant is M8122/3

The most common type of tumour is a urothelial carcinoma, which would occur in the innermost layer of the urinary tract.

Urinary Tract – Morphology

Other types of invasive bladder cancer:

- Squamous cell carcinoma (SCC) – M8070/3
- Adenocarcinoma that arises in the mucus producing cells of the bladder lining and accounts for about 2% of all bladder cancers – M8140/3
- Sarcoma that arise in the muscle tissues of the bladder rather than the bladder lining – M8800/3



Bladder tumours may also occur as Squamous cell carcinoma, Adenocarcinoma or sarcoma.

Urinary Tract – ICD10 Topography, invasive

Renal Pelvis – C65X
Ureter – C66X
Bladder:
- Trigone – C67.0
- Dome – C67.1
- Lateral wall – C67.2
- Anterior wall – C67.3
- Posterior wall – C67.4
- Bladder neck – C67.5
- Ureteric orifice – C67.6
- Urachus – C67.7
- Overlapping bladder – C67.8
- Bladder unspecified – C67.9

Urethra – C68.0
Paraurethral gland – C68.1
Overlapping urinary organs – C68.8
Urinary organs unspecified – C68.9

All invasive ICD10 codes must be recorded in your cancer data management system.

Urinary Tract – Morphology & ICD10 Topography, non-invasive

Some urothelial tumours are classified as **non-invasive carcinoma**. These include superficial tumours which are limited to the lining of the bladder that frequently recur but rarely metastasise. These must be recorded in your cancer data management system

These would be coded as:

Non-invasive papillary transitional cell carcinoma of the bladder

- pTa (all grades): ICD10 coded to **D09.0**, morphology **M8130/2**

Carcinoma In-situ (flat) of the bladder

- pTis: ICD10 coded to **D09.0**, morphology **M8120/2**

Some non-invasive tumours of the urinary tract also need to be recorded. These include pTa bladder tumours and in-situ carcinomas of the bladder…

Urinary Tract – Morphology & ICD10 Topography, non-invasive

Non-invasive carcinomas may also occur in the renal pelvis, ureter and urethra. The ICD10 codes listed here also need to be recorded in your cancer data management system

- Neoplasm of uncertain or unknown behaviour of renal pelvis – D41.1
- Neoplasm of uncertain or unknown behaviour of ureter – D41.2
- Neoplasm of uncertain or unknown behaviour of urethra– D41.3

If supplied in the pathology report, the morphology code for these tumours may show a behaviour code of /1 or the description would indicate "uncertain or unknown behaviour". For more details on morphology coding please see the NDRS training module: What is cancer?

… as well as these tumours of uncertain or unknown behaviour of other urinary organs.

Urinary Tract – Morphology & ICD10 Topography, non-invasive

In-situ tumours may also occur in the renal pelvis, ureter and urethra:

- Carcinoma in-situ of other and unspecified urinary organs – D09.1

If supplied in the pathology report, the morphology code for these tumours may show a behaviour code of /2 or the description would indicate "in-situ". For more details on morphology coding please see the NDRS training module: What is cancer?

However, D09.1 does not require a record from your cancer management system for the purposes of COSD. NDRS obtains data on these tumours direct from the pathology laboratories

Any in-situ carcinomas of renal pelvis, ureter or urethra are all coded to D09.1 in ICD10. Please be aware that a COSD record is not required for D09.1, NDRS obtains data on these tumours direct from the pathology labs.

Urinary Tract – Grade

Invasive

Invasive cancers are graded by the standard numerical system

Grade 1 – Well differentiated
Grade 2 – Moderately differentiated
Grade 3 – Poorly differentiated

Non-Invasive

- PUNLMP (Papillary urothelial neoplasm of low malignant potential)
- Grade 1 – Well differentiated
- Grade 2 – Moderately differentiated
- Grade 3 – Poorly differentiated
- Low grade
- High grade

Invasive urological tumours are graded on the degree of differentiation. A Grade 1 – or Well Differentiated – cell will more closely resemble normal cells and may still be able to perform some of the functions of a normal cell. A Grade 3 cell will look very different to a normal cell and have much less functionality. Non-invasive tumours may be graded using different systems such as High or Low grade depending on the tumour

Urinary Tract – Stage

- Invasive tumours are staged 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 1st January 2026, your cancer data management system has not been amended to include TNM v9 please record the TNM v9 stage and add the following statement to the Primary Diagnosis Subsidiary Comment field:
  - Patient staged using TNM9 not TNM8 as per CR2070

Invasive tumours are staged using the appropriate UICC TNM version

Urinary Tract – Stage

- For details on recording stage, please see the NDRS training module KPI-TNM Staging 101, available on this link (account required): https://digital.nhs.uk/ndrs/data/cancer-data-training-materials

- TNM stage should be recorded for all invasive tumours

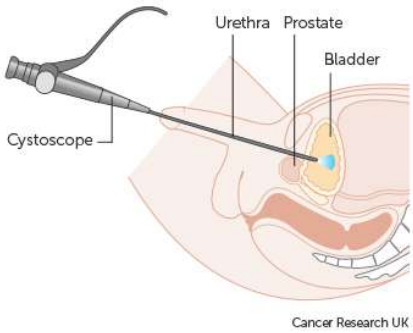
For details on recording Stage please refer to the NDRS training module KPI-TNM Staging 101

Urinary Tract – Treatment – Surgery

Surgery is the most common treatment for all urinary tract tumours, although the type and extent of the surgery will depend on factors such as the location, behaviour, stage and grade of the cancer

Early bladder tumours are usually treated with TURBT (Trans Urethral Resection of Bladder Tumour)

- A TURBT is normally carried out using a cystoscope
- Surgical instruments are passed down the cystoscope to remove the tumour



For early stage urinary tract tumours, surgery is often the first treatment. In the case of an early stage bladder tumour, the surgery may take the form of a TURBT, or Trans Urethral Resection of Bladder Tumour, which is carried out via a cystoscope

Urinary Tract – Treatment – Surgery

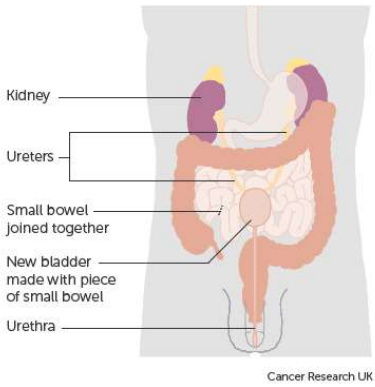
For more advanced or aggressive cancers, removal of part or all of the urinary tract is likely to be performed

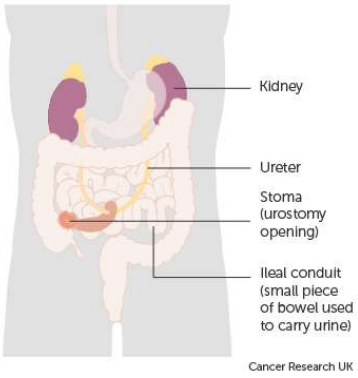
- Partial cystectomy
- Radical cystectomy (removal of the entire bladder)
- Nephro-ureterectomy (removal of the kidney, the associated ureter and part of the bladder)

Where a tumour is more advanced or aggressive, the partial or complete removal of the affected organ may be needed.

Urinary Tract – Treatment – Surgery

If the bladder has been removed, the patient will require either a reconstruction (often utilising part of either the small or large bowel) or an abdominal opening called a stoma, usually leading to an external urine bag





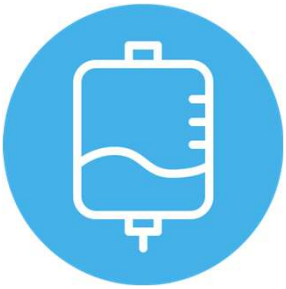
If the bladder has been completely removed, either an internal reconstruction or a stoma may be necessary.

Urinary Tract – Treatment – Chemotherapy

Chemotherapy can be administered in different ways depending on the behaviour, stage and location of the cancer

- Intravesical therapy is a type of treatment where drugs are put directly into the bladder via a catheter, reducing the risk of recurrence of early bladder cancers

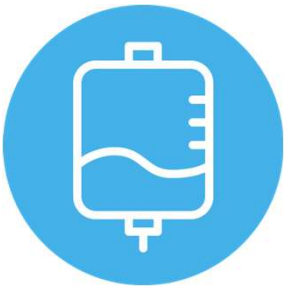
- BCG immunotherapy or chemotherapy are used. The drugs will affect the cells that line the bladder, with little or no effect on cells beyond the bladder lining, therefore intravesical therapy is used only for in-situ and early bladder cancers



Chemotherapy administration may vary depending on the type, stage and location of the tumour. For some early stage bladder tumours, it may be administered directly into the bladder. This method is called intravesical therapy and has little effect on cells beyond the bladder lining

Urinary Tract – Treatment – Chemotherapy

- Systemic chemotherapy is used for advanced cancers outside the bladder
- Chemotherapy and radiotherapy at the same time has been shown to work better than radiotherapy on its own for some people



Where intravesical therapies are not appropriate, systemic chemotherapy may be offered, sometimes in conjunction with radiotherapy

Urinary Tract – Treatment – Radiotherapy

Radiotherapy can be used with a curative intent and can have similar results to surgical treatments. However Radiotherapy is not a recommended treatment for patients where:

- The morphology is squamous cell bladder cancer
- The patient has carcinoma in-situ in much of the bladder as well as invasive carcinoma
- The disease did not respond well to initial chemotherapy
- The cancer is blocking both of the ureters

Radiotherapy can show similar results to surgery for some cancers, however it does not work well for SCCs, extensive in-situ tumours or where initial chemotherapy did not produce a good response. Nor would it be normally be offered where both ureters are blocked.

Summary

In summary …

Summary

- The main risk factor for bladder tumours is smoking. Other urinary tract tumour risk factors include exposure to certain chemicals, bladder stones, prior cancer treatment or type 2 diabetes

The primary – and preventable – risk factor for bladder tumours is smoking. Other risk factors for tumours of the urinary tract include bladder stones, prior cancer treatment and type 2 diabetes.

Summary

- The main risk factor for bladders tumours is smoking. Other urinary tract tumour risk factors include exposure to certain chemicals, bladder stones, prior cancer treatment or type 2 diabetes
- The symptoms of a urinary tract tumour may include blood in the urine, pain or difficulty on urinating or a urinary obstruction

Symptoms of a Urinary tract tumour might include blood in the urine or an obstruction

Summary

- The main risk factor for bladders tumours is smoking. Other urinary tract tumour risk factors include exposure to certain chemicals, bladder stones, prior cancer treatment or type 2 diabetes
- The symptoms of a urinary tract tumour may include blood in the urine, pain or difficulty on urinating or a urinary obstruction
- Investigations may include an ultrasound, CT Urogram, biopsy, bone scan or MRI

Investigations would normally include an ultrasound but may also include a CT Urogram, biopsy or other imaging

Summary

- The main risk factor for bladders tumours is smoking. Other urinary tract tumour risk factors include exposure to certain chemicals, bladder stones, prior cancer treatment or type 2 diabetes
- The symptoms of a urinary tract tumour may include blood in the urine, pain or difficulty on urinating or a urinary obstruction
- Investigations may include an ultrasound, CT Urogram, biopsy, bone scan or MRI
- If a tumour is diagnosed it may be invasive, in situ or of unknown or uncertain behaviour. While all invasive tumours and the non-invasive tumours specified in this module must be recorded, other non-invasive tumours do not need to be recorded on a cancer data management system for the purposes of COSD - NDRS obtains these records directly from pathology laboratories

If a tumour is diagnosed, it may or may not be invasive. All invasive tumours must be recorded in your cancer data management system as well as those non-invasive tumours listed for submission in this module

Summary

- Additional guidance on recording COSD data including morphology, topography, staging and recording a diagnosis can be found at: https://digital.nhs.uk/ndrs/data/cancer-data-training-materials
- Staging data sheets can also be downloaded from the NDRS website for clinical use: https://digital.nhs.uk/ndrs/data/cancer-data-training-materials/staging-sheets

Additional training modules as well as Staging sheets for clinical use may be downloaded from the NDRS website.

Summary

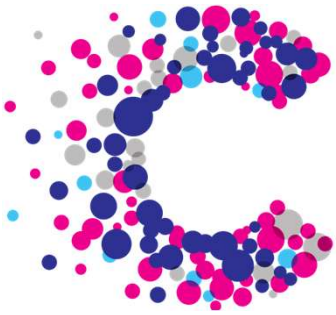
- If in any doubt as to whether you should be recording a diagnosis, please refer to the latest COSD User Guide, Appendices A, B & C
- For guidance on the required staging system, please refer to the latest COSD User Guide, Appendix E

- https://digital.nhs.uk/ndrs/data/data-sets/cosd#downloads

Do please remember, guidance **is** available on our website. You can download the COSD User Guide by clicking on this link and selecting the COSD version appropriate to your trust.

Acknowledgements

Many thanks to Cancer Research UK for the use of their images within this training module.



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We'd like to thank Cancer Research UK for the use of their images within this training module.

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If you have any questions on the information contained within this module or about COSD in general, do please feel free to email your regional Data Liaison Manager