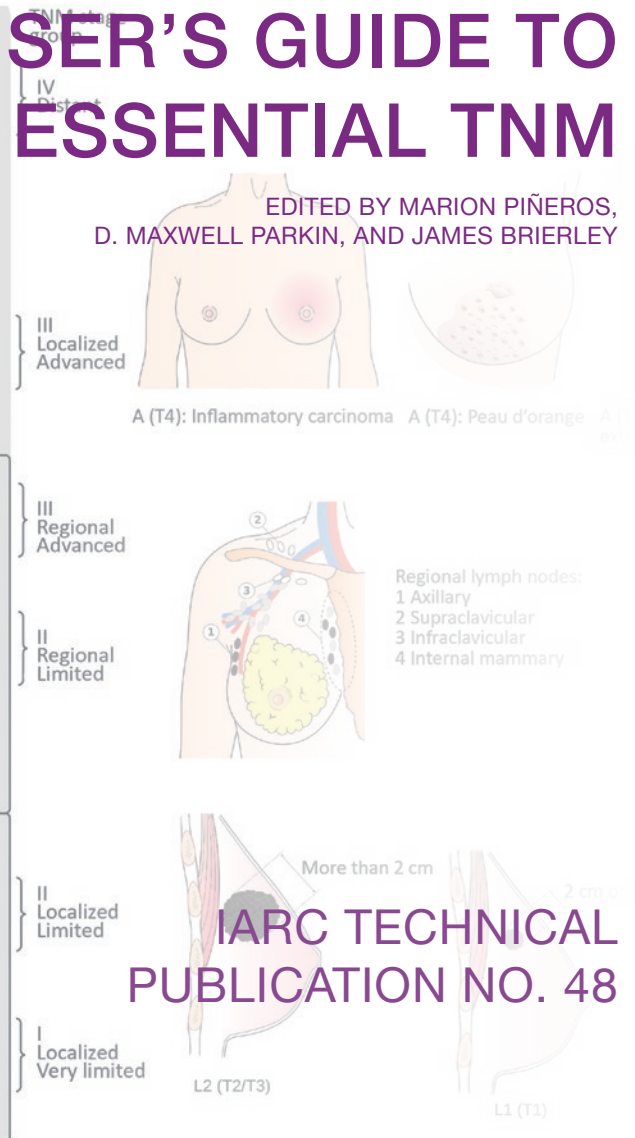
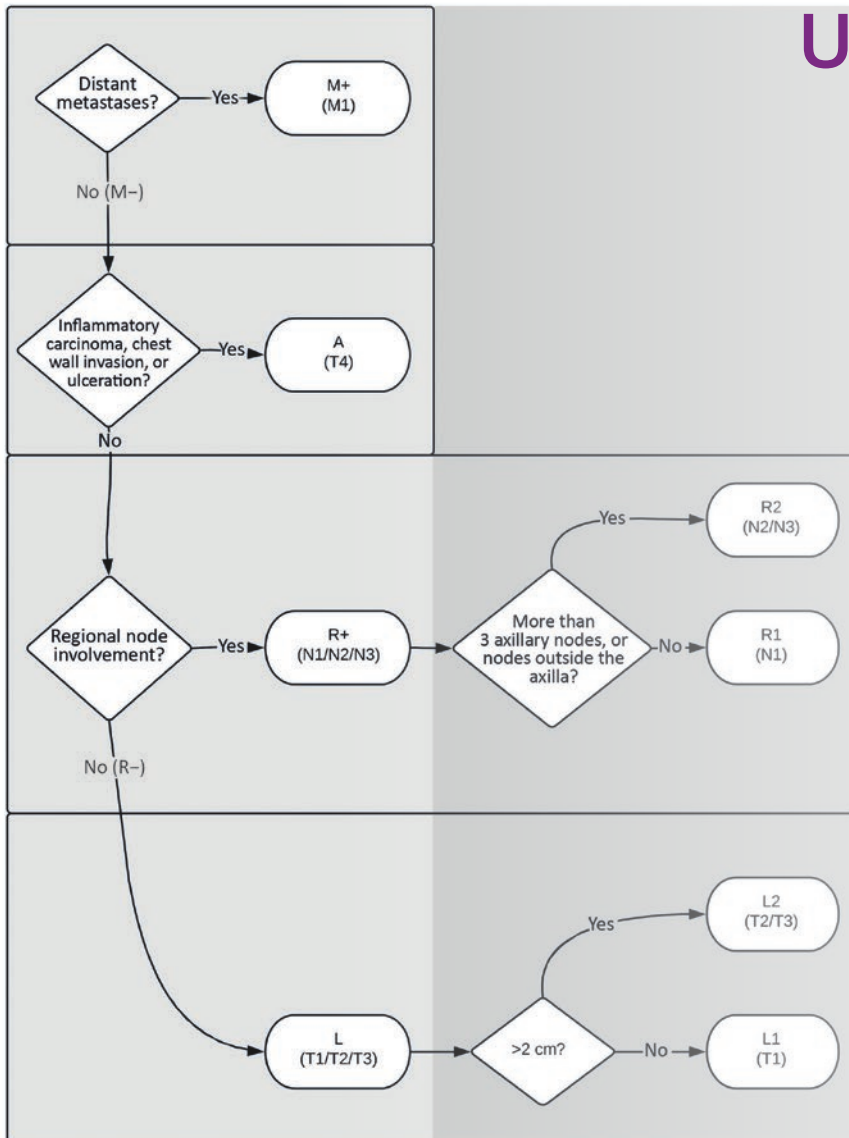


USER'S GUIDE TO ESSENTIAL TNM

EDITED BY MARION PIÑEROS, D. MAXWELL PARKIN, AND JAMES BRIERLEY



IARC TECHNICAL PUBLICATION NO. 48

International Agency for Research on Cancer



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POUR LE DEVELOPPEMENT
DES REGISTRES DU CANCER

INICIATIVA MUNDIAL
PARA EL DESARROLLO
DE REGISTROS DE CÁNCER



IACR

International Association of Cancer Registries

USER'S GUIDE TO ESSENTIAL TNM (E TNM)

VERSION 4.2
(FEBRUARY 2024)

EDITED BY MARION PIÑEROS,
D. MAXWELL PARKIN, AND JAMES BRIERLEY

IARC TECHNICAL PUBLICATION NO. 48

IARC, 2024

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Piñeros M, Parkin DM, Brierley J, editors (2024). User's Guide to Essential TNM (IARC Technical Publications No. 48). Lyon, France: International Agency for Research on Cancer. Available from: <https://publications.iarc.who.int/647>. Licence: CC BY-NC-ND 3.0 IGO.

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IARC Library Cataloguing-in-Publication Data

Names: Piñeros, Marion, editor. | Parkin, D. Maxwell, editor. | Brierley, James, editor.

Title: User's guide to essential TNM / edited by Marion Piñeros, D. Maxwell Parkin, James Brierley.

Description: Lyon: International Agency for Research on Cancer, 2024. | Series: IARC technical publications, ISSN 1012-7348; v. 48. | Includes bibliographical references.

Identifiers: ISBN 9789283224693 (pbk.) | ISBN 9789283224686 (ebook).

Subjects: MESH: Neoplasms - classification. | Neoplasm Staging.

Classification: NLM QZ 15

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Acknowledgements

Essential TNM was developed by a working group convened by the International Agency for Research on Cancer (IARC) and the Union for International Cancer Control (UICC) in Lyon, France, in April 2015.

We acknowledge the contributions of the following members of that working group, who were responsible for developing the first version of Essential TNM, as described in Piñeros et al. (2019): Kevin Ward, Eric Chokunonga, Morten Ervik, Helen Farrugia, Mary Gospodarowicz, Brian O'Sullivan, Isabelle Soerjomataram, Rajaraman Swaminathan, Ariana Znaor, and Freddie Bray.

We also acknowledge the technical support of Ms Biying Liu (African Cancer Registry Network).

Foreword

Documenting the anatomical extent of disease at presentation, or stage at diagnosis, is an integral part of cancer care, guiding decisions on appropriate cancer treatment for individual patients with cancer. Stage is equally valuable in assessing the efficacy of cancer care among all people within a community diagnosed with cancer. Population-based cancer registries (PBCRs) are the key source of such staging information and are front-line in measuring the effectiveness of cancer control implemented at the population level.

The TNM Classification of Malignant Tumours, published by the Union for International Cancer Control (UICC), is an internationally recognized standard that describes and categorizes cancer stage and progression. However, ensuring the routine availability of complete, comparable Tumour, Node, Metastasis (TNM) stage data is a particular challenge to many PBCRs, particularly in transitioning countries, either because the necessary investigations are not performed or because the relevant information is not recorded.

Since its inception in 2015, Essential TNM has sought to close

this gap by providing PBCRs with a means to provide comparable staging data via a simplified TNM system that complements the complete TNM classification. This user's guide, published with the International Association of Cancer Registries (IACR), the professional society of PBCRs, serves to aid cancer registrars in abstracting information on the extent of disease using Essential TNM. The coding flow charts provided for eight cancer types include relevant questions and diagrams to aid identification of the extent of disease. We hope that this publication, which is currently available online in English, French, Portuguese, and Spanish, will be of value to PBCRs in reporting comparable staging as part of their routine work.

At this juncture, and given that the cancer burden is expected to double in many transitioning countries in the next decades, it should go without saying that robust incidence and survival data by cancer type and stage are fundamental to the measurement of progress in cancer control. A coordinated approach to implementing national cancer plans, including scale-up of the World Health Organization

(WHO) signature cancer initiatives, must include a sustainable investment in PBCRs as a "best buy" surveillance system. As an example, as part of the WHO Global Breast Cancer Initiative, PBCRs are unique in being able to validate whether the benchmark of at least 60% of invasive breast cancers diagnosed and treated at early stages (I or II) is attained as part of the strengthening and scale-up of early detection and management services.

We would like to thank UICC and the TNM Working Group for their collaboration and support in this endeavour throughout. Further cancer types, related training courses, and translations into other languages are envisaged as part of our continued engagement with partners within the Global Initiative for Cancer Registry Development (GICR).

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Abbreviations

AFCRN	African Cancer Registry Network
FIGO	International Federation of Gynecology and Obstetrics
GICR	Global Initiative for Cancer Registry Development
IACR	International Association of Cancer Registries
IARC	International Agency for Research on Cancer
TNM	Tumour, Node, Metastasis
UICC	Union for International Cancer Control

Introduction and principles of Essential TNM

Introduction

This user's guide provides general instructions for abstracting information on extent of disease using Essential TNM. Site-specific coding flow charts are provided for selected cancer sites. Flow charts for additional cancer sites will be added as they become available.

Principles of Essential TNM

Essential TNM is a complement to the full Tumour, Node, Metastasis (TNM) classification, to assign cancer stage at diagnosis. It is for use by cancer registrars when either the traditional (or full) TNM stage group (I, II, III, or IV) or the TNM staging components (T, N, and M) have not been explicitly recorded in the patient's record.

Essential TNM follows a logical pathway documenting the furthest extent of disease in each patient with cancer using combined clinical and/or surgical/pathological information that is available via the completion of surgery (if it is performed).

If T, N, and/or M have been explicitly recorded by the treating clinician, these should be abstracted by the registrar. However, if one or more of these components are based on clinical evaluation (cTNM) and if surgical/pathological information has become available at a later date, the registrar may record the appropriate Essential TNM code if it differs from that in the patient's record.

In the event that neoadjuvant therapy (i.e. systemic therapy before surgery) is given, information used for staging purposes should include only procedures and records before the initiation of this therapy.

Essential TNM is composed of three key components that together summarize the extent of cancer in the patient at the time of diagnosis. The components are:

- M** Presence or absence of distant metastasis
- N** Presence or absence of regional lymph node metastasis or involvement
- T** Extent of invasion and/or size of the tumour.

The extraction of data from medical records is facilitated through the use of flow charts that include relevant questions and diagrams to help identify the extent of disease in different cancer sites. These flow charts correspond to the eighth edition of the Union for International Cancer Control (UICC) TNM classification (Brierley et al., 2017).

Coding the components of Essential TNM

The components of Essential TNM follow the eighth edition of the full TNM classification (Brierley et al., 2017) and are as follows.

Metastasis (M)

M+ Presence of distant metastasis, clinically or pathologically

M- No mention of distant metastasis

- Distant metastasis (M) means that the original tumour (primary tumour) has spread to distant organs or distant (non-regional) lymph nodes.
- M is based on the best available information, whether clinical information, findings during surgery, images, or pathological information.
- If pathological information is available to inform decisions about involvement by cancer, that is preferred to clinical appraisal of the same tumour location.
- For coding M, clinical signs and findings are enough to justify metastasis (M+) in the absence of pathological confirmation of metastatic deposits.
- Do not code metastasis that is known to have developed after the diagnosis was established.
- If there is no mention of distant metastasis, code as M-.
- If distant metastasis can be established, there is no need to look further in the record for regional

node involvement or tumour size or extension.

Regional lymph node metastasis or involvement (N)

R+ Presence of regional node metastasis or involvement, clinically or pathologically

R2 – Regional node metastasis is advanced

R1 – Regional node metastasis is limited

R- No mention of regional node metastasis

- Involvement of lymph nodes implies that the tumour has spread via the lymphatic system and cancer cells are found in the lymph nodes that drain the specific organ.
- N is based on the most specific data available to confirm the presence or absence of regional node involvement and is generally coded from the pathology report. An “enlarged” or “palpable” node does not constitute involvement on the basis of those words alone.
- N can be coded from the clinical record, typically from imaging or during surgical observation, in the absence of pathological confirmation.
- The definition of regional nodes is cancer site-specific, as can be seen in the figures for each cancer site.

Code as R+ in the presence of documented regional lymph node involvement and as R- otherwise.

- If more detailed information is available and it is relevant for a given cancer site, R+ can be further classified as R2, representing advanced nodal involvement, or R1, representing limited nodal involvement.
- If lymph node involvement (R+) has been established but no further information is available about the number and location of nodes, R+ is assumed. In such a situation, the case will be allotted to the lower stage category (following Rule 4 of the TNM system).

Extent of invasion and/or size of the tumour (T)

A Extent of invasion and/or tumour size is **advanced**

A2 – Extent of invasion and/or tumour size is very advanced

A1 – Extent of invasion and/or tumour size is advanced

L Extent of invasion and/or tumour size is **limited**

L2 – Extent of invasion and/or tumour size is limited

L1 – Extent of invasion and/or tumour size is very limited

X Extent of invasion and/or tumour size cannot be assessed

- T is based on the most specific data available to confirm the extent of invasion within or through the involved organ and/or the size of the primary tumour (depending on the cancer site).
 - T is generally coded from the pathology report or, in the absence of pathological confirmation, from the clinical record (endoscopy, X-rays, palpation, etc.).
 - The results from pathological examination of surgical specimens take precedence over imaging, and imaging takes precedence over cytology or biopsy.
 - The definition of extent of invasion is cancer site-specific.
 - Use the site-specific figures to help code the extent of invasion to the most specific category possible.
- Absence of specific information on metastasis, nodes, and tumour size or extent of invasion**
- Code based on what is known from the record.
 - For M and N, if there is no information on their presence, assume that they are absent (M-, R-).
 - If regional nodes are mentioned but it is not possible to distinguish between advanced and limited metastasis for regional nodes, code as R+.
 - In a similar manner, for T, if it is not possible to distinguish degrees of tumour extension (2 vs 1), code T as simply A or L (depending on the cancer site; see the flow charts).
 - Refer to the specific cancer sites for assessing advanced or limited status.
 - For T, X should be recorded if there is known to be a primary tumour but there is no description of its size or extent of invasion.

Assigning the Essential TNM stage group

Once the Essential TNM components have been coded, the components can be combined into stage groups ranging from I to IV with increasing severity of disease.

- **Stage IV** for cancers with distant metastasis.
- **Stage III** and **Stage II** for cancers with increasing local and regional node involvement.
- **Stage I** is typically assigned to cancers that are localized within the organ of origin.
- The rules for combining the Essential TNM components into stage groups (I–IV) are provided on a site-specific basis.

The stage groups were designed to group patients with cancer with similar prognosis.

Guidelines for abstraction of information from medical records

The following guidelines aim to provide help in abstracting information on stage from medical records.

- Quickly review the entire record for overall organization. Note the range of service dates and the different facilities involved in the care of the patient.
- Identify definitive reports (operative, pathology, imaging), and note the dates and results on each report.
- Try to rule out distant metastatic disease first.
- Because distant metastasis is more frequent to the bone, lung, or brain, it is practical to look in
 - **imaging reports** for any mention of distant metastasis. If metastasis is mentioned, remember to verify whether this was close to the time of diagnosis.
 - **operative reports or notes** for any indication of liver metastasis or tumour deposits indicating distant metastasis.
- Regional lymph nodes: Common expressions that imply spread to regional lymph nodes are “lymph node metastasis” and “involvement of local lymph nodes”.
- As illustrated in the flow charts (Figures 1–8), the **names of the regional lymph nodes** are specific for each cancer site and must be checked against the clinical record. If the involved node is not in the list of regional nodes, consider it to be a distant node.

Entering Essential TNM in databases

For pragmatic reasons, it is acceptable to use the already existing fields to code the TNM stage group and TNM components if they exist, and to enter the codes used for Essential TNM as described above: M+, M-, R+, R-, R2, R1, A, A2, A1, L, L2, L1. Depending on the extension of the tumour, the number of components to be entered into the database will vary; if there is evidence of distant metastasis, it may be only M+.

For databases that do not allow varying code length (one vs two characters), two characters should be used for all codes. In this situation, it is recommended to code A, L, and X as AX, LX, and XX, respectively. It is recommended to include a dictionary according to the description in Table 1, so that the user can select the required code from a menu.

Table 1. Recommended codes for T, N, and M

Classification	T		N		M		
	Stage	Code	Stage	Code	Stage	Code	
TNM	TX	X	NX	X	MX	X	
	T1	1	N0	0	M0	0	
	T1a	1A	N1	1	M1	1	
	T1b	1B	N1a	1A			
	T1c	1C	N1b	1B			
	T2	2	N1c	1C			
	T2a	2A	N2	2			
	T2b	2B	N2a	2A			
	T2c	2C	N2b	2B			
	T3	3	N2c	2C			
	T3a	3A	N3	3			
	T3b	3B	N3a	3A			
	T3c	3C	N3b	3B			
	T4	4	N3c	3C			
	T4a	4A					
	T4b	4B					
	T4c	4C					
	Essential TNM	A	AX	R+	R+	MX	X
		A1	A1	R-	R-	M+	M+
A2		A2	R1	R1	M-	M-	
L		LX	R2	R2			
L1		L1					
L2		L2					

Note: MX, which is not used in the eighth edition of the TNM classification (Brierley et al., 2017), is included in case it is mentioned in a clinical record.

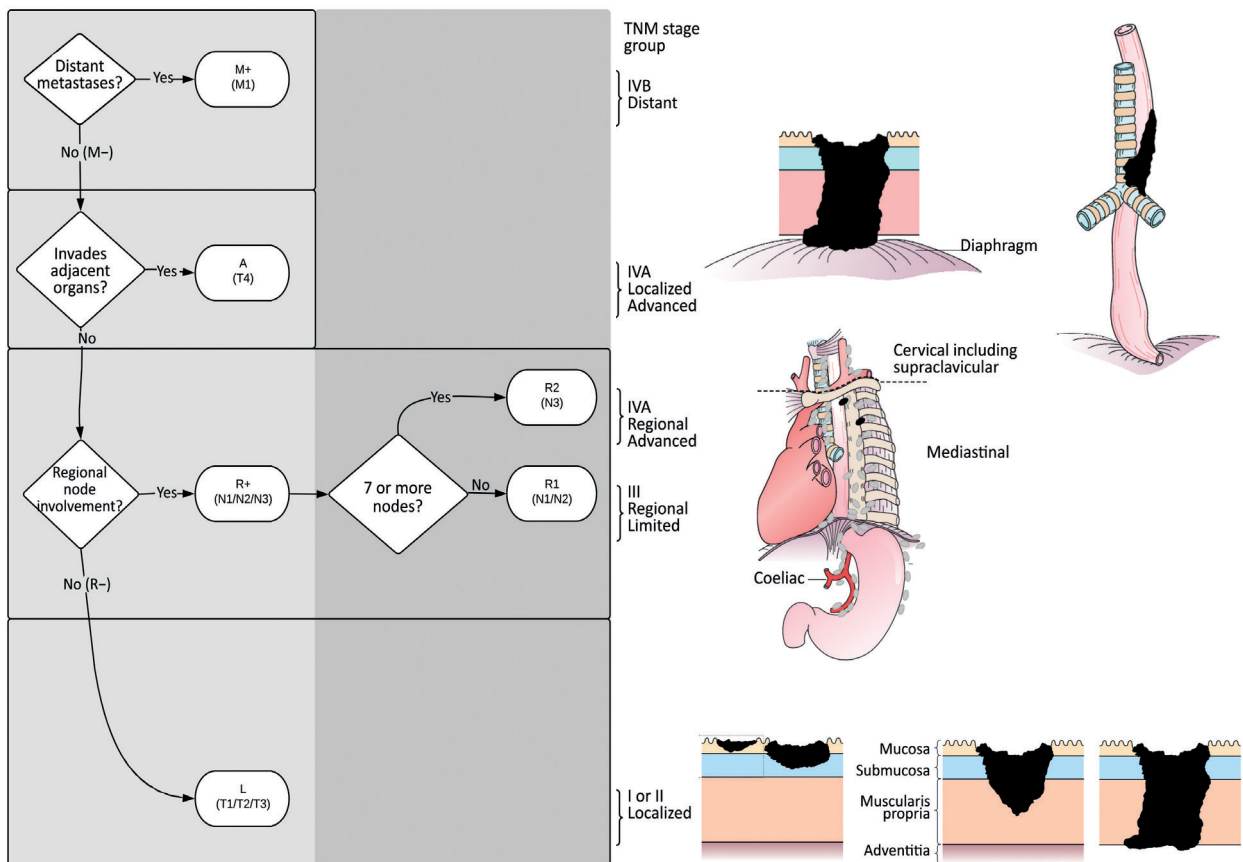
Oesophageal cancer

Essential TNM

Key points for oesophageal cancer staging

1. The classification is for squamous cell carcinomas and aims to divide cancers into those that are operable (localized) and those that are not.
2. Metastasis is most common to the liver, lung, distant lymph nodes, and bone.
3. Regional lymph nodes are those in the oesophageal drainage area, including coeliac axis nodes and para-oesophageal nodes in the neck but not the supraclavicular nodes.
4. Look for tumour extension to adjacent organs (pleura, pericardium, azygos vein, diaphragm, peritoneum, aorta, vertebral body, trachea); the tumour is advanced (T4).

Fig. 1. Oesophageal cancer Essential TNM flow chart. A, advanced extension; L, localized extension; M, distant metastasis; R, regional lymph nodes; TNM, Tumour, Node, Metastasis.

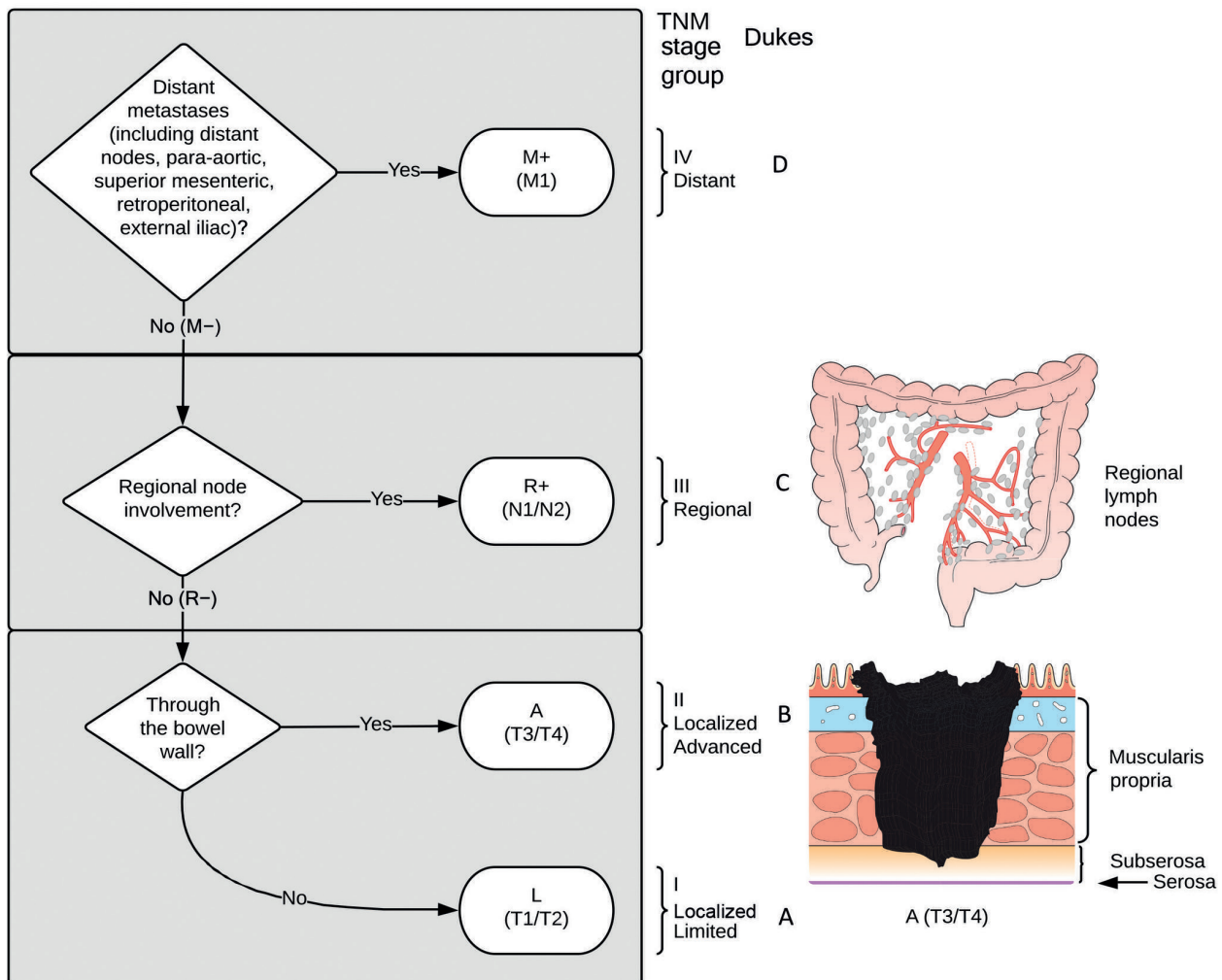


Colorectal cancer Essential TNM

Key points for colorectal cancer staging

1. Metastasis is most common to the liver. This may be clinically documented in operative reports or on imaging.
2. Regional nodes are site-specific for each segment of the colon or rectum and are named accordingly (epicolic, mesenteric, paracolic, ileocolic, rectal; see Table 2).
3. Tumour deposits (satellites) are cancer nodules that are separate from the primary tumour, located in the same area as the regional lymph nodes (pericolic or perirectal tissues). It is assumed that they represent lymph node involvement, and they are coded as R+.
4. Look for tumour extension through the wall of the colon or rectum into the subserosa or beyond, rather than tumour size.

Fig. 2. Colorectal cancer Essential TNM flow chart. A, advanced extension; L, localized extension; M, distant metastasis; R, regional lymph nodes; TNM, Tumour, Node, Metastasis.



Colorectal cancer

Essential TNM (cont.)

Table 2. Regional lymph nodes for each segment of the colon or rectum

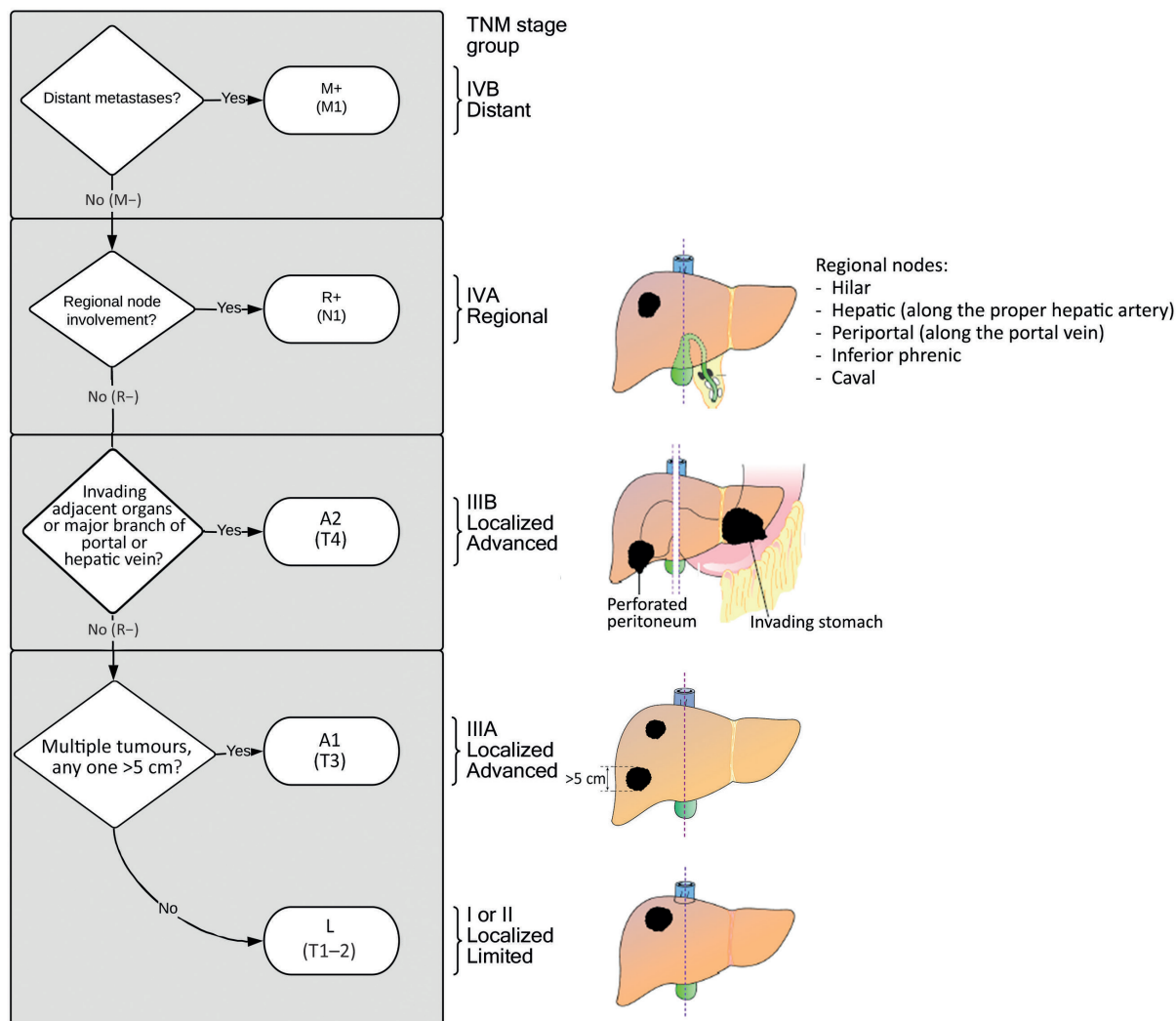
Organ	Segment	Regional lymph nodes
Colon	Caecum	Pericolic, ileocolic, right colic
	Ascending colon and hepatic flexure	Pericolic, ileocolic, right colic, middle colic
	Transverse colon and splenic flexure	Pericolic, middle colic, left colic
	Descending colon	Pericolic, left colic, sigmoid, inferior mesenteric
	Sigmoid and rectosigmoid	Pericolic, sigmoid, inferior mesenteric, superior rectal (haemorrhoidal)
Rectum	Rectum	Mesorectal, superior rectal (haemorrhoidal), inferior mesenteric, internal iliac, inferior rectal

Liver cancer Essential TNM

Key points for liver cancer staging

1. The classification is for hepatocellular carcinomas and aims to divide cancers into those that are operable (localized or limited) and those that are not.
2. Metastatic disease includes ascites with evidence of malignant spread to the peritoneum.
3. Regional lymph nodes are the hilar, hepatic (along the proper hepatic artery), periportal (along the portal vein), inferior phrenic, and caval nodes.
4. Look for tumour extension into a major branch of the portal or hepatic vein, direct invasion of adjacent organs other than the gallbladder (including the diaphragm), or perforation of the visceral peritoneum; the tumour is advanced (T4).
5. If it involves only the liver (or the liver and the gallbladder), look for the number of tumours in the liver; if none measures more than 5 cm, it is limited, otherwise it is advanced (T3).

Fig. 3. Liver cancer Essential TNM flow chart. A, advanced extension; L, localized extension; M, distant metastasis; R, regional lymph nodes; TNM, Tumour, Node, Metastasis.

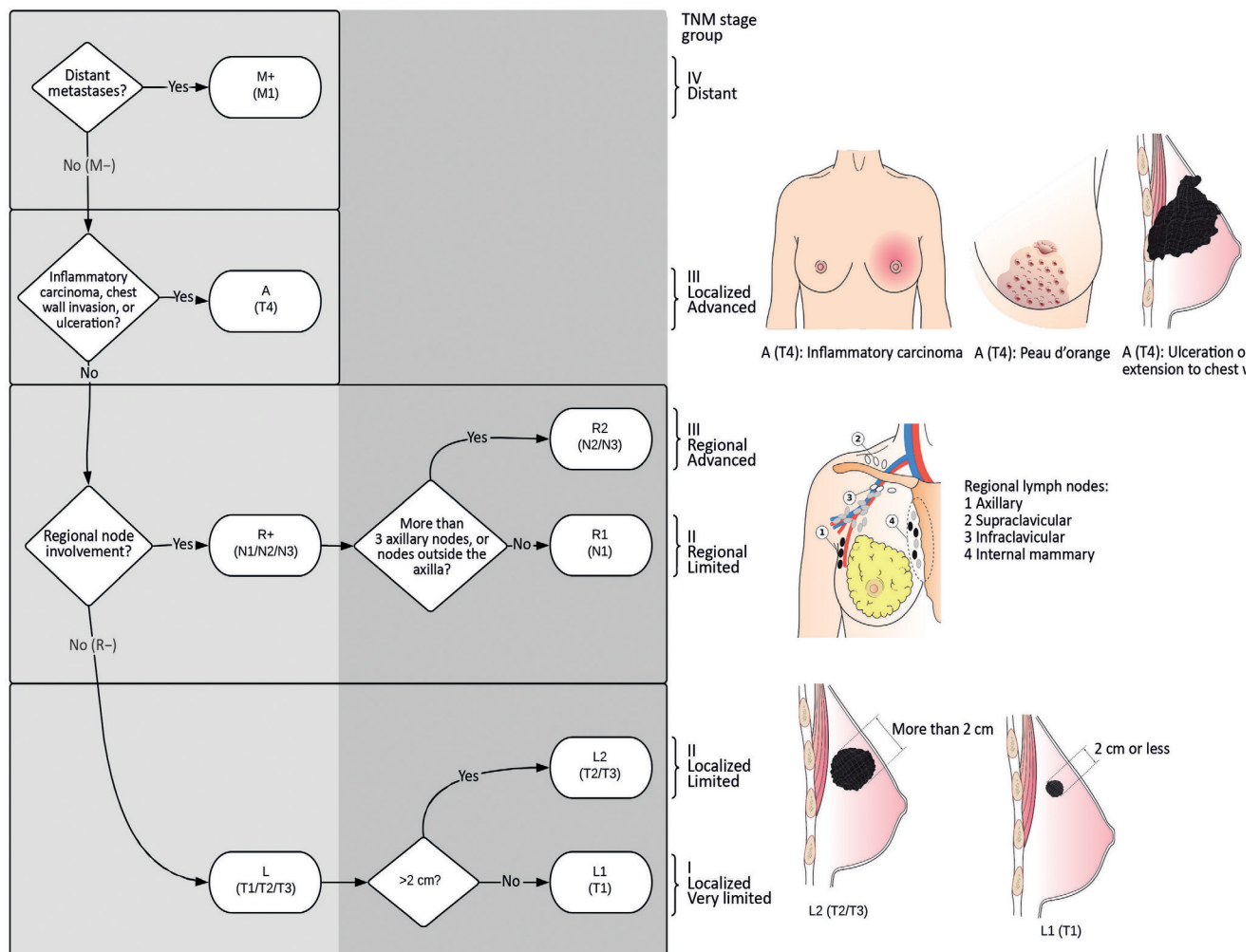


Breast cancer Essential TNM

Key points for breast cancer staging

1. Metastasis is common to the bone, lung, and brain. Look for evidence on imaging.
2. Remember that lymph nodes on the opposite (i.e. contralateral) side or in the neck are distant metastases (M+).
3. If M+, Stage IV can be assigned and there is no need to look for further information.
4. Look for tumour extension to breast skin (epidermis).
5. Regional lymph nodes are the axillary (including intramammary), infraclavicular, internal mammary, and supraclavicular nodes **on the same side as the tumour** (see the diagrams in Fig. 4).
6. If lymph node involvement (R+) has been established but no further information is available about the number and location of nodes, R+ is assumed. In such a situation, the case will be allotted to the lower stage category (following Rule 4 of the TNM system), for example to Stage II Regional Limited.
7. Size of the tumour is a critical aspect, and a tumour that measures 2 cm or less is very limited (Stage I).
8. If two malignant tumours are present in the same breast, use the biggest one to stage.

Fig. 4. Breast cancer Essential TNM flow chart. A, advanced extension; L, localized extension; M, distant metastasis; R, regional lymph nodes; TNM, Tumour, Node, Metastasis.

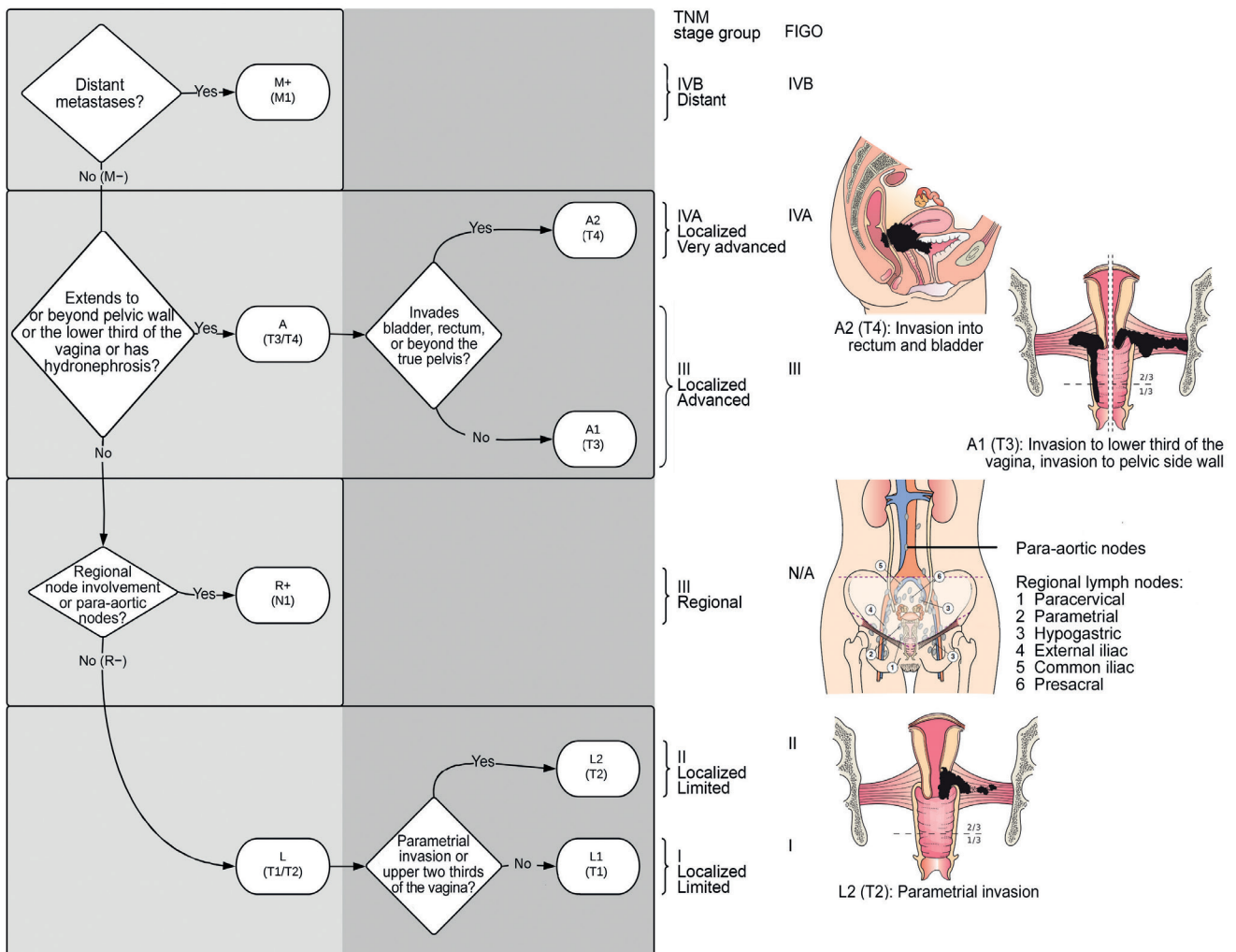


Cervical cancer Essential TNM

Key points for cervical cancer staging

1. Distant metastasis is common to the bone, lung, and brain. Look for evidence on imaging.
2. Invasion of the tumour into the bladder, the rectum, or beyond the pelvis is very advanced (A2) and is considered Stage IV.
3. Regional lymph nodes are those of the pelvis: the paracervical, parametrial, hypogastric (internal iliac, obturator), common iliac, external iliac, presacral, and lateral sacral nodes. When looking for information on regional nodes, look also for mention of para-aortic nodes.
4. Look for tumour extension to the lower third of the vagina, or to the wall of the pelvis, or hydronephrosis due to obstruction of the ureter.
5. Most cervical cancers are staged using the International Federation of Gynecology and Obstetrics (FIGO) system, for which the codes for stage (I–IV) are the same as those of the TNM system.

Fig. 5. Cervical cancer Essential TNM flow chart. A, advanced extension; FIGO, International Federation of Gynecology and Obstetrics; L, localized extension; M, distant metastasis; N/A, not applicable; R, regional lymph nodes; TNM, Tumour, Node, Metastasis.

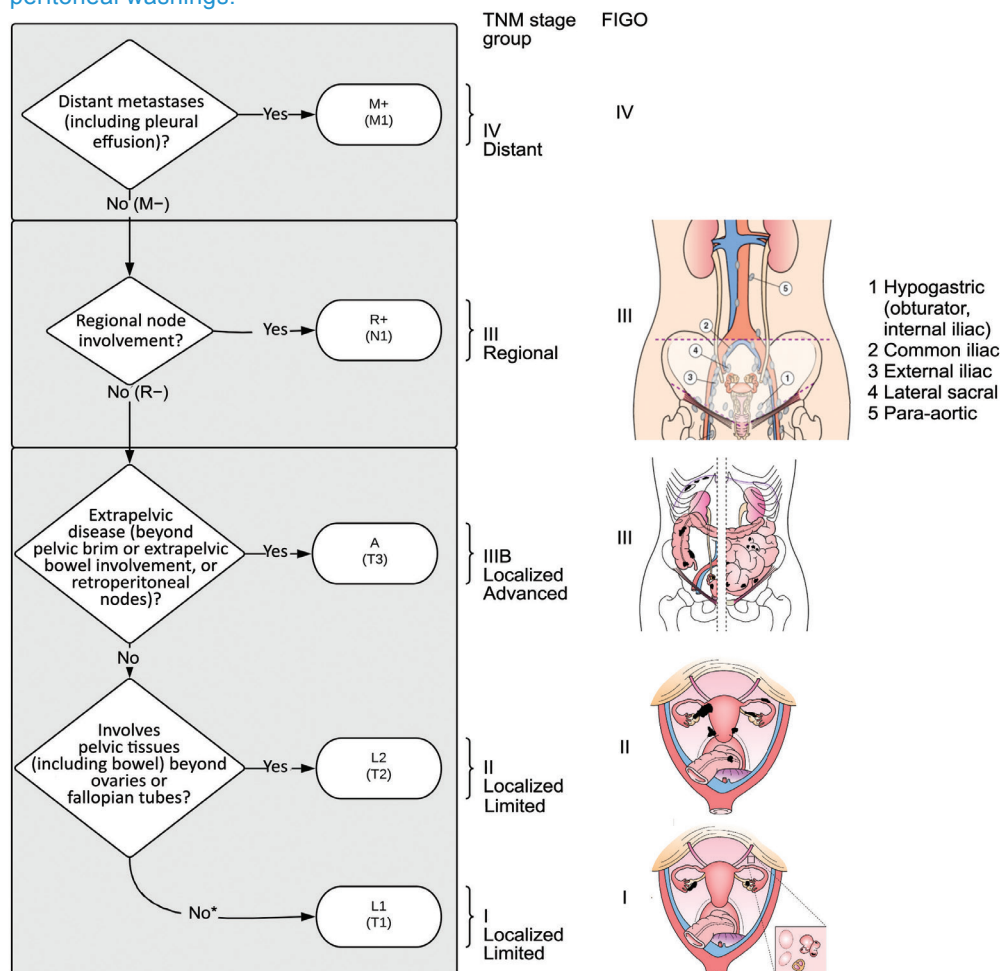


Ovarian cancer Essential TNM

Key points for ovarian cancer staging

1. The classification applies to malignant ovarian neoplasms of both epithelial and stromal origin, including those of borderline malignancy or of low malignant potential. It is also to be used for carcinomas of the fallopian tubes.
2. Metastases in the abdomen must involve the parenchyma (internal part) of organs (especially the liver) and not just the outer capsule. Spread to extra-abdominal organs and lymph nodes outside the abdominal cavity (including inguinal lymph nodes) is distant metastasis. Spread of the tumour to the peritoneum is local spread.
3. Regional lymph nodes are the paracervical, parametrial, hypogastric (internal iliac, obturator), common iliac, external iliac, presacral, lateral sacral, and para-aortic nodes.
4. Look for tumour extension beyond the pelvis (including to the peritoneum) or to the retroperitoneal lymph nodes; the tumour is advanced. If it is still **within** the pelvis, even with spread to the bowel and/or peritoneum, the tumour is localized.
5. Most ovarian cancers are staged using the FIGO system, which does not consider regional lymph node involvement but for which the codes for stage (I–IV) are otherwise identical to those of the TNM system.

Fig. 6. Ovarian cancer Essential TNM flow chart. A, advanced extension; L, localized extension; M, distant metastasis; R, regional lymph nodes; TNM, Tumour, Node, Metastasis. *Includes malignant cells in ascites or peritoneal washings.

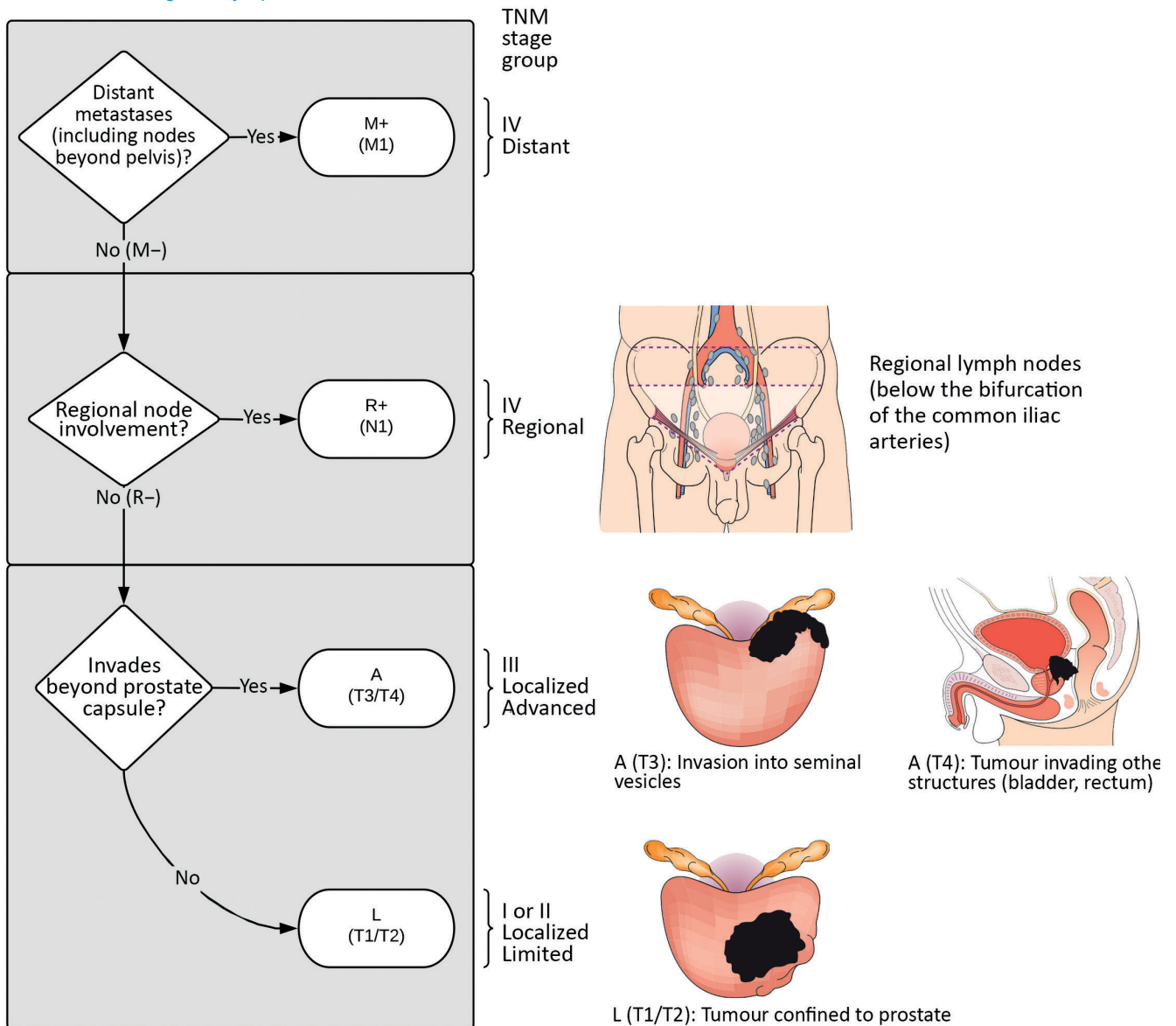


Prostate cancer Essential TNM

Key points for prostate cancer staging

1. Distant metastasis is most common to the bone. Look for evidence of this on imaging.
2. Remember that **distant nodes beyond the pelvis** are M+; these include the following nodes: aortic (para-aortic, lumbar), common iliac, inguinal (femoral and deep), supraclavicular, cervical, scalene, and retroperitoneal.
3. Regional nodes are those of the true pelvis (the pelvic nodes below the bifurcation of the common iliac arteries: obturator, periprostatic, perivesical, pelvic, iliac, sacral, and hypogastric).
4. Look for tumour extension beyond the prostate capsule; if it is confined to the prostate, the tumour is localized (L).

Fig. 7. Prostate cancer Essential TNM flow chart. A, advanced extension; L, localized extension; M, distant metastasis; R, regional lymph nodes; TNM, Tumour, Node, Metastasis.

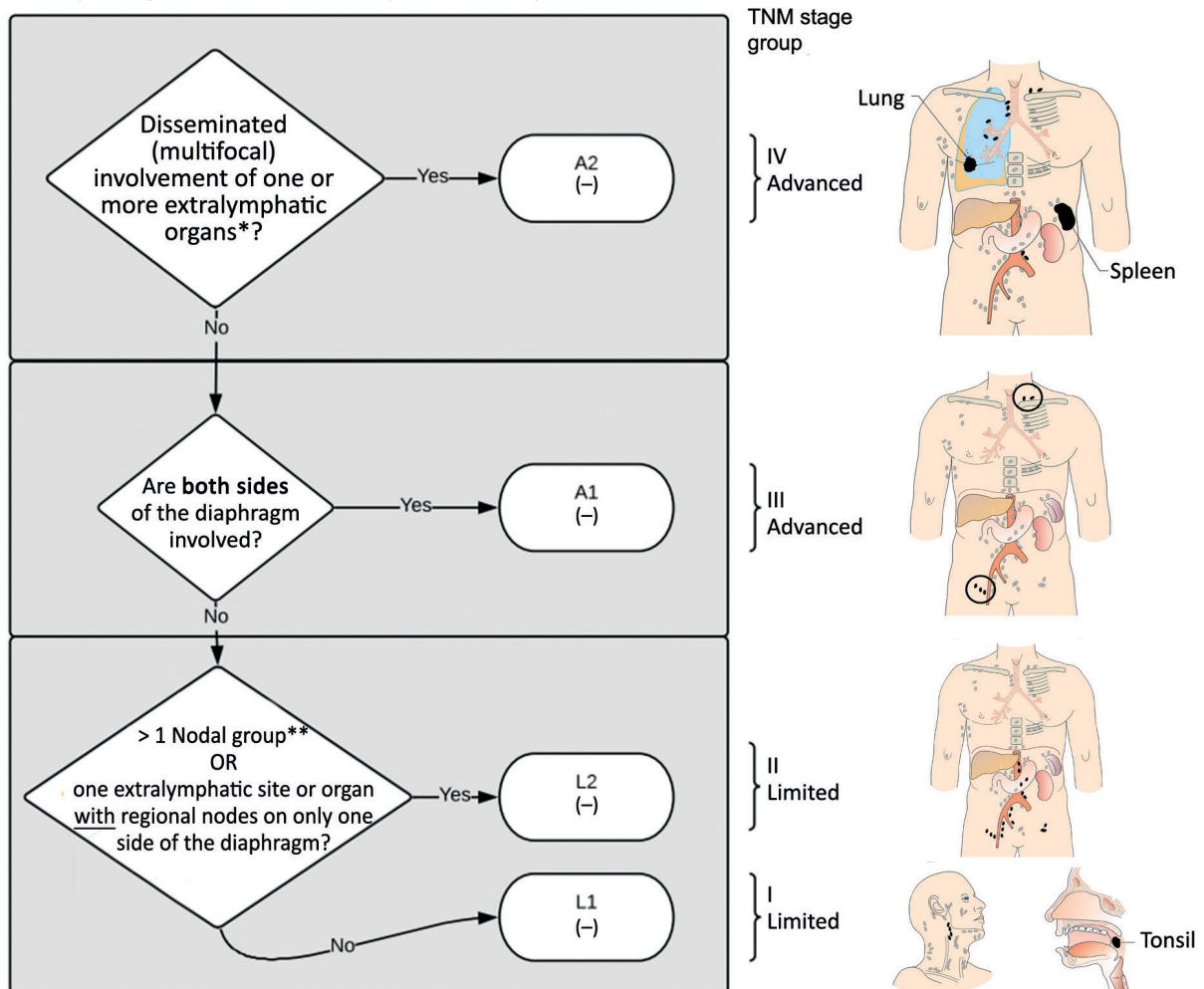


Lymphoma Essential TNM

Key points for lymphoma staging

1. The TNM and Essential TNM classification for lymphomas applies to both Hodgkin lymphoma and non-Hodgkin lymphoma.
2. Remember that lymphomas can have lymphatic and extralymphatic disease.
 - Lymphatic disease involves lymph nodes as well as other lymphatic structures such as the Waldeyer ring (the tonsils), the spleen, the appendix, the thymus, and Peyer patches (lymphoid tissue in the small intestine).
3. Staging of lymphomas may include an initial report of a bone marrow biopsy.
4. Look for documentation of disseminated (multifocal) involvement of one or more extralymphatic organs (such as the bone marrow, brain, liver, lung, and gastrointestinal tract). This is advanced disease (Stage IV).
5. Look for involvement of lymphatic nodes on both sides of the diaphragm, which **may** be accompanied by involvement of the spleen. This is advanced disease (Stage III).

Fig. 8. Lymphoma Essential TNM flow chart. A, advanced extension; L, localized extension; TNM, Tumour, Node, Metastasis. *The most common extralymphatic organs include the bone marrow, brain, liver, lung, and gastrointestinal tract, but any organ can be involved by lymphoma. **Nodal group = lymphatic structures including lymph node(s), Waldeyer ring, spleen, appendix, thymus, and Peyer patches.



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