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Coding Primary Site and Tumor Morphology

ENCR-JRC training course

Ispra, 5-6 June 2019 Nadya Dimitrova



Outline

- What is coding and why do we need it?
- ICD-10 and ICD-0
- ICD-O-3 Topography coding rules
- ICD-O-3 Morphology coding rules
- How to code?
- ICD-O-3 online



What is coding and why do we need it?

Coding:

• to assign numerical codes to text descriptions

Example: Malignant neoplasm of the lung = C34

Advantages:

- group cases with similar concepts site of origin, type of cancer
- complex series of pieces of information can be:
 - conveyed,
 - stored and
 - retrieved in the form of numbers (quickly, easier)



Cancer registry data - example

Во вала искане 590915 Иза патохистологичнотизследане Изма патохистологичнотизследание общения болиция и востоиния и востоини	PIN	Incidence date	Site	Morphology and behavior	grade
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зылестлени лаборатории данни: Триложено лечение: Травено ли е преди това биопсично изслицане, къде кога, разултат.	1011030898	27102005	C64	83103	4
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ТЪТВАНЕ: За достоверна диагноза необходимо е материалът да се взема правилно ява или тумов зко с еми и не може да се изпратят целите, да се изреже от ръба със здрава околност, да се изпраща и по по се изпраща се изпратят целите, да се изреже от ръба със здрава околност, да се изпраща ратиен, биспентен з затериал само в една хистопатологична лабораторна. Фиксирациата течност да с и по те от обема на материала; най-добре се фиксира 10 % формалин (прозажният формалин е 40 % са	Ĵ				European Commission

What is coding and why do we need it?

Coding is based on **classification:**

 arrangement of neoplasms or distribution in classes according to a method or system, ensuring <u>comparability</u>.

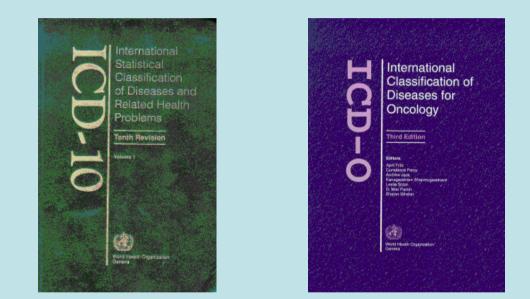
The two most important items of information are:

- Topography: the location (site) of the tumor in the body;
- **Morphology** (histology, cytology): the appearance of the tumor when examined under the microscope.



What is ICD-O?

- Subset of International Classification of Diseases
- Specific code set for neoplasms
- Coding system for primary site and cell type
 - *Example*: adenocarcinoma of lung = C34, 8140/3
- **ICD-O-3.2** version published in April 2019, to be used from 2020 - <u>http://www.iacr.com.fr</u>



Original - all diseases Subset - neoplasms only



Differences: Organization

- ICD-10 organized by
 - 1. Behavior
 - 2. Anatomic site involved
 - 3. Morphology codes optional
- ICD-O organized by
 - 1. Anatomical site involved
 - 2. Morphology + Behavior



ICD-10 and ICD-O-3

Term	ICD-10	ICD-O-3
Lung tumor, benign	D14.3	C34.9 8000/0
Lung tumor, borderline	D38.1	C34.9 8000/1
Lung tumor, in situ	D02.2	C34.9 8000/2
Lung tumor, invasive	C34.9	C34.9 8000/3
Lung tumor, metastatic	C78.0	C34.9 8000/6
Lung tumor, uncertain	D38.1	C34.9 8000/9
if primary or metastatic		

Differences: Codes

- Some special codes added in ICD-O
- Some ICD-10 codes not used
- Some codes used differently



ICD-0 Special Site Codes

C42 Hematopoietic and reticuloendothelial system

- C42.0 Blood
- C42.1 Bone marrow
- C42.2 Spleen
- C42.3 Reticuloendothelial system, NOS
- C42.4 Hematopoietic system, NOS
- Use as primary site for **leukemia** (C42.1), **multiple myeloma** (C42.1), **Waldenstrom macroglobulinemia** (C42.0)



ICD-10 **Codes Not Used in ICD-0** Histology-specific ICD-10 Codes

	ICD-10	ICD-O
C43	Melanoma of skin	C44
C45	Mesothelioma	C38.4*
C46	Kaposi's sarcoma	C44*
C81-C96	Lymphomas, leukemias, other blood diseases	C42.1*, C77.*
		* For most cases



Other ICD-10 Codes Not Used in ICD-O

	ICD-10	ICD-O
C26.1	Spleen	C42.2
C78-C79	Secondary malignant neoplasm of other specified sites	Code primary site (only) in ICD-O
C97	Malignant neoplasm of independent multiple primary sites	Code each primary separately

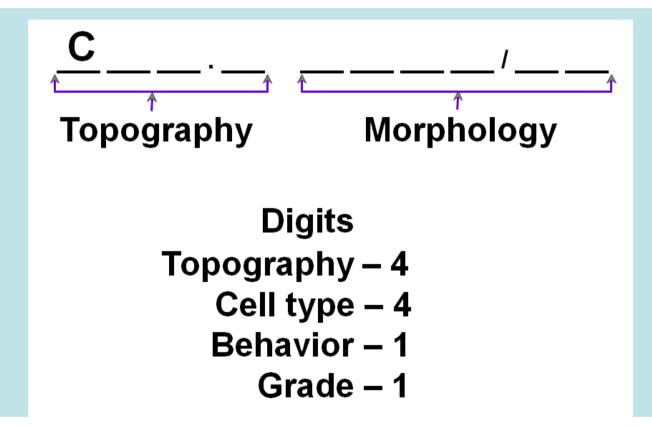


Site Codes Used **Differently**

	ICD-10	ICD-O
C77	Lymph nodes (primary and secondary)	Use C77 as primary site for nodal lymphomas . Do not code lymph node metastases as primary sites in ICD-O.



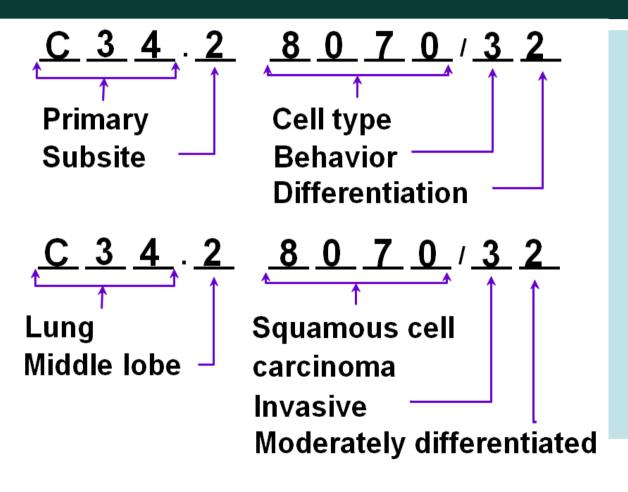
Structure of Code





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Meaning





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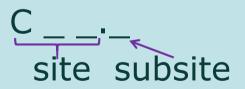
ICD-O-3 Topography Coding Rules



Coding topography using ICD-O-3

• The topography code:

- Indicates the **site of origin** of a neoplasm where the tumor arose.
- Has four-characters that run from C00.0 to C80.9
- A decimal point (.) separates subdivisions of the threecharacter categories



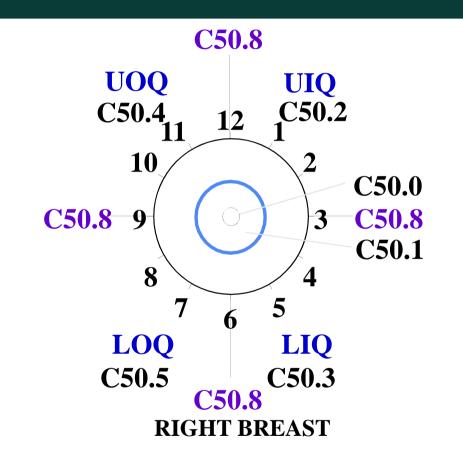




ICD-O topography codes - example

C50 BREAST (excludes skin of breast C44.5)

- C50.0 Nipple Areola
- C50.1 Central portion of breast
- C50.2 Upper-inner quadrant of breast
- C50.3 Lower-inner quadrant of breast
- C50.4 Upper-outer quadrant of breast
- C50.5 Lower-outer quadrant of breast
- C50.6 Axillary tail of breast Tail of breast, NOS
- C50.8 Overlapping lesion of breast (see section 4.2.6) Inner breast Lower breast Midline of breast Outer breast Upper breast
- C50.9 Breast, NOS Mammary gland





ICD-O topography codes - example

Large bowel, NOS

C18 COLON C18.0 Cecum Ileocecal valve C 18.4 Ileocecal junction Transverse colon Appendix C18.1 Ascending colon C18.2 Splenic flexure Right colon C 18.3 Hepatic flexure of colon C18.3 Hepatic flexure Transverse colon C18.4 Descending colon Splenic flexure of colon C18.5 C 18.2 Ascending colon Descending colon C18.6 Left colon Sigmoid colon C18.7 Sigmoid, NOS Sigmoid flexure of colon C 18.1 Pelvic colon Cecum Sigmoid colon C18.8 Overlapping lesion of colon C 18.0 (see section 4.2.6) Appendix C18.9 Colon, NOS Large intestine (excludes rectum, NOS C20.9 and recrectosigmoid junction C19.9)



C 18.5

C 18.6

C 18.7

Special topography codes

Divisions of the Esophagus – two incompatible systems and both are included.

- C15 Esophagus
- C15.0 Cervical esophagus
- C15.1 Thoracic esophagus
- C15.2 Abdominal esophagus
- C15.3 Upper third of esophagus
- C15.4 Middle third of esophagus
- C15.5 Lower third of esophagus
- C15.8 Overlapping lesion of esophagus
- C15.9 Esophagus, NOS





descriptors

radiographic and intraoperative



descriptors

ICD-O-3 Topography Coding Rules

- Rule A. Topographic regions and ill-defined sites
- Rule B. Prefixes
- Rule C. Tumors involving more than one topographic category or subcategory
- Rule D. Topography codes for lymphomas
- Rule E. Topography code for leukaemias



RUEA Topographic regions and ill-defined sites



Rule A Topographic Regions and Ill-defined Sites

"If the diagnosis does not specify the **tissue of origin**, code the **appropriate tissues** suggested in the **alphabetic index** for each **ill-defined site** in preference to the "**NOS**" category."

Ill-defined site: term for area of the body used in a **general sense** - arm, ankle, face

- **NOS:** Not otherwise specified
 - Not elsewhere classified
 - Term used in a general sense
 - When there are more specific codes
 - To encompass an organ as a whole



Rule A

Topographic Regions and Ill-defined Sites

- Example: Osteosarcoma of ankle
- Issue: Primary site not fully identified in diagnosis
- Several non-specific codes available in the **alphabetic index**
 - C76.5 **Ankle**, NOS
 - C40.3 Bone of **ankle**
 - C44.7 Melanoma of **ankle**
 - C49.2 Soft tissue of **ankle**
- Use information from the cell type to code primary site.
 - Osteo sarcoma of ankle
 - Code: C40.3 bone of ankle



Rule A Topographic Regions and Ill-defined Sites

Implied rule:

- Code as specifically as you can with the information you have
- Avoid using ill-defined site codes if possible.



RUE B Prefixes



Rule B. Prefixes

- "If a topographic site is modified by a prefix such as peripara-, or the like which is not specifically listed in ICD-O, code to the appropriate ill-defined subcategory C76, unless the type of tumour indicates origin from a particular tissue".
- Prefix terms in ICD-O index:

Term	ICD-O code
Periampullary	C24.1
Periadrenal or perirenal	C48.0
Retrocecal or peripancreatic	C48.0
Supratentorial brain	C71.0



Rule B. Prefixes

- When term is not listed, determine the location it describes and code that.
- Examples

Paraspinal—along the spine: C76.7 Ill-defined site of back Perigastric—near the stomach: C76.2 Ill-defined site of abdomen Peribiliary—near the biliary tract: C76.2 Ill-defined site of abdomen



Rule B. Prefixes

- Implied rule: When you can't find a code for the anatomic site term in the alphabetic index, use "ill-defined site of ..." C76._
- Do not code to primary site mentioned (such as spine, stomach, bile duct) when tumor is described as "near" that organ.



RUEC Tumors involving more than one topographic category or subcategory



Rule C. Tumors Involving More Than One Topographic Category or Subcategory

- "Use **subcategory** ".8" when a tumor overlaps the boundaries of two or more categories or subcategories and its point of origin cannot be determined."
- Implied rule: If you can't tell where a single tumor started in an organ or system, use an "overlapping site code, C___.8.

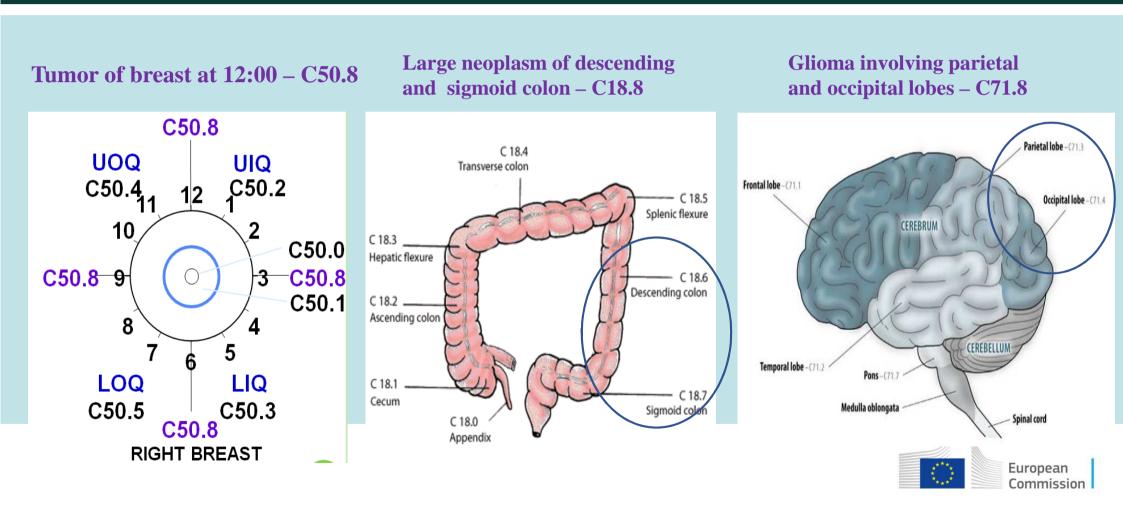


Rule C. Overlapping Sites - examples

Overlapping lesion of	ICD-O code
Tongue	C02.8
Major salivary glands	C08.8
Lip, oral cavity and pharynx	C14.8
Rectum, anus and anal canal	C21.8
Biliary tract	C24.8
Digestive system	C26.8
Female genital organs	C57.8
Male genital organs	C63.8



Rule C. Overlapping Sites - examples



Rule C. Overlapping Sites

Does not apply to non-adjacent sites

- *Example*: Squamous cell carcinoma of skin of forehead and skin of forearm
 - Primary site: C44.9 Skin, NOS Forearm and forehead are not adjacent sites.
- Does not apply to separate lesions
 - Example: Separate tumors in UIQ and LOQ of breast
 - Primary site: C50.9 Breast, NOS (or according to the rules for multiple primaries)



RUE D Topography codes for lymphomas



Rule D. Topography Codes for Lymphomas

Lymphomas arising in lymph nodes	Extranodal lymphomas
Code C77. _	Code to the site of origin , which may not be the site of the biopsy.
If multiple lymph node regions are involved, code to C77.8 (lymph nodes of multiple regions).	If no site is indicated for a lymphoma and it is suspected to be extranodal, code to C80.9 (unknown primary site).
If no site is indicated for a [nodal] lymphoma, code to C77.9 (lymph node, NOS).	



Rule D. Topography Codes for Lymphomas

Implied rule: Code a lymphoma to its site of origin. *Examples*:

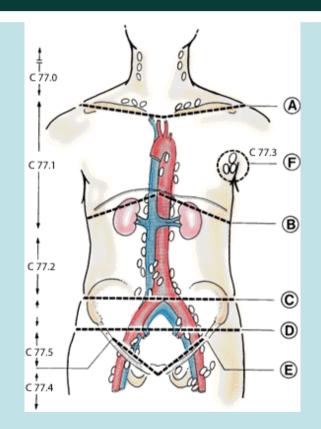
- Hodgkin lymphoma of cervical lymph nodes \rightarrow C77.0
- MALT lymphoma of stomach → C16.9
- B-cell lymphoma of inguinal and femoral nodes → C77.4
- Primary lymphoma of femur → C40.2



Rule D. Topography Codes for Lymphomas

C77.8 Special Rule: Involved lymph node chains do not have to be adjacent.

Examples: Cervical and mediastinal nodes \rightarrow C77.8 Axillary and periaortic nodes \rightarrow C77.8





RUE E Topography code for leukaemias



Rule E. Topography Code for Leukemias

"Code all leukaemias except myeloid sarcoma (M-9903/3) to C42.1, bone marrow."

- Myeloid sarcoma: a deposit of malignant myeloid cells in soft tissue. Code to location of lesion.
- The following are also coded to bone marrow, C42.1
 - Multiple myeloma
 - Refractory anemias
 - Polycythemia vera
 - Myelodysplastic syndrome
 - Other hematopoietic diseases



ICD-O-3 Morphology Coding Rules



ICD-O-3 Morphology Coding Rules

- Rule F. Behavior code in morphology
- Rule G. Grading or differentiation code
- Rule H. Site-associated morphology terms
- Rule J. Compound morphology diagnoses
- Rule K. Coding multiple morphology terms

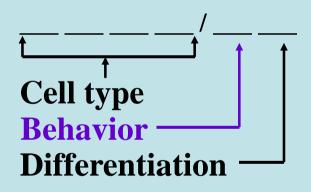
Note: **ICD-O-3.2** includes about 100 new terms, some of them with new codes



RUE F Behavior code in morphology



 "Use the appropriate 5th digit behavior code even if the exact term is not listed in ICD-O."





- Behavior of a tumor is the way it acts within the body
- Codes:
 - /0 benign the tumor grows in place without the potential for spread;
 - **/1** uncertain whether benign or malignant
 - /2 noninvasive or in situ the tumor is malignant, but still growing in place
 - **/3** malignant, primary site the tumor invades surrounding tissues
 - /6* malignant, metastatic site the tumor disseminates from its point of origin and begin to grow at another site
 - **/9*** malignant, uncertain whether primary or metastatic site
 - * Not used by cancer registries, but by pathologists



The Matrix principle

- 8010/0 Epithelial tumor, benign
- 8010/1* Borderline epithelial tumor
- 8010/2 Intraepithelial carcinoma, NOS
- 8010/3 Epithelial tumor, malignant (Carcinoma, NOS)
- 8010/6 Metastatic carcinoma
- 8010/9 Carcinomatosis
- * 8010/1 is not printed in ICD-O-3, but can be constructed if the pathologist diagnoses a borderline epithelial tumor.



Implied rule: It is OK to change the behavior code to accurately report what the pathologist said.

Example:

 Pathology report states "adenoid squamous cell carcinoma *in situ"* ICD-O-3 only lists 8075/3 Adenoid squamous cell carcinoma.
Change behavior code to 8075/2 to indicate in situ.



• ICD-0-3.2

- About 65 changes (or new) of behavior code
- May impact on the definition of a reportable case
- Examples:

Change of behavior code (from 1)	8150	3 Pancreatic endocrine tumor, NOS (C25.4)
Change of behavior code (from 1)	8580	3 Thymoma, NOS (C37.9)
Change of code and behavior (was 8508/3)	8500	2 Cystic hypersecretory carcinoma (C50)
Change of behavior code (from 3)	8832	1 Dermatofibrosarcoma, NOS (C44.)



Note: Most cancer registries collect only

- /2 Carcinoma in situ; noninvasive; noninfiltrating; intraepithelial
- /3 Malignant, primary site (invasive)
- If diagnosis comes from a metastatic site, the cancer registry records primary site and morphology with behavior /3.

Example: Pathology report says: "metastatic adenocarcinoma in lung biopsy." Coded as C34.9 8140/6 on report.

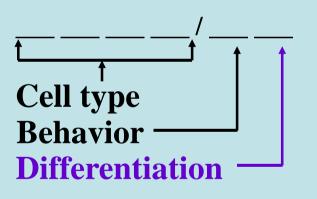
Cancer registry reports case as unknown primary site, C80.9 8140/3



RULE G Grading or differentiation code



 "Assign the highest grade or differentiation code described in the diagnostic statement."





Histologic grading and differentiation for malignant tumors – describes how much or how little a tumor resembles the normal tissue from which it arose (**codes 1 to 4** and 9).

Codes:

- 1 Grade I, well differentiated
- 2 Grade II, moderately differentiated
- **3** Grade III, poorly differentiated
- **4** Grade IV, undifferentiated, anaplastic
- **9** grade, differentiation or cell type not determined, not stated or not applicable



 Cell origin/lineage for leukemias and lymphomas (codes 5 to 8 and 9)

Codes:

- **5** T-cell
- 6 B-cell
- 7 Null cell, Non T-non B
- 8 NK cell
- **9** grade, differentiation or cell type not determined, not stated or not applicable



Implied rule: Code to the **higher grade**. *Example:* moderately to poorly differentiated adenocarcinoma of prostate

- Moderately differentiated = grade 2
- Poorly differentiated = grade 3
- Code diagnosis as 8140/33



• Implied rule: "double code" any statement of grade in the diagnostic term.

Example: undifferentiated carcinoma

- Undifferentiated carcinoma = 8020/3
- Undifferentiated = 4
- Code diagnosis as 8020/34



Central Nervous System tumours follow a slightly different system (table 27 in ICD-O)

WHO Grade I (benign or borderline malignant)

WHO Grade II ('low grade')

WHO Grade III (`anaplastic')

WHO Grade IV

Examples:

oligodendroglioma, NOS \rightarrow 9450/32 anaplastic astrocytoma \rightarrow 9401/33 glioblastoma \rightarrow 9440/34



Implied rule: For **haematological malignancies** use **cell origin**, not the differentiation (grade), if both are stated.

Example:

 Poorly differentiated B-cell nodular lymphocytic lymphoma Poorly differentiated = grade 3 B-cell origin = code 6 Code diagnosis as 9693/36



RUEH Site-associated Morphology Terms



Rule H. Site-associated Morphology Terms

"Use the topography code provided when a topographic site is not stated in the diagnosis.

This topography code should be disregarded if the tumor is known to arise at another site."

Suggested site code

- In parenthesis () after morphology term
- Most common site associated with neoplasm

Examples:

M-8330/3 Adenocarcinoma, follicular (C73.9 {thyroid})

M-9700/3 Mycosis fungoides (C44._ {skin})



Rule H. Site-associated Morphology Terms

Examples of terms that include a root word mentioning a site

- Nephroblastoma, NOS (C64.9 kidney)
- Thymoma, NOS (C37.9 thymus)
- Bronchiolar carcinoma (C34._ bronchioles of lung)
- Hepatocellular carcinoma (C22.0 liver)

No suggested site code is listed when malignancy could appear in many sites, such as adenocarcinoma, NOS



Rule H. Site-associated Morphology Terms

If a site is given that is different from the site indicated by the suggested site code, use the site code appropriate to the diagnosis.

- *Example*: infiltrating duct carcinoma, head of pancreas
 - 8500/3 Infiltrating duct carcinoma (C50._) *Suggested site code is* breast—ignore this based on diagnosis!
 - Head of pancreas = C25.0
 - Code diagnosis as C25.0 8500/3

Implied rule: Use the suggested site code as a guide to code the primary site. If the site stated in the pathology report is different, code what the pathology report states (note: metastatic site).

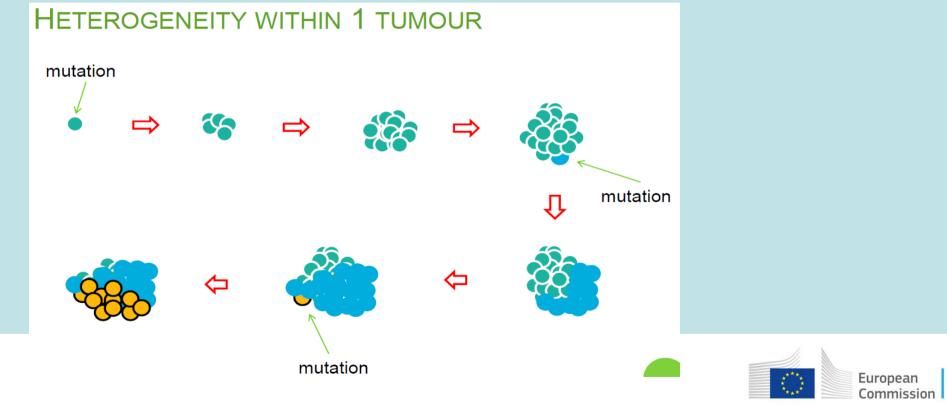


RUEJ Compound Morphology Diagnoses



Rule J. Compound Morphology Diagnoses

"Change the order of word roots in a **compound term** if the term is not listed in ICD-O-3."



Rule J. Compound Morphology Diagnoses

Compound terms have **multiple root words** *Example:*

 Myxofibrosarcoma – not in ICD-O-3.1 (added to ICD-O-3.2) Break into word roots Myxo / fibro / sarcoma Change around word roots, then look up new term Fibromyxosarcoma 8811/3

Chondro-osteosarcoma →

Osteochondrosarcoma 9180/3



RUE K Coding Multiple Morphology Terms



Rule K. Coding Multiple Morphology Terms

"When no single code includes all diagnostic terms, use the **numerically higher** code number if the diagnosis of a single tumor includes two modifying adjectives with different code numbers."

Implied rule: Code to higher code number if there is no combination code.

For haematological malignancies - code **the most specific code** (not necessarily the highest code), take into account specific diagnostics, such as immunohistochemistry and cytogenetics.



Rule K. Coding Multiple Morphology Terms

Examples:

"Adenoid cystic spindle cell carcinoma"

No combination code Spindle cell carcinoma 8032/3 Adenoid cystic carcinoma 8200/3 Code morphology to higher number 8200/3

"Papillary and tubular adenocarcinoma" Papillary adenocarcinoma 8260/3 Tubular adenocarcinoma 8211/3 There is a singe code: 8255/3 (Adenocarcinoma with mixed subtypes)



Rule K. Coding Multiple Morphology Terms

Look for a code that represents the combined morphology:

Mixed embryonal carcinoma and teratoma = teratocarcinoma 9081/3 Ductal carcinoma and lobular carcinoma 8522/3

Compound terms

Carcinosarcoma 8980/3 Adenocarcinoma and squamous carcinoma = adenosquamous

carcinoma 8560/3

Small cell-large cell carcinoma 8045/3



How to Code

- Break phrase into topography and morphology
- Look up morphology first
- Use up all the words in the phrase
- Add 5th and 6th digit codes
- Look up topography



Coding example 1

Diagnosis: Poorly differentiated hepato-cellular carcinoma of right lobe of liver

- What is it (morphology and behavior)? Hepatocellular carcinoma, NOS (C22.0): 8170/3
- Suggested site code is included in index Liver, right lobe: C22.0 Liver, NOS
- What else do we know? Poorly differentiated: /_3
- Complete codes: C22.0 8170/33



Coding example 2

Diagnosis: Moderately differentiated adenocarcinoma of prostate

- What is it (morphology and behaviour)? Adenocarcinoma [not otherwise specified]: 8140/3
- What else do we know? Moderately differentiated: /_2
- Where did it start (topography)? Prostate: C61.9
- Complete codes: C61.9 8140/32



ICD-O-3 online: codes.iarc.fr

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ABOUT ICD-O	USING ICD-O-3 ONLINE	MORPHOLOGICAL CODES	TOPOGR	APHICAL CODES	WHO CLASSIFICATION OF TUMOURS OF THE DIGESTIVE SYSTEM ¹
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ABOUT ICD-0	USING ICD-O-3 ONLINE	MORPHOLOGICAL CODES	TOPOGRAPH	ICAL CODES	8480/3 Mucinous adenocarcinoma 8480/3 Pseudomyxoma peritonei with unknown primary site 8355/3 Adopasarcinoma with mixed subtrans
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9591/3 Malignant lymphoma, non-cleaved cell, NOS 9591/3 B cell lymphoma, NOS 9591/3 Malignant lymphoma, non-Hodgkin, NOS



