Coding stage:

Haematological Malignancies

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UICC, TNM 8th edition, 2016

Contents

European Network of Cancer Registries

Lugano classification

- The current Lugano staging classification for Lymphoma is a modification of the Ann Arbor classification (Consensus conference, Lugano, 2012)
- Previously used staging laparotomy and the resulting pathological staging classification = obsolete
- The Lugano classification is also used to evaluate response to therapy

Lugano classification: Hodgkin Lymphoma

=> Also for Children

Limited Stage

- ***Stage I***

  Involvement of a single lymph node region (I), or localized involvement of a single extralymphatic organ or site (IE).

- ***Stage II***

  Involvement of **≥2 lymph node regions** on the same side of the diaphragm (II),
  or localized involvement of a single extralymphatic organ or site and its regional lymph node(s) +/- involvement of other contiguous lymph node regions on the same side of the diaphragm (IIE).

- ***Bulky Stage II***

  Stage II disease with a single nodal mass > than 10 cm in maximum dimension **or** greater than a 1/3 of the thoracic diameter as assessed on CT.

Lugano Classification: Hodgkin lymphoma (2)

Advanced Stage

Stage III

Involvement of **lymph node regions on both sides** of the diaphragm (III), +/- involvement of the **spleen** (IIIS)

Stage IV

Disseminated (**multifocal) involvement** of ≥1 extralymphatic organs, +/- associated lymph node involvement; or non-contiguous extralymphatic organ involvement with involvement of lymph node regions on the same or both sides of the diaphragm.

A and B Classification (Symptoms)

1. Unexplained weight loss of more than 10% of the usual body weight in the 6 months prior to first attendance
2. Unexplained fever with temperature above 38 °C
3. Night sweats

Note: Pruritus alone does not qualify for B classification, nor a short febrile illness associated with a known infection

Lugano classification: Non-Hodgkin Lymphoma

- Also Lugano classification
- **No A and B classification**

- **Only adults**

- **Stage II disease, bulk definition**:
  - >6 cm in Follicular Lymphoma
  - >10 cm for Diffuse Large Cell Lymphoma

Non-Hodgkin lymphoma – (Paediatric)

- **Tier 1**
  - Advanced: Involvement of bone marrow and/or CNS
  - Limited: No involvement of bone marrow or CNS

- **Tier 2**: The St Jude/Murphy system is recommended

  - Stage I Involvement of a **single tumour mass or nodal area**, excluding the mediastinum and abdomen

  - Stage II Involvement of a **single tumour mass with regional node(s)** or **two or more tumours and/or nodal regions on the same side of the diaphragm**, or a completely resected primary GI tract tumour +/-regional nodal involvement

  - Stage III Tumour masses and/or regional nodes on **opposite sides of the diaphragm** or **primary intrathoracic tumour** (mediastinal, pleural or thymic) or extensive **primary intra-abdominal** disease or **paraspinal tumour or epidural tumour**

  - Stage IV Involvement of **bone marrow** and/or **central nervous system**

Other haematological staging systems

- **Myeloma**
  - (Revised) International Staging System: (R)ISS 2015: Stage I-III, based on:
    - The amount of albumin in the blood
    - The amount of beta-2-microglobulin in the blood
    - The amount of LDH in the blood
    - The specific gene abnormalities (cytogenetics) of the cancer.

  - Durie - Salmon : amount of myeloma and ‘damage’ it has caused (anemia, bone disease)

- **CLL**
  - BINET stage
    - **Binet stage A:** Fewer than 3 areas of lymphoid tissue are enlarged, with no anemia or thrombocytopenia.
    - **Binet stage B:** 3 or more areas of lymphoid tissue are enlarged, with no anemia or thrombocytopenia.
    - **Binet stage C:** Anemia and/or thrombocytopenia are present. Any number of lymphoid tissue areas may be enlarged

  - RAI : divides CLL into 5 stages based on the results of blood tests and a physical examination

- Exercises Lymphoma – Lugano classification

- https://create.kahoot.it/share/lugano-staging-exercises/91c356ae-4859-43e4-91d5-6fa7c0038b00

Coding stage:

Toronto Paediatric Cancer Stage Guidelines

Liesbet Van Eycken

Paediatric tumours: Stage

- Adult cancers
  - Main method of staging = TNM classification (UICC/AJCC)

- Childhood cancers
  - Heterogeneous, rare
  - TNM not applicable for most paediatric cancers
  - Mostly staged by disease-specific staging systems
    - Different systems for the same disease
    - Differences between countries

- Need for consistency in collection of staging data
  → Facilitate international comparisons and studies

Toronto consensus meeting

- October 2014 in Toronto, Canada
- 26 international experts (from 17 countries, 6 continents)
  - Variety in expert fields, geography, resource settings
- Tiered staging system with adaptations for low-income countries (fewer resources, limited/no advanced imaging)
  - Tier 1: for registries with limited resources
  - Tier 2: for well-resourced cancer registries
  - Tier 3: optional additional prognostic factors
- Recommendations for staging systems to be used by cancer registries for 18 major childhood malignancies

Toronto consensus principles and guidelines

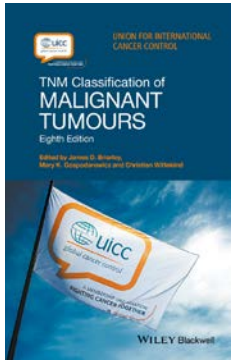
- Published in: Lancet Oncol 2016;17: 163–72

Paediatric cancer stage in population-based cancer registries: the Toronto consensus principles and guidelines

Sumit Gupta, Joanne F Aitken, Ute Bartels, James Brierley, Mae Dolendo, Paola Friedrich, Soad Fuentes-Alabi, Claudia P Garrido, Gemma Gatta, Mary Gospodarowicz, Thomas Gross, Scott C Howard, Elizabeth Molyneux, Florencia Moreno, Jason D Pole, Kathy Pritchard-Jones, Oscar Ramirez, Lynn A G Ries, Carlos Rodriguez-Galindo, Hee Young Shin, Eva Steliarova-Foucher, Lillian Sung, Eddy Supriyadi, Rajaraman Swaminathan, Julie Torode, Tushar Vora, Tezer Kutluk, A Lindsay Frazier

- Endorsed by the UICC and included in the TNM 8th edition

- 2nd Consensus meeting, Lyon, 21st of October 2019



Content Paediatric Tumours (TNM 8th edition UICC)

- Gastro-intestinal Tumours
  - Hepatoblastoma: Tier 1 and 2
- Bone and Soft Tissue Tumours
  - Osteosarcoma Tier 1 and 2
  - Ewing Sarcoma Tier 1 and 2
  - Rhabdomyosarcoma Tier 1 and Tier 2 (modified TNM)
  - Soft Tissue Sarcoma other than Rhabdomyosarcoma: Tier 1 and 2 (TNM)
- Gynaecologic Tumours: Ovary Tier 1 and Tier 2 (TNM-FIGO)
- Urological Tumours
  - Wilms Tumour Tier 1 and Tier 2 (2 Tier 2 systems: 1 after surgical resection prior to chemo, SIOP if preop chemo)
- Ophtalmic Tumours
  - Retinoblastoma Tier 1 and Tier 2 (determined after enucleation = pathologic classification)/ IRSS (Internat. Class for Intraocular RB)
- Malignant Lymphoma
  - Hodgkin Lymphoma
  - Non Hodgkin Lymphoma Tier 1 and Tier 2 St Jude/Murphy system
- Central Nervous System
  - Medulloblastoma and Ependymoma Tier 1 and Tier 2
  - Neuroblastoma Tier 1 and Tier 2 (International Neuroblastoma Risk Group Staging System (INRGSS)

Paediatric tumours: Hepatoblastoma

- **Tier 1 and 2**
  - Metastatic: distant metastasis present
  - Localised: Tumour confined to the liver including regional lymph nodes

  - Paediatric Oncology: ‘Pretext classification’
    (will probably move from tier 3 => tier 2)

Paediatric cancer: Rhabdomyosarcoma

Tier 1

Metastatic	Distant metastases present
Localized	Tumour confined to the area of origin including regional lymph nodes

Prognostic Grouping

The prognostic grouping for rhabdomyosarcoma includes favourable anatomic sites and unfavourable anatomic sites.

Favourable anatomic sites: Orbit, head and neck(excluding parameningeal tumours) and genitourinary sites (excluding bladder and prostate tumours)

Unfavourable anatomic sites: Bladder, prostate, extremity, cranial, parameningeal, trunk, retroperitoneum and all other sites not noted as favourable

Stage I	Any T	Any N	M0	Favourable Site
Stage II	T1a, T2a	N0	M0	Unfavourable Site
Stage III	T1a, T2a	N1	M0	Unfavourable Site
	T1b, T2b	Any N	M0	Unfavourable Site
Stage IV	Any T	Any N	M1	Any Site

Tier 2

A modified TNM Clinical Classification with the addition of favourable or non-favourable tumour site.

T – Primary Tumour*

TX	Primary tumour cannot be assessed
T0	No evidence of primary tumour
T1	Confined to a single anatomic site
T1a	Tumour 5 cm or less in greatest dimension
T1b	Tumour more than 5 cm in greatest dimension
T2	Extension beyond anatomic site
T2a	Tumour 5 cm or less in greatest dimension
T2b	Tumour more than 5 cm in greatest dimension

N – Regional Lymph Nodes

NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Regional lymph node metastasis

	Tier 1 staging system	Tier 2 staging system
ALL	CNS neg/ pos	CNS 1/ 2/ 3
AML	CNS neg/ pos	CNS neg/ pos
CML	(none)	(none)
Hodgkin's lymphoma	Ann Arbor stage I/ II/ III/ IV A/ B	Ann Arbor stage I/ II/ III/ IV A/ B
Non-Hodgkin lymphoma	Limited/Advanced	St Jude/Murphy stage I/ II/ III/ IV
Neuroblastoma	Localised/ Locoregional/ Metastatic/ INRGSS - MS disease	INRGSS - Localised L1/ Locoregional L2/ Metastatic M/ MS disease
Wilms' tumour	Localised/ Metastatic	NWTSG or SIOP stage I/ II/ III/ IV
Rhabdomyosarcoma	Localised/ Metastatic	TNM stage I/ II/ III/ IV
Non-rhabdomyosarcoma soft-tissue sarcomas	Localised/ Metastatic	TNM stage I/ II/ III/ IV
Osteosarcoma	Localised/ Metastatic	Localised/ Metastatic
Ewing's sarcoma	Localised/ Metastatic	Localised/ Metastatic
Retinoblastoma	Localised (intraocular) / Regional (orbital or regional lymph nodes) / Distant (extra-orbital)	IRSS stage 0/ I/ II/ III/ IV
Hepatoblastoma	Localised/ Metastatic	Localised/ Metastatic
Testicular	Localised/ Regional/ Metastatic	TNM stage I/ II/ III
Ovarian	Localised/ Regional/ Metastatic	FIGO stage I/ II/ III/ IV
Astrocytomas	(none)	(none)
Medulloblastoma and other CNS embryonal tumours	M0 or localised/ M+ or metastatic	M0/ 1/ 2/ 3/ 4
Ependymoma	M0/ M+	M0/ 1/ 2/ 3/ 4

TNM 8th edition and Paediatric Tumours

- ALL and AML: Stage not published in the TNM booklet

- Neuroblastoma Tier 2 is not specified in the TNM booklet
  - INRGSS: International Neuroblastoma Risk Group Staging System

    Stage L1: Locoregional tumor without Imaging derived risk factors (IDRFs)
    Stage L2: Locoregional tumor with one or more IDRFs
    Stage M: Distant metastatic disease (except Ms)
    Stage Ms: INRG Stage L1 or L2 tumor with metastatic disease confined to skin and/or liver and/or bone marrow

	Tier 1 staging system	Tier 2 staging system	Comments
Acute lymphoblastic leukaemia	CNS negative	CNS 1[28]	Collection of testicular involvement not endorsed given rarity and uncertain prognostic value in first presentation disease; white blood cell count at presentation was not considered reflective of stage
	CNS positive	CNS 2	
	CNS positive	CNS 3	
Acute myeloid leukaemia	CNS negative	CNS negative[29]	..
	CNS positive	CNS positive	
Chronic myeloid leukaemia	None	None	No relevant staging system identified or necessary
Hodgkin's lymphoma	Ann Arbor—stage IA/B[30] Ann Arbor—stage IIA/B Ann Arbor—stage IIIA/B Ann Arbor—stage IVA/B	Ann Arbor—stage IA/B[30] Ann Arbor—stage IIA/B Ann Arbor—stage IIIA/B Ann Arbor—stage IVA/B	Used in both adult and paediatric populations; recent proposals in adult populations to move to more simplified limited *vs* advanced staging classifications[31] not yet evaluated in paediatric populations; multi-tiered staging systems deemed not appropriate
Non-Hodgkin lymphoma	Limited	St Jude/Murphy—stage I[32]	Tier 1 advanced stage indicates CNS or bone marrow involvement; although some clinicians will use Ann Arbor staging for non-Hodgkin lymphoma, St Jude/Murphy more often used in paediatric populations; Ann Arbor stage IV will often correspond to Tier 1 advanced stage disease; whether Ann Arbor or St Jude/Murphy staging systems were used by clinicians can be difficult to ascertain from medical charts
	Limited	St Jude/Murphy—stage II	
	Limited	St Jude/Murphy—stage III	
	Advanced	St Jude/Murphy—stage IV	
Neuroblastoma	Localised	INRGSS—localised L1[33]	MS disease refers to children younger than 18 months with metastases confined to skin, liver, or bone marrow; the first two stages of the Tier 1 system are intended to be simplified proxies of INRGSS L1 and L2 not dependent on adequate assessment of imaging-defined risk factors
	Locoregional	INRGSS—locoregional L2	
	Metastatic	INRGSS—metastatic M	
	INRGSS—MS disease	INRGSS—MS disease	

	Tier 1 staging system	Tier 2 staging system	Comments
Wilms' tumour	Localised	Stage I[35]/y-stage I[35]	y designates that staging assessment was performed after neoadjuvant therapy was given, which allows the staging system to accommodate both SIOP and COG/NWTSG-based treatment strategies;[15] in cases of bilateral disease the stage of the most advanced kidney should be recorded
	Localised	Stage II/y-stage II	
	Localised	Stage III/y-stage III	
	Metastatic	Stage IV	
Rhabdomyosarcoma	Localised	TNM stage 1[27]	Rhabdomyosarcoma overall stage incorporates both TNM staging and site of disease; as registries collect primary disease site, overall rhabdomyosarcoma stage may be approximated with either tier staging system; for very high-resourced registries, a Tier 3 system that incorporates site of metastases could be considered
	Localised	TNM stage 2	
	Localised	TNM stage 3	
	Metastatic	TNM stage 4	
Non-rhabdomyosarcoma soft-tissue sarcomas	Localised	TNM stage 1[27]	..
	Localised	TNM stage 2	
	Localised	TNM stage 3	
	Metastatic	TNM stage 4	
Osteosarcoma	Localised	Localised	Although more detailed staging systems exist,[34] their clinical and prognostic value is limited; multi-tiered staging systems were not deemed appropriate; for very high-resourced registries, a Tier 3 system which incorporates site of metastases could be considered
	Metastatic	Metastatic	
Ewing's sarcoma	Localised	Localised	Although more detailed staging systems exist,[34] their clinical and prognostic value is limited; multi-tiered staging systems were not deemed appropriate; for very highly resourced registries, a Tier 3 system incorporating site of metastases may be considered
	Metastatic	Metastatic	

	Tier 1 staging system	Tier 2 staging system	Comments
Retinoblastoma	Localised (intraocular)	IRSS stage 0[35]	In keeping with current registry guidelines for retinoblastoma, in cases of bilateral disease the stage of the most advanced eye should be recorded; within IRSS stage 0, group A–E was considered Tier 3 recommendation
	Localised (intraocular)	IRSS stage I	
	Localised (intraocular)	IRSS stage II	
	Regional (orbital or regional lymph nodes)	IRSS stage III	
	Distant (extra-orbital)	IRSS stage IV	
Hepatoblastoma	Localised	Localised	Collection of PRETEXT is a Tier 3 option[36]
	Metastatic	Metastatic	
Testicular	Localised	TNM stage I[37]	Although the Tier 1 and Tier 2 staging systems correlate perfectly, the individual components of TNM staging would not be collected in the Tier 1 system
	Regional	TNM stage II	
	Metastatic	TNM stage III	
Ovarian	Localised	FIGO stage I[38]	..
	Regional	FIGO stage II	
	Regional	FIGO stage III	
	Metastatic	FIGO stage IV	

	Tier 1 staging system	Tier 2 staging system	Comments
Astrocytomas	None	None	No relevant staging system identified or necessary
Medulloblastoma and other CNS embryonal tumours	M0 or localised	M0[11]	Residual disease, defined as >1·5 cm^2 after resection, is an important non-stage prognostic factor and could be considered for collection by appropriately resourced registries[39,40]
	M+ or metastatic	M1	
	M+ or metastatic	M2	
	M+ or metastatic	M3	
	M+ or metastatic	M4	
Ependymoma	M0	M0	Extent of resection, defined as no resection *vs* subtotal *vs* gross total, is an important non-stage prognostic factor and might be considered for collection by appropriately resourced registries
	M+	M1	
	M+	M2	
	M+	M3	
	M+	M4	

Tiered staging systems for the main childhood cancers. AJCC=American Joint Committee on Cancer. COG=Children's Oncology Group. FIGO=International Federation of Gynaecological Oncologists. INRGSS=International Neuroblastoma Risk Group Staging System. IRSS=International Retinoblastoma Staging System. NWTSG=National Wilms Tumour Study Group. SIOP=International Society of Paediatric Oncology.

Table 3: **The Toronto Paediatric Cancer Stage guidelines**

- Exercises

- https://create.kahoot.it/share/childhood-cancer-exercises/56a220f7-8ddc-4c91-a55d-fa7e8bacdfac

Conclusions

- Recording stage in a cancer registry
  - Offers specific information for Public Health/ surveillance and oncology objectives
  - Needs validation and consistency checks
  - Invites to work on ‘comparability’
  - But also has to tackle difficulties... complexity, missing data, diagnostic precision differences, versions and updates...

TNM : a fascinating but never ending story…..