ENCR Recommendations 2025

Treatment Data Recording (phase I)

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Contents

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Background

In Europe, many population-based cancer registries are collecting, routinely or for some specific projects, data related to cancer stage and treatment. Routine collection of clinical data is possible for registries, for example by active registration method when registering a new cancer and/or by linking incident cases with external information sources, such as hospital discharge and outpatient records, health insurance reimbursement data or drug prescriptions[1]. Despite the fact that the collection of cancer stage at diagnosis is well defined, the principles of collecting data on treatment are not standardised at the European level.

This data allows the:

- Monitoring of treatment patterns;
- Assessment of the compliance with clinical guidelines;
- Evaluation of new treatments at population level
- Identification of inequalities in health service access

In order to use treatment data it is essential to ensure their comparability at a European level. This requires harmonisation of variables across European population-based cancer registries. The ability to analyse such data is of particular interest for every individual country/region as well as for the European Commission initiatives to reduce cancer mortality and improve patient outcomes. Cancer diagnosis, stage at diagnosis and treatment are some of the key pillars of the Commission Europe's Beating Cancer Plan, which aims to provide better integrated and comprehensive cancer care and to evaluate accessibility to quality care and medicines[2].

In this context, the European Network of Cancer Registries (ENCR) Steering Committee and the European Commission's Joint Research Centre (JRC) set up in June 2021 the Working Group on Treatment Data Harmonisation in order to recommend collection of treatment data and to reflect on guidelines for the harmonisation of treatment variables in European population-based cancer registries.

[1] Giusti (2023), De Angelis (2019), Siesling (2015), Coebergh (2012), Gatta (2010).
[2] European Commission (2021).

Aims of the Recommendation

The aim of the present document is to provide the first recommendations for treatment data collection and coding to the population-based cancer registries, in order to improve data harmonisation and comparability in Europe.

Specific objectives of the present document are to:

- Formulate a clear recommendation for cancer registries to collect data on treatment
- Formulate a clear general definition of treatment, by type (e.g. surgery, radiotherapy and systemic therapies)

These recommendations have been built in alignment with the latest *Call for Data protocol for European Population-Based cancer registries* and offer a guidance for interpretation of the data protocol specifically regarding treatment-related information.
The recommendations are to be seen additionally to recommendations non related to treatment such as incidence date, basis of diagnosis, standard dataset, TNM classification and others.
The present recommendations focus on first course active anticancer treatments: these tumour-reductive treatments need to be taken into account for delineation of cancer recurrence and progression as is described in the respective recommendations (see ENCR Recommendations | European Network of Cancer Registries).

Entering into Force

The new ENCR Recommendations on Treatment Data Recording (phase one) is published on the website on 27 January 2025. These recommendations should be applied to all tumours with an incidence date as of 1-1-2025, but may also be applied to earlier dates.

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Defining Treatment and Types of Treatments

For the purpose of the present recommendations, anticancer treatment is defined as **first course** procedures (i.e. first line treatment modalities).
This definition excludes:

- diagnostic procedures,
- interventions that have a supportive or symptomatic intent[3],
- second line (disease progression) and further courses of therapy (e.g. interventions for recurrence after disease free interval).

Treatment information must thus be limited to active anticancer treatment administered as a primary approach, which may include a combination of multiple treatment modalities. For some cancer registries, distinguishing this primary approach from treatments given thereafter (e.g. for disease progression or recurrence) may be not possible: these registries are encouraged to report on all treatments started within 9 months following diagnosis.

A *multi-tiered* system approach has been defined by the Working Group on Treatment Data Harmonisation for each type of treatment to meet the differences in resources engaged in data collection process between European CR's and their possibility to collect detailed data.
Tier 1 consists in the minimum required information, whereas *tier 2 (and above)* include more detailed information, to be used for instance for the evaluation of clinical guidelines. Such detailed information covers for example specific surgical procedures, site/fractions/technique/dose of radiotherapy, specific type of targeted therapy,…

The present recommendations introduce the first phase of this approach, and give guidance on tier 1 treatment data recording. This document will be followed in a second phase by guidelines on the collection of more detailed treatment information (*tier 2 and above*), for different cancer entities.

Following the latest *Call for Data protocol for European Population-Based cancer registries*[4], organised by the JRC and the ENCR, treatment types (modalities) are divided between:

- **surgery**,
- **radiotherapy,**
- **systemic therapies** (chemotherapy, targeted therapy (including monoclonal antibodies), immunotherapy (excluding monoclonal antibodies), hormone therapy, unspecified[5]).

[3] In case of doubts on the intent of the first course intervention it is recommended to record treatment data anyhow
[4] https://www.encr.eu/sites/default/files/Data_call/ECIS%20call%20for%20data%20protocol_20221124.pdf
[5] The 'unspecified' category aims to capture 1) systemic treatment for those cancer registries that are not able to distinguish between systemic therapy subtypes; and 2) all treatments that clearly exert systemic active anti-cancer effects but don't fit in the other systemic treatment subtypes

Common current sources of information for these treatment modalities are described in each respective section. Given rapid evolutions, these sources, including used data standards, are expected to be extended over time (e.g. European Electronic Health Record Exchange Format (EEHRxF)[6], SNOMED-CT[7], …).

Besides the three main treatment types, these recommendations also cover stem cell transplantations and reasons for no treatment.

[6] Commission recommendation on a European Electronic Health Record exchange format (C(2019)800) of 6 February 2019.
[7] SNOMED-CT international, www.snomed.org.

1. SURGERY

Surgery covers procedures with a tumour-reductive intent.

Following the latest *Call for Data protocol for European Population-Based Cancer Registries*, a distinction is made between 'minimal surgery' and 'extensive surgery'.

'Minimal surgery' concerns procedures that are minimally invasive and leave the organ of origin in situ. These procedures include polypectomy (mainly gastrointestinal tract), transurethral resection (TUR; bladder and other urinary tract), cone biopsy/loop excision (cervix), as well as all other procedures which leave the organ in situ, such as cryosurgery, laser coagulation, thermoablation including radiofrequency ablation (RFA) and microwave ablation (MWA), photodynamic therapy.

'Extensive surgery' includes all resections of the tumour which require at least the removal of the organ of cancer origin or a part of that organ, such as a lobectomy, hemicolectomy, hysterectomy, cystectomy, prostatectomy, etc. Surgeries that include removal of additional structures besides the primary organ of origin (e.g. lymph nodes, adjacent organs), are also considered as 'extensive surgery'. Exceptionally, a resection of lymph nodes may occur without removal of the primary tumour (e.g. neck dissection for head and neck squamous cell carcinoma of unknown primary origin): this should also be considered as 'extensive surgery'. This is not the case for lymph node dissections purely performed as a staging procedure and not as a therapeutic procedure

In case both minimal and extensive surgery are performed as part of the primary treatment approach for the same tumour (e.g. polypectomy for colorectal cancer followed by a partial colectomy), the extensive surgery prevails over the minimal surgery.

Surgery for oligometastatic disease (i.e. a limited number of treatable metastases at time of primary diagnosis) can be recorded if it is part of the primary treatment approach. Such surgery can be accompanied by surgery for the primary tumour, and will then together be recorded as extensive surgery. If the surgery for oligometastatic disease occurs in the absence of other extensive surgery, it can on itself be considered as extensive surgery[8].

Of note, surgery also includes procedures with an originally different intent that later onwards appear to be therapeutic (e.g. breast reduction surgery leading to a breast cancer diagnosis), or a procedure performed for both diagnostic and therapeutic purposes (e.g.cystoprostatectomy for bladder cancer with coincident finding of prostate cancer).

[8] Specific information on surgery for oligometastatic disease may be available for some registries but can be considered too detailed for this Tier 1 data collection. At the same time, such surgery can be considered complex and is mostly accompanied by substantial treatment procedures, either surgical or other. This justifies the classification of surgery for oligometastatic disease as 'extensive surgery'.

Possible information sources:

- hospital discharge records (including statutory reports from hospitals) are one of the main surgery data sources in Europe for cancer registries. Some of the most commonly used classification are, ICD-9-CM[9], ICD-10-PCS[10], ICHI[11], OPCS-4[12], OPS[13], or modifications of these systems (e.g. the Swiss CHOP classification[14]),
- another frequently used source of surgery data are clinical records (including interdisciplinary tumour boards reports), which are currently *electronic health records* in many European Union member states[15]. Such clinical records may be available for inpatient and outpatient hospital care, and for private practices. All of these are potentially relevant,
- pathology reports and
- insurance reimbursement claims/data.

The information (*tier 1*) to be collected for all cancer entities is described in **Table 1**.

If date of surgery is available, it should be collected and recorded (in case of multiple applicable extensive surgeries, the date of surgery for the primary tumour should be recorded). Additional variables include information on the hospital of surgery. This could be important for the assessment of centralisation level and accessibility, and for monitoring the efficiency and effectiveness of the health system in cancer treatment.

[9] International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), Volume 3.

[10] International Classification of Diseases, Tenth Revision Procedure Coding System

[11] International Classification of Health Interventions (https://www.who.int/standards/classifications/international-classification-of-health-interventions)

[12] OPCS Classification of Interventions and Procedures Fourth Revision. NHS England 2022.

[13] German procedure classification (Operationen- und Prozedurenschlüssel - OPS), Federal Institute for Drugs and Medical Devices 2023.

[14] Swiss classification of operations (CHOP), Swiss Federal Statistical Office 2020.

[15] Milieu Ltd, Time.lex. Overview of the national laws on electronic health records in the EU member states and their interaction with the provision of cross-border eHealth services. Brussels, Consumers, health and food executive agency (Chafea), 2014.

Table 1. *Surgery (all cancer entities): variables description, format, missing/unknown values and coding schema.*

Variable description	Format	Missing/ unknown	Coding
Surgery	F	9*	0→No 1→Yes, not specified 2→Yes, minimal surgery only 3→Yes, extensive surgery
Day of surgery	F	99	Range of allowed values: From 1 to 31
Month of surgery	F	99	Range of allowed values: From 1 to 12
Year of surgery	F	9999	≥ Year of incidence
Hospital of surgery	A	9	National coding system

F: Numeric variable A: Alphanumeric variable

* Registries that can't distinguish between the category 'missing/unknown' and 'no' (surgery), are advised to report 'no' (surgery), and mention their incapacity to make this distinction in a separate remark

2. RADIOTHERAPY

Radiotherapy, including more innovative approaches such as proton therapy, is defined for the present purpose as the use of radiation in a radical approach of destroying and/or shrinking tumours. It can be delivered either from external sources (external beam radiotherapy), internal sources (brachytherapy) or by administering radionuclides. It can be given as the only treatment, used before surgery to shrink the tumour (neoadjuvant radiotherapy), given during (intra-operative radiotherapy) or after surgery (adjuvant radiotherapy) to reduce the risk of recurrence. In addition, radiotherapy can also be used along with systemic cancer treatment, concurrently or sequentially. Radiotherapy for oligometastatic disease at diagnosis (i.e. a limited number of treatable metastases at time of primary diagnosis[16]) should also be collected.

Possible information sources

- Hospital discharge and, increasingly, outpatient records are important data sources in Europe for cancer registries. Some of the used classifications, like ICD-9-CM and ICD-10, have very limited information on type of radiotherapy.
- Another main source are specific radiotherapy information systems and datasets (e.g. the National Radiotherapy Dataset in England[17])
- Information on radiotherapy could be derived from hospital records (inpatient and outpatient hospital care, including interdisciplinary tumour boards reports) and private medical practices.
- Other sources of information are notifications of cancers and insurance reimbursement claims/data.
- Pathology reports could mention neo-adjuvant or intraoperative radiotherapy.

The information to be collected on radiotherapy is described in **Table 2**. If date of start and stop are available they should be collected, and if also date of surgery is available the setting (e.g. neoadjuvant) can be derived from this. As an alternative, information on the order should be registered.

Additional variables include information on the centre of radiotherapy. This could be important for monitoring, for instance, outcome in relation to centre characteristics.

[16] See for instance the definition of oligometastatic disease in colorectal cancer in the *ESMO consensus guidelines for the management of patients with metastatic colorectal cancer.* [17] Radiotherapy Data Set (RTDS) User Guide. Public Health England 2021.

[17] Radiotherapy Data Set (RTDS) User Guide. Public Health England 2021.

Table 2. *Radiotherapy (all cancer entities): variables description, format, missing/unknown values and coding schema.*

Variable description	Format	Missing/ unknown	Coding
Radiotherapy	F	9*	0 → No 1 → Yes
Radiotherapy in relation to surgery	F	9	1 → Radiotherapy without surgery 2 → Neoadjuvant (pre-operative) radiotherapy 3 → Adjuvant (post-operative) radiotherapy 4 → Combination of neoadjuvant and adjuvant radiotherapy 5 → Other relation with surgery (e.g. intra-operative)
Radiotherapy in relation to systemic therapy**	F	9	1 → Radiotherapy without systemic therapy 2 → Concurrent with systemic therapy 3 → Sequential to systemic therapy
Day of radiotherapy start***	F	99	Range of allowed values: From 1 to 31
Month of radiotherapy start	F	99	Range of allowed values: From 1 to 12
Year of radiotherapy start	F	9999	≥ Year of incidence
Day of radiotherapy stop	F	99	Range of allowed values: From 1 to 31
Month of radiotherapy stop	F	99	Range of allowed values: From 1 to 12
Year of radiotherapy stop	F	9999	≥ Year of incidence
Radiotherapy centre	A	9	National coding system

F: Numeric variable A: Alphanumeric variable

* Registries that can't distinguish between 'missing/unknown' or 'no' (radiotherapy), are advised to report 'no' (radiotherapy), and mention their incapacity to make this distinction in a separate remark.

**not applicable for hormonal therapy

*** in case of multiple radiotherapy series as part of the first line treatment, the recorded start and end dates are limited to the first series

3. SYSTEMIC THERAPY

In line with the latest *Call for Data protocol for European population-based cancer registries*, systemic therapies are categorised as:

- chemotherapy,
- targeted therapy, including monoclonal antibodies,
- immunotherapy, excluding monoclonal antibodies,
- hormone therapy[18],
- unspecified systemic therapy (limited to products with active anti-cancer action, see exclusion criteria mentioned above).

Targeted therapy comprises all drugs that block the growth of cancer cells by inhibition of certain pathways in the cancer cell. Traditional chemotherapy also affects other cells in the body that divide quickly. The main categories of targeted therapy are small molecules (mostly tyrosine kinase inhibitors such as imatinib and many other -*nibs*) and monoclonal antibodies (such as rituximab and many other -*mabs*).

As stated earlier, treatment information must be limited to active anticancer treatment administered as a primary approach. For systemic therapy, this may include systemic therapy given solely, in combination with radiotherapy (see above), or in combination with surgery (neo-adjuvant and/or adjuvant). Treatments given in case of progression or relapse after first line treatment must not be reported.

Possible information sources

- Hospital discharge and, increasingly, outpatient records are important data sources in Europe for cancer registries. Some of the used classifications, like ICD-9-CM and ICD-10, can only report if therapy was received or not.
- One of the main sources are hospital drugs databases and pharmaceutical prescription and/or dispensing databases.
- Information on systemic therapy could be derived from clinical records (inpatient and outpatient hospital care, including interdisciplinary tumour boards reports) and private medical practices.
- Other sources of information are notifications and insurance reimbursement claims/data.
- Pathology reports could mention neoadjuvant systemic therapy.

The information to be collected on systemic therapy is described in **Table 3**. If date of start and stop are available they should be collected, and if also date of surgery is available the timing (e.g. neoadjuvant) can be derived from this.

[18] Orchidectomy and oophorectomy (respectively performed to help control the growth of prostate cancer and breast cancer) should be coded as hormone therapy.

In case both neoadjuvant and adjuvant systemic therapy are given, they should be recorded separately, according to Table 3 below. In case it is not specified whether systemic therapy is neoadjuvant or adjuvant, or it is the only recorded treatment, then value "1" should be selected for variable "Systemic therapy", and dates and type of therapy should be recorded using variables "Day of systemic therapy start (adjuvant or unspecified)" and following. This counts for all types of systemic therapy (chemotherapy, targeted therapy, immunotherapy, hormone therapy, unspecified systemic therapy).

Additional variables include information on the centre of delivery of systemic therapy. Even though more and more patients receive systemic therapy outside the care centre, this could be important for monitoring, for instance, outcome in relation to centre characteristics.

An illustrative, non-exhaustive list of systemic therapy codes by type, according to the Anatomical Therapeutic Chemical (ATC) Classification System, with generic and trade names is reported in **Appendix 2**.

Table 3. *Systemic therapy variables description, format, missing/unknown values and coding schema.*

Variable description	Format	Missing/ unknown	Coding
Chemotherapy	F	9*	0 → No 1 → Yes, without other specification 2 → Yes, neoadjuvant (pre-operative) 3 → Yes, adjuvant (post-operative) 4 → Yes, both neoadjuvant and adjuvant
Day of chemotherapy start (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 31
Month of chemotherapy start (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 12
Year of chemotherapy start (adjuvant or unspecified)	F	9999	≥ Year of incidence
Day of chemotherapy end (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 31
Month of chemotherapy end (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 12
Year of chemotherapy end (adjuvant or unspecified)	F	9999	≥ Year of incidence
Chemotherapy centre (adjuvant or unspecified)	A	9	National coding system
Day of chemotherapy start (neoadjuvant)	F	99	Range of allowed values: From 1 to 31
Month of chemotherapy start (neoadjuvant)	F	99	Range of allowed values: From 1 to 12
Year of chemotherapy start (neoadjuvant)	F	9999	≥ Year of incidence
Day of chemotherapy end (neoadjuvant)	F	99	Range of allowed values: From 1 to 31
Month of chemotherapy end (neoadjuvant)	F	99	Range of allowed values: From 1 to 12
Year of chemotherapy end (neoadjuvant)	F	9999	≥ Year of incidence
Chemotherapy centre (neoadjuvant)	A	9	National coding system

Table 3. Cont.

Variable description	Format	Missing/ unknown	Coding
Targeted therapy	F	9*	0 → No 1 → Yes, without other specification 2 → Yes, neoadjuvant (pre-operative) 3 → Yes, adjuvant (post-operative) 4 → Yes, both neoadjuvant and adjuvant
Day of targeted therapy start (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 31
Month of targeted therapy start (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 12
Year of targeted therapy start (adjuvant or unspecified)	F	9999	≥ Year of incidence
Day of targeted therapy end (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 31
Month of targeted therapy end (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 12
Year of targeted therapy end (adjuvant or unspecified)	F	9999	≥ Year of incidence
Targeted therapy centre (adjuvant or unspecified)	A	9	National coding system
Day of targeted therapy start (neoadjuvant)	F	99	Range of allowed values: From 1 to 31
Month of targeted therapy start (neoadjuvant)	F	99	Range of allowed values: From 1 to 12
Year of targeted therapy start (neoadjuvant)	F	9999	≥ Year of incidence
Day of targeted therapy end (neoadjuvant)	F	99	Range of allowed values: From 1 to 31
Month of targeted therapy end (neoadjuvant)	F	99	Range of allowed values: From 1 to 12
Year of targeted therapy end (neoadjuvant)	F	9999	≥ Year of incidence
Targeted therapy centre (neoadjuvant)	A	9	National coding system
Immunotherapy	F	9*	0 → No 1 → Yes, without other specification 2 → Yes, neoadjuvant (pre-operative) 3 → Yes, adjuvant (post-operative) 4 → Yes, both neoadjuvant and adjuvant
Day of immunotherapy start (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 31
Month of immunotherapy start (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 12
Year of immunotherapy start (adjuvant or unspecified)	F	9999	≥ Year of incidence
Day of immunotherapy end (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 31

Table 3. Cont.

Variable description	Format	Missing/ unknown	Coding
Month of immunotherapy end (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 12
Year of immunotherapy end (adjuvant or unspecified)	F	9999	≥ Year of incidence
Immunotherapy centre (adjuvant or unspecified)	A	9	National coding system
Day of immunotherapy start (neoadjuvant)	F	99	Range of allowed values: From 1 to 31
Month of immunotherapy start (neoadjuvant)	F	99	Range of allowed values: From 1 to 12
Year of immunotherapy start (neoadjuvant)	F	9999	≥ Year of incidence
Day of immunotherapy end (neoadjuvant)	F	99	Range of allowed values: From 1 to 31
Month of immunotherapy end (neoadjuvant)	F	99	Range of allowed values: From 1 to 12
Year of immunotherapy end (neoadjuvant)	F	9999	≥ Year of incidence
Immunotherapy centre (neoadjuvant)	A	9	National coding system
Hormonal therapy	F	9*	0 → No 1 → Yes, without other specification 2 → Yes, neoadjuvant (pre-operative) 3 → Yes, adjuvant (post-operative) 4 → Yes, both neoadjuvant and adjuvant
Day of hormonal therapy start (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 31
Month of hormonal therapy start (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 12
Year of hormonal therapy start (adjuvant or unspecified)	F	9999	≥ Year of incidence
Day of hormonal therapy end (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 31
Month of hormonal therapy end (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 12
Year of hormonal therapy end (adjuvant or unspecified)	F	9999	≥ Year of incidence
Hormonal therapy centre (adjuvant or unspecified)	A	9	National coding system
Day of hormonal therapy start (neoadjuvant)	F	99	Range of allowed values: From 1 to 31
Month of hormonal therapy start (neoadjuvant)	F	99	Range of allowed values: From 1 to 12
Year of hormonal therapy start (neoadjuvant)	F	9999	≥ Year of incidence
Day of hormonal therapy end (neoadjuvant)	F	99	Range of allowed values: From 1 to 31
Month of hormonal therapy end (neoadjuvant)	F	99	Range of allowed values: From 1 to 12
Year of hormonal therapy end (neoadjuvant)	F	9999	≥ Year of incidence
Hormonal therapy centre (neoadjuvant)	A	9	National coding system

Table 3. Cont.

Variable description	Format	Missing/ unknown	Coding
Unspecified therapy	F	9*	0 → No 1 → Yes, without other specification 2 → Yes, neoadjuvant (pre-operative) 3 → Yes, adjuvant (post-operative) 4 → Yes, both neoadjuvant and adjuvant
Day of unspecified therapy start (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 31
Month of unspecified therapy start (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 12
Year of unspecified therapy start (adjuvant or unspecified)	F	9999	≥ Year of incidence
Day of unspecified therapy end (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 31
Month of unspecified therapy end (adjuvant or unspecified)	F	99	Range of allowed values: From 1 to 12
Year of unspecified therapy end (adjuvant or unspecified)	F	9999	≥ Year of incidence
Unspecified therapy centre (adjuvant or unspecified)	A	9	National coding system
Day of unspecified therapy start (neoadjuvant)	F	99	Range of allowed values: From 1 to 31
Month of unspecified therapy start (neoadjuvant)	F	99	Range of allowed values: From 1 to 12
Year of unspecified therapy start (neoadjuvant)	F	9999	≥ Year of incidence
Day of unspecified therapy end (neoadjuvant)	F	99	Range of allowed values: From 1 to 31
Month of unspecified therapy end (neoadjuvant)	F	99	Range of allowed values: From 1 to 12
Year of unspecified therapy end (neoadjuvant)	F	9999	≥ Year of incidence
Unspecified therapy centre (neoadjuvant)	A	9	National coding system

F: Numeric variable A: Alphanumeric variable

* Registries that can't distinguish between 'missing/unknown' or 'no' (chemotherapy/targeted therapy/immunotherapy/hormonal therapy/unspecified therapy), are advised to report 'no' (chemotherapy/targeted therapy/immunotherapy/hormonal therapy/unspecified therapy), and mention their incapacity to make this distinction in a separate remark.

4. STEM CELL TRANSPLANTATION

Table 4. *Stem cell variable description.*

Variable description	Format	Missing/ unknown	Coding
Stem cell transplantation (SCT)	F	9	0 → No 1 → Yes
Day of SCT	F	99	Range of allowed values: From 1 to 31
Month of SCT	F	99	Range of allowed values: From 1 to 12
Year of SCT	F	9999	≥ Year of incidence

Note: induction chemotherapy as part of a stem cell transplantation procedure does not need to be registered separately as 'chemotherapy'. Such chemotherapy can be considered as an integral part of the SCT. The same counts for whole body radiation therapy administered in the preparatory phase of a stem cell transplantation.

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5. REASON FOR NO TREATMENT

Table 5. *Reason for no treatment variable description.*

Variable description	Format	Missing/ unknown	Coding
Reason for no anticancer treatment	F	9	1 → Watchful waiting 2 → Active surveillance 3 → Watchful waiting or active surveillance 4 → Refusal 5 → Symptomatic treatment only 6 → Unspecified 7 → Patient's death

Watchful waiting is an expectant management approach e.g., in prostate cancer characterized by a passive stance, deferring treatment unless deemed necessary.
Active surveillance, commonly used in prostate and urethral cancer, is a proactive monitoring strategy involving systematic observation and timely curative intervention if required[19].
Watchful waiting or active surveillance can be seen as primary 'treatment' approaches and need to be recorded as such. In case the disease evolves rapidly and active treatment follows (eg surgery or radiotherapy), the latter treatments do not need to be captured.

[19] See for instance *Prostate cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up* and the NCI Dictionary of Cancer Terms.

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Appendix 1: Working Group Members

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Appendix 2: Anatomical Therapeutic Chemical (ATC) Codes, Generic and Trade Names

This appendix provides you with a broad indicative overview of the ATC codes that might be considered for each systemic therapy type (chemotherapy, hormonal therapy, targeted therapy, immunotherapy). Please note that these lists intend to be illustrative and supportive, but can for several reasons not be considered limitative and exhaustive.
Drugs may be administered for various indications; however only drugs intended as active 'anti-cancer treatment' are to be recorded. This excludes medications that are provided as substitution therapy (e.g. thyroid hormones following thyroidectomy) or supportive care (eg anti-emetics, bone marrow growth factors,…). New drugs entering the market also retain these lists from being exhaustive.
Updated information on ATC classification can be found in the WHO browser (https://atcddd.fhi.no/atc_ddd_index/).
More detailed ATC lists are considered to be part of Tier 2 organ-specific recommendations on treatment data.

Chemotherapy

ATC code	Generic name	Trade name
L01AA01	Cyclophosphamide	ENDOXAN
		CYCLOPHOSPHAMIDE
		GENOXAL
		LEDOXINA
		SENDOXAN
		DEMACYLAN
L01AA02	Chlorambucil	LEUKERAN
		CHLORAMINOPHÈNE
		CHLORAMBUCIL
L01AA03	Melphalan	ALKERAN
		MELFALAN
		MELPHALAN
L01AA05	Chlormethine	LEDAGA
L01AA06	Ifosfamide	HOLOXAN
		IFOSFAMIDE
		TRONOXAL

Chemotherapy (cont.)

ATC code	Generic name	Trade name
L01AA09	Bendamustine	LEVACT
		BENDAMUSTINE
		AUBEDIX
		BENMAK
		RIBOMUSTIN
		BENDAMYL
		BENDISTIN
		BENTALYA
		LEDUFAN
		LYNETORIL
		MUSTINAL
		NIVOBRAL
		RHOMUSTIN
		RIBOVACT
		TABINAZ
L01AB01	Busulfan	MYLERAN
		BUSULFEX
		BUSILVEX
L01AB02	Treosulfan	TRECONDI
		TREOSULFAN
		OVASTAT
L01AC01	Thiotepa	TEPADINA
		THIOPLEX
L01AD01	Carmustine	BICNU
		CARMUBRIS
		GLIADEL
		CARMUSTINE OBVIUS
L01AD02	Lomustine	BELUSTINE
		CECENU
		LOMUSTINE
L01AX03	Temozolomide	TEMODAL
		TEMODAR
		TEMCAD
		TEMOMEDAC

Chemotherapy (cont.)

ATC code	Generic name	Trade name
L01AX04	Dacarbazine	DTIC
L01BA01	Methotrexate	JYLAMVO
		OTREXUP
		RASUVO
		METHOTREXATE
		METOJECT
		EMTHEXATE
		TREXAN
		NORDIMET
L01BA03	Raltitrexed	TOMUDEX
L01BA04	Pemetrexed	ALIMTA
		ARMISARTE
		CIAMBRA
		PEMFEXY
L01BB02	Mercaptopurine	PURI-NETHOL
		XALUPRINE
		MERCAPTOPURINE
		MEDIPURIN
L01BB03	Tioguanine	LANVIS
		THIOGUANIN
		THIOSIX
L01BB04	Cladribine	LEUSTATIN
		MAVENCLAD
		LITAK 10
L01BB05	Fludarabine	FLUDARA
		FLUDARABINE
		FLUMEN
L01BB05	Fludarabine	SINDARABIN
		BENDARABIN
		FLUDALYM
L01BB06	Clofarabine	EVOLTRA
		IVOZALL

Chemotherapy (cont.)

ATC code	Generic name	Trade name
L01BB07	Nelarabine	ATRIANCE
L01BC01	Cytarabine	ALEXAN
		CYTARABINE
		CYTOSAR
		DEPOCYTE
L01BC02	Fluorouracil	FLUOROURACIL
		FLUOROURACIL 5
		5-FU
		EFUDIX
		FLUORAXAN
		FLURABLASTIN
		FLURACEDYL
		RIBOFLUOR
L01BC05	Gemcitabine	GEMCITABINE
		GEMBIN
		GEMZAR
L01BC06	Capecitabine	CAPECITABINE
		XELODA
		COLOXET
		ECANSYA
L01BC07	Azacitidine	VIDAZA
L01BC08	Decitabine	DACOGEN
L01BC09	Floxuridine	FUDR
L01BC52	Fluorouracil, combinations	FLUOROURACIL
L01BC53	Tegafur combinations	UFT
		FTORAFUR
		TEYSUNO
		UTEFOS
L01BC59	Trifluridine, combinations	LONSURF
		THILOL
		VIROPHTA

Chemotherapy (cont.)

ATC code	Generic name	Trade name
L01CA01	Vinblastine	VINBLASTIN
		VELBAN
		VELBE
		CYTOBLASTIN
L01CA02	Vincristine	VINCRISTIN
		ONCOVIN
		VINCRISIN
		VINCRISUL
		VINCASAR PFS
		FARMISTIN
		CYTOCRISTIN
		CELLCRISTIN
L01CA03	Vindesine	ELDISINE
		GESIDINE
		ENISON
L01CA04	Vinorelbine	NAVELBINE
		VINORELBIN
		NAVIN
		NAVIREN
L01CA05	Vinflunine	JAVLOR
L01CB01	Etoposide	ETOPOSIDE
		ETOPOPHOS
		TOPOSAR
		VEPESID
		LASTET
		CELLTOP
		EPOSIN
		ETOMEDAC
		ETOSID
		EXITOP
L01CB02	Teniposide	VUMON

Chemotherapy (cont.)

ATC code	Generic name	Trade name
L01CD01	Paclitaxel	PACLITAXEL
		TAXOL
		PACLITAXIN
		ABRAXANE
		SINDAXEL
		ANZATAX
		ARITAXEL
		BENDATAX
		BIOTAXEL
		BREVITAX
		EBETAXEL
		EUCOL
		GENEXOL
		LETPAR
		PACLIXEL
		PACOVARY
		PATAXEL
		PAXENE
		PAXITAL
		TAXOMEDAC
L01CD02	Docetaxel	TAXOTERE
		DOCETAXEL
		BENDADOCEL
		CAMITOTIC
		CETADOCURE
		DEMOTAXEL
		DOCEXEL
		DOTAXEL
		DOXEL
		DOXEN
		EDOXEL
		FINAXEL
		QVIDADOTAX
		RIBODOCEL

Chemotherapy (cont.)

ATC code	Generic name	Trade name
L01CD02 (ctd)	Docetaxel (ctd)	SYMTAXEL
		TAXCEUS
		TAXEGIS
		TAXESPIRA
		TAXOVINA
		TEDOCAD
		TOLNEXA
		DOCETAX
L01CD04	Cabazitaxel	JEVTANA
L01CX01	Trabectedin	YONDELIS
L01DA01	Dactinomycin	COSMEGEN
L01DB01	Doxorubicin	DOXORUBICIN
		CAELYX
		ADRIBLASTIN
		DEBDOX
		MYOCET
		XORUCIN
		ADRIMEDAC
		AXIDOXO
		DOXIPROL
		DOXOTIL
		FARMIBLASTINA
		RASTOCIN
		RUBIDOX
		SINDROXOCIN
L01DB02	Daunorubicin	DAUNOXOME
		CERUBIDIN
		DAUNOBLASTINA
		DAUNORUBICIN
L01DB03	Epirubicin	FARMORUBICIN
		EPIRUBICIN
		EPILEM
		EPISINDAN
		AXIRUBICIN-E

Chemotherapy (cont.)

ATC code	Generic name	Trade name
L01DB03 (ctd)	Epirubicin (ctd)	BENDAEPI
		CENEBIR
		CIAZIL
		EPI TEVA
		EPIBRA
		EPIMEDAC
		EPIRUB
		MEGARUBICIN
		RIBOEPI
		RUBENS
L01DB06	Idarubicin	ZAVEDOS
		IDARUBICIN
		IDAMEN
L01DB07	Mitoxantrone	MITOXANTRON
		ONCOTRONE
		NOVANTRONE
		STRIMAX
		EBEXANTRON
		ELSEP
		RALENOVA
		GENEFADRONE
		REFADOR
		XANTROSIN
L01DB11	Pixantrone	PIXUVRI
		PIXUVIR
L01DC01	Bleomycin	BLEOCIN
		BLEOMYCIN
		BLEO-KYOWA
		BLEOLEM
		BLEOMEDAC
		BLEOCELL
L01DC03	Mitomycin	MITOMYCIN C
		AMETYCINE
		MITEM

Chemotherapy (cont.)

ATC code	Generic name	Trade name
		MITO-EXTRA
		MITO-MEDAC
L01DC03 (ctd)	Mitomycin (ctd)	MITOSTAT
		MUTAMYCIN
		UROCIN
		CISPLATIN
		SINPLATIN
		PLATINOL
		PLATIDIAM
		PLATINEX
		ESOPLATIN
		PLATAMINE
L01XA01	Cisplatin	PLATOSIN
		CISPLATYL
		CITOPLATINO
		NEOPLATIN
		PLACIS
		PLATISTIL
		PLATISTINE
L01XA02	Carboplatin	CARBOPLATIN
		PARAPLATIN
		AXICARB
		BOPACATIN
		CARBATACIN
		CARBOMEDAC
		CARBOPLAN
		CARBOPLASIN
		CARBOSIN
		CARMEN
		CYCLOPLATIN
		HAEMATO-CARB
		MEGAPLATIN
		EMORZYM
		PLATINWAS

Chemotherapy (cont.)

ATC code	Generic name	Trade name
L01XA03	Oxaliplatin	ELOXATIN
		OXALIPLATIN
		AXIPLATIN
		BENDAPLATIN
		ELATOFEN
		GENEPLATIN
		GESSEDIL
		LINOXA
		LINOXAL
		LIVELLIN
		MEDOXA
		OXALIMED
		OXALIPROL
		OXALISIN
		OXALIZOR
		OXAPLAMYL
		OXAVIATIN
		PLATOX
		RECTOXAL
		RIBOXATIN
		SINOXAL
		VELMINOX
		XOPLAN
L01XB01	Procarbazine	NATULAN
		PROCARBAZINE
L01XX01	Amsacrine	AMSIDYL
		AMEKRIN
		AMSACRINE
		AMSALYO
		AMSIDINE
L01XX02	Asparaginase	ASPARAGINASE
		ERWINASE
		KIDROLASE
		SPECTRILA

Chemotherapy (cont.)

ATC code	Generic name	Trade name
L01XX03	Altretamine	HEXALEN
		HEXASTAT
L01XX05	Hydroxycarbamide	HYDREA
		HYDROXYCARBAMID
		SIKLOS
		HYDREASYN
		HYDROXYUREA
		LITALIR
		ONCO-CARBIDE
L01XX08	Pentostatin	NIPENT
L01XX11	Estramustine	ESTRACYT
		ESTRAMUSTIN
		MULTOSIN
L01XX14	Tretinoin	VESANOID
		TRETINOIN
L01XX17 (L01CE01 from 01/01/2021)	Topotecan	HYCAMTIN
		TOPOTECAN
		POTACTASOL
		LUTECAN
		TOPOCAN
	Topotecan (*cont.*)	TOPOVIN
L01XX19 (L01CE02 from 01/01/2021)	Irinotecan	IRINOTECAN
		CAMPTO
		ONIVYDE
		IRINOTESIN
		CAMPTERIL
		IRITEC
		VIARITEC
		ARINOTEC
		IRICAM
		IRICAN
		IRINOCAN
		IRINOCOL

Chemotherapy (cont.)

ATC code	Generic name	Trade name
L01XX19 (L01CE02 from 01/01/2021) (ctd)	Irinotecan (ctd)	IRINOKABI
		IRINOLIQUID
		IRINOMEDAC
		IRINOSYN
		IRINTO
		MIZANTRONE
		NEOTECAN
		NEVOTECAM
		NOXECAN
		RIBOIRINO
		SANTACIL
		TEKAMEN
		VINTECAN
		XAVETTA
L01XX23	Mitotane	LYSODREN
L01XX24	Pegaspargase	ONCASPAR
L01XX25	Bexarotene	TARGRETIN
L01XX27	Arsenic trioxide	TRISENOX
		ARSENIC TRIOXIDE
L01XX32	Bortezomib	VELCADE
		BORTEZOMIB
		BORTEADE
		BORTECLARMIA
		BORTEGA
		SANGREL
		VORTEMYEL
		ZEGOMIB
L01XX41	Eribulin	HALAVEN
L01XX42	Panobinostat	FARYDAK

Hormonal therapy

ATC code	Generic name	Trade name
G03AC05	Megestrol acetate	MEGOXI
		MEGYRINA
		O'TENTIKA
		BOREA
		CACHEXAN
		GESTROL
		MAYGACE
		MEGALIA
		MEGAPLEX
		MEGASTRIL
		MEGEFREN
		MEGESIN
		MEGESTAT
		MEGESTIL
		MEGESTROL
		MEGOSTAT
G03DA02	Medroxyprogesterone acetate	PROVERA
		FARLUTAL
		SAYANA
		CLIMANOR
		CYKRINA
		DEPO-CLINOVIR
		DEPOCON
		DEPO-PRODASONE
		PROGEVERA
		ELASHINE
		MPA
		PRODAFEM
		SAYANAJECT
G03HA01	Cyproterone acetate	ANDROCUR
		IMVEL
		ANDRO-DIANE
		ANDROTERONE
		CYPROPLEX

Hormonal therapy (cont.)

ATC code	Generic name	Trade name
G03HA01 (ctd)	Cyproterone acetate (ctd)	CYPROSTAT
		CYPROTERON
		CYSAXAL
		ERAPYL
L02AA02	Polyestradiol phosphate	ESTRADURIN
L02AB03	Gestonorone caproate	DEPOSTAT
L02AE01	Buserelin	SUPREFACT
		SUPRECUR
		METRELEF
		PROFACT
L02AE02	Leuprorelin	ELIGARD
		LUCRIN DEPOT
		LEUPRORELIN
		LEPTOPROL
		LEUPROSTIN
		LUPRON
		LUTRATE DEPOT
		DARONDA
		DEPO-ELIGARD
		ENANTON DEPOT
		ENANTONE
		GINECRIN DEPOT
		LECTRUM
		LERIN
		LEUPROL
		LEUPRONE HEXAL
		LUTRATE
		POLITRATE
		PROCREN DEPOT
		PROCRIN
		PROSTAP
		PROSTAPLANT
		SIXANTONE
		TRENANTONE

Hormonal therapy (cont.)

ATC code	Generic name	Trade name
L02AE03	Goserelin	ZOLADEX
		ALGONAD
		GOLEXIN
		RESELIGO
		XANDERLA
L02AE04	Triptorelin	DECAPEPTYL
		DIPHERELINE
		GONAPEPTYL
		ARVEKAP
		TRIPTOFEM
		MOAPAR
		SALVACYL
L02AE05	Histrelin	VANTAS
L02BA01	Tamoxifen	NOLVADEX
		TAMOXIFEN
		TAMIFEN
		SOLTAMOX
		NOVOFEN
		ADIFEN
		KESSAR
		NOMAFEN
		TADEX
		TAMEC
		TAMIZAM-20
		TAMOPLEX
		TAMOX - 1 A PHARMA
		TAMOXENE
		ZITAZONIUM
		ZYMOPLEX
L02BA02	Toremifene	FARESTON
L02BA03	Fulvestrant	FASLODEX
		FALVAX
		FULVESTRANT

Hormonal therapy (cont.)

ATC code	Generic name	Trade name
L02BB01	Flutamide	FLUTASIN
		FLUTAMIDE
		APO-FLUTAM
		ELBAT
		EULEXIN
		FLUMID
		FLUPROSIN
		FLUTAN
		FLUTASTAD
		GRISETIN
		PROFAMID
		PROSNEO
		PROSTACUR
		PROSTANDRIL
		RICALIDE
		FLUCINOM
L02BB03	Bicalutamide	BICALUTAMIDE
		CASODEX
		ANDROBLOC
		ANDROCAL
		APEX
		BELANTIS
		BICACEL
		BICACTA
		BICADEX
		BICALAN
		BICALGEN
		BICALODEX
		BICALOX
		BICALUPLEX
		BICALUSTAD
		BICALUT
		BICALUTAGEN
		BICALUTANORM

Hormonal therapy (cont.)

ATC code	Generic name	Trade name
		BICALUTIN
		BICAMED
		BICAMIDE
		BICAPROCAN
		BICAPROL
		BICAPROX
		BICA-Q
		BICARBEX
		BICASTAD
		BICATIN
		BICLUTIDE
		BICUSAN
		BIKALARD
		BIKALEN
		BIKALIS
		BILUMID
		BILUMIDE
		BILURON
		BINABIC
		BIOBICA
		BIXALAN
		BJORGEINA
L02BB03	Bicalutamide (*cont.*)	CALUMID
		CALUTIN
		CAPRO
		ENCALOR
		KALUFAR
		LANBICA
		LUTAMID
		LUTRAK
		OMIDEX
		ORMANDYL
		PRAXIS
		PROBIC

Hormonal therapy (cont.)

ATC code	Generic name	Trade name
L02BB03	Bicalutamide (*cont.*)	PROBICON
		PROCADEX
		PROCURE
		SAFEDEX
		SAVEPROST
		TOSADEX
		VERODEX
		WIBICAL
		YONISTIB
		ZARMOL
L02BB04	Enzalutamide	XTANDI
L02BB05	Apalutamide	ERLEADA
L02BB06	Darolutamide	NUBEQA
L02BG01	Aminoglutethimide	ORIMETEN
		MAMOMIT
		AMINOGLUTETHIMID
		ROGLUTEN
L02BG03	Anastrozole	ARIMIDEX
		ANASTROZOL
		AGERDEX
		ALOZEX
		ALTRAVESA
		AMENUR
		ANABLOCK
		ANABREST
		ANALIS
		ANAPREX
		ANAROMAT
		ANASTAR
		ANASTELB
		ANASTRALAN
		ANASTRAZE
		ANASTRIS
		ANASTRO-CELL

Hormonal therapy (cont.)

ATC code	Generic name	Trade name
		ANASTROGEN
		ANASTROHEXAL
		ANASTROLAN
		ANASTROMIN
		ANASTROZEX
		ANAYA
		ANAZOL
		ANKARMA
		ANSYN
		APO-NASTROL
		AREMED
		ARILLA
		ARMOTRAZ
		ASTRALIS
		ASTRAZOL
		ATROCELA
		ATROZOL
		AXASTROL
		AZONET
		BARSTRA
		DELTASOLDE
		EGISTROZOL
L02BG03	Anastrozole (*cont.*)	EPSISOLDE
		ERISTROL
		EXTROPLEX
		GAMMASOLDE
		KYARESTA
		LONDER
		MAMMOZOLE
		MAMOSTROL
		MIVISIA
		NASTRIN
		OZOLAN
		RAOLOZ

Hormonal therapy (cont.)

ATC code	Generic name	Trade name
L02BG03	Anastrozole (*cont.*)	RENAZOLE
		RIMIDAL
		STRAKIR
		STRAZOLAN
		TRASOLETTE
		ZELOTRIN
		ZOLITRAT
		ZOLKIR
		ZOLZYN
		ZYNZOL
L02BG04	Letrozole	FEMARA
		LETROZOL
		ALETRO
		AROMED
		AROMEK
		AVOMIT
		CALANTHA
		CLARZOLE
		DRACENAX
		ELOZORA
		ETRUZIL
		FAMOS
		FEMAPLEX
		FEMAR
		FEMAZAC
		FEMOZOL
		FEMTOZONE
		FLORAZOLE
		GALDAR
		GOSURAN
		LAMETTA
		LEONCON
		LERANA
		LETMYLAN

Hormonal therapy (cont.)

ATC code	Generic name	Trade name
L02BG04	Letrozole (*cont.*)	LETRAFEM
		LETRALAN
		LETRASAN
		LETRAXON
		LETRILAN
		LETROBLOCK
		LETROFAM
		LETROFAR
		LETROFEM
		LETROFEMIN
		LETROGER
		LETROHEXAL
		LETROLAN
		LETROMAL
		LETROMAN
		LETROMEDAC
		LETROMYL
		LETROPEN
		LETROSTAR
		LETROVENA
		LETROZIN
		LETROZOLUM
		LETROZOMAX
		LEVETIRACETAM
		LEZRA
		LIKARDA
		LOOSYN
		LORTANDA
		LOSTAR
		LOTESTROL
		LOXIFAN
		LOXOPREL
		MIONIC
		PICOZETTE

Hormonal therapy (cont.)

ATC code	Generic name	Trade name
L02BG04	Letrozole (*cont.*)	PICOZONE
		RATROZ
		RELIGAN
		SADERON
		SILETRIS
		STEFAPLEX
		SYMLETROL
		TROZARA
		TROZEL
		VIOBREST
		ZEQUIPRA
L02BG06	Exemestane	AROMASIN
		EXEMESTAN
		ALMESTEN
		ALVOSTAN
		AROMAPLEX
		AROMASIL
		AROMESTAN
		AROSTANIL
		ASTEXANA
		AXELTA
		COTAMOX
		ESCEPRAN
		ETADRON
		EXEDRAL
		EXEGEN
		EXEMESIN
		EXEMIN
		EXEREGIO
		EXESTAN
		GEPEX
		GLANDEX
		INPLAVIA
		MEMELIN

Hormonal therapy (cont.)

ATC code	Generic name	Trade name
L02BG06	Exemestane (ctd)	NATERAN
		NODUTAX
		PERAMIT
		PIEXTANE
		SYMEX
		XANEPRA
L02BX01	Abarelix	PLENAXIS
L02BX02	Degarelix	FIRMAGON
L02BX03	Abiraterone acetate	ZYTIGA

Targeted therapy

ATC code	Generic name	Trade name
L01XC02 (L01FA01 from 01/01/2022)	Rituximab	MABTHERA
		BLITZIMA
		RITEMVIA
		RITUZENA
		RIXANTHON
		RIXATHON
		RIXIMYO
		TRUXIMA
		TUXELLA
L01XC03 (L01FD01 from 01/01/2022)	Trastuzumab	HERCEPTIN
		HERZUMA
		KADCYLA
		KANJINTI
		ONTRUZANT
		TRAZIMERA
L01XC04 (L04AA34 from 01/01/2015)	Alemtuzumab	LEMTRADA
		MABCAMPATH
L01XC05 (L01FX02 from 01/01/2022)	Gemtuzumab ozogamicin	MYLOTARG
L01XC06 (L01FE01 from 01/01/2022)	Cetuximab	ERBITUX
L01XC07 (L01FG01 from 01/01/2022)	Bevacizumab	AVASTIN
		MVASI
L01XC08 (L01FE02 from 01/01/2022)	Panitumumab	VECTIBIX
L01XC09 (L01FX03 from 01/01/2022)	Catumaxomab	REMOVAB
L01XC10 (L01FA02 from 01/01/2022)	Ofatumumab	ARZERRA
L01XC11 (L01FX04 from 01/01/2022)	Ipilimumab	YERVOY
L01XC12 (L01FX05 from 01/01/2022)	Brentuximab vedotin	ADCETRIS
L01XC13 (L01FD02 from 01/01/2022)	Pertuzumab	PERJETA
L01XC14 (L01FD03 from 01/01/2022)	Trastuzumab emtansine	KADCYLA
L01XC15 (L01FA03 from 01/01/2022)	Obinutuzumab	GAZYVARO
		GAZYVA
L01XC16 (L01FX06 from 01/01/2022)	Dinutuximab beta	UNITUXIN
		DINUTUXIMAB BETA
		QARZIBA

Targeted therapy (cont.)

ATC code	Generic name	Trade name
L01XC17 (L01FF01 from 01/01/2022)	Nivolumab	OPDIVO
		NIVOLUMAB
L01XC18 (L01FF02 from 01/01/2022)	Pembrolizumab	KEYTRUDA
L01XC19 (L01FX07 from 01/01/2022)	Blinatumomab	BLINCYTO
L01XC21 (L01FG02 from 01/01/2022)	Ramucirumab	CYRAMZA
L01XC22 (L01FE03 from 01/01/2022)	Necitumumab	PORTRAZZA
L01XC23 (L01FX08 from 01/01/2022)	Elotuzumab	EMPLICITI
L01XC24 (L01FC01 from 01/01/2022)	Daratumumab	DARZALEX
		DARATUMUMAB
L01XC25 (L01FX09 from 01/01/2022)	Mogamulizumab	POTELIGEO
L01XC26 (L01FB01 from 01/01/2022)	Inotuzumab ozogamicin	BESPONSA
L01XC27 (L01FX10 from 01/01/2022)	Olaratumab	LARTRUVO
L01XC28 (L01FF03 from 01/01/2022)	Durvalumab	IMFINZI
L01XC29 (L01FX11 from 01/01/2022)	Bermekimab	XILONIX
L01XC31 (L01FF04 from 01/01/2022)	Avelumab	BAVENCIO
		AVELUMAB
L01XC32 (L01FF05 from 01/01/2022)	Atezolizumab	TECENTRIQ
L01XC33 (L01FF06 from 01/01/2022)	Cemiplimab	LIBTAYO
L01XE01 (L01EA01 from 01/01/2021)	Imatinib	GLIVEC
		IMATINIB
		ANZOVIP
		ASTREA
		DEVATINIB
		EGITINID
		GLIPOX
		IMAKREBIN
		IMAREM
		IMATENIL
		IMAVEC
		ITIVAS
		LATIB
		LETINIB
		LEUTIPOL
	Imatinib (*cont.*)	LEUZEK

Targeted therapy (cont.)

ATC code	Generic name	Trade name
L01XE01 (L01EA01 from 01/01/2021)		MARIMAB
		MEAPAX
		MEAXIN
		NEOPAX
		NIBIX
		TELUX
		TIBALDIX
		HRONILEUCEM
		IMAGEROLAN
		IMANIVEC
		IMATEK
		MYLAUKIM
		NEOXELL
		VIANIB
L01XE02 (L01EB01 from 01/01/2021)	Gefitinib	IRESSA
		GEFITINIB
		GEFINOR
L01XE03 (L01EB02 from 01/01/2021)	Erlotinib	TARCEVA
		ERLOTINIB
		VARLOTA
		MITROXELEN
L01XE04 (L01EX01 from 01/01/2021)	Sunitinib	SUTENT
		SUNITINIB
L01XE05 (L01EX02 from 01/01/2021)	Sorafenib	NEXAVAR
L01XE06 (L01EA02 from 01/01/2021)	Dasatinib	SPRYCEL
		DASATINIB
L01XE07 (L01EH01 from 01/01/2021)	Lapatinib	TYVERB
L01XE08 (L01EA03 from 01/01/2021)	Nilotinib	TASIGNA
L01XE09 (L01EG01 from 01/01/2021)	Temsirolimus	TORISEL
L01XE10 (L01EG02 from 01/01/2021)	Everolimus	CERTICAN
		AFINITOR
		VOTUBIA
		ADEROLIO
		EVEROLIMUS

Targeted therapy (cont.)

ATC code	Generic name	Trade name
L01XE10 (L01EG02 from 01/01/2021)	Everolimus (*cont.*)	LINEVERO
L01XE11 (L01EX03 from 01/01/2021)	Pazopanib	VOTRIENT
L01XE12 (L01EX04 from 01/01/2021)	Vandetanib	CAPRELSA
L01XE13 (L01EB03 from 01/01/2021)	Afatinib	GIOTRIF
L01XE14 (L01EA04 from 01/01/2021)	Bosutinib	BOSULIF
L01XE15 (L01EC01 from 01/01/2021)	Vemurafenib	ZELBORAF
L01XE16 (L01ED01 from 01/01/2021)	Crizotinib	XALKORI
L01XE17 (L01EK01 from 01/01/2021)	Axitinib	INLYTA
L01XE18 (L01EJ01 from 01/01/2021)	Ruxolitinib	JAKAVI
L01XE21 (L01EX05 from 01/01/2021)	Regorafenib	STIVARGA
L01XE23 (L01EC02 from 01/01/2021)	Dabrafenib	TAFINLAR
L01XE24 (L01EA05 from 01/01/2021)	Ponatinib	ICLUSIG
L01XE25 (L01EE01 from 01/01/2021)	Trametinib	MEKINIST
L01XE26 (L01EX07 from 01/01/2021)	Cabozantinib	COMETRIQ
		CABOMETYX
		CABLIVI
L01XE27 (L01EL01 from 01/01/2021)	Ibrutinib	IMBRUVICA
L01XE28 (L01ED02 from 01/01/2021)	Ceritinib	ZYKADIA
L01XE29 (L01EX08 from 01/01/2021)	Lenvatinib	KISPLYX
		LENVIMA
L01XE31 (L01EX09 from 01/01/2021)	Nintedanib	OFEV
		VARGATEF
L01XE33 (L01EF01 from 01/01/2021)	Palbociclib	IBRANCE
L01XE34 (L01EK03 from 01/01/2021)	Tivozanib	FOTIVDA
L01XE35 (L01EB04 from 01/01/2021)	Osimertinib	TAGRISSO
L01XE36 (L01ED03 from 01/01/2021)	Alectinib	ALECENSA
L01XE38 (L01EE02 from 01/01/2021)	Cobimetinib	COTELLIC
L01XE39 (L01EX10 from 01/01/2021)	Midostaurin	RYDAPT
		MIDOSTAURINE
L01XE41 (L01EE03 from 01/01/2021)	Binimetinib	MEKTOVI
L01XE42 (L01EF02 from 01/01/2021)	Ribociclib	KISQALI
L01XE43 (L01ED04 from 01/01/2021)	Brigatinib	ALUNBRIG
L01XE44 (L01ED05 from 01/01/2021)	Lorlatinib	LORVIQUA
L01XE45 (L01EH02 from 01/01/2021)	Neratinib	NERLYNX

Targeted therapy (cont.)

ATC code	Generic name	Trade name
L01XE46 (L01EC03 from 01/01/2021)	Encorafenib	BRAFTOVI
L01XE47 (L01EB07 from 01/01/2021)	Dacomitinib	VIZIMPRO
L01XE50 (L01EF03 from 01/01/2021)	Abemaciclib	VERZENIOS
L01XE51 (L01EL02 from 01/01/2021)	Acalabrutinib	CALQUENCE
L01XE52 (L01EX11 from 01/01/2021)	Quizartinib	VANFLYTA
L01XE53 (L01EX12 from 01/01/2021)	Larotrectinib	VITRAKVI
L01XE54 (L01EX13 from 01/01/2021)	Gilteritinib	XOSPATA
L01XE56 (L01EX14 from 01/01/2021)	Entrectinib	ROZLYTREK
L01XX43 (L01XJ01 from 01/01/2021)	Vismodegib	ERIVEDGE
L01XX44	Aflibercept	ZALTRAP
L01XX45 (L01XG02 from 01/01/2021)	Carfilzomib	KYPROLIS
L01XX46 (L01XK01 from 01/01/2021)	Olaparib	LYNPARZA
L01XX47 (L01EM01 from 01/01/2021)	Idelalisib	ZYDELIG
L01XX48 (L01XJ02 from 01/01/2021)	Sonidegib	ODOMZO
L01XX50 (L01XG03 from 01/01/2021)	Ixazomib	NINLARO
L01XX52	Venetoclax	VENCLYXTO
L01XX54 (L01XK02 from 01/01/2021)	Niraparib	ZEJULA
L01XX55 (L01XK03 from 01/01/2021)	Rucaparib	RUBRACA
L01XX60 (L01XK04 from 01/01/2021)	Talazoparib	TALZENNA
L01XX61 (L01EM02 from 01/01/2021)	Copanlisib	ALIQOPA
L01XX63 (L01XJ03 from 01/01/2021)	Glasdegib	DAURISMO
L01XX65 (L01EM03 from 01/01/2021)	Alpelisib	PIQRAY
L01XY02 (L01FY01 from 01/01/2024)	Pertuzumab and Trastuzumab	PHESGO[20]
L01XY03 (L01FY02 from 01/01/2024)	Nivolumab and Relatlimab	OPDUALAG
L04AX02	Thalidomide	THALIDOMIDE
L04AX04	Lenalidomide	REVLIMID
		LENALIDOMIDE
L04AX06	Pomalidomide	IMNOVID

[20] pertuzumab/trastuzumab/hyaluronidase-zzfx

Immunotherapy

ATC code	Generic name	Trade name
L01XL05	Ciltacabtagene autoleucel*	CARVYKTI
L01XL06	Brexucabtagene autoleucel*	TECARTUS
L01XL07	Idecabtagene vicleucel*	ABECMA
L01XL08	Lisocabtagene maraleucel*	BREYANZI
L01XX51 (L01XL02 from 01/01/2021)	Talimogene laherparepvec	IMLYGIC
L01XX70 (L01XL03 from 01/01/2023)	Axicabtagene ciloleucel*	YESCARTA
L01XX71 (L01XL04 from 01/01/2023)	Tisagenlecleucel*	KYMRIAH
L03AB01	Interferon alfa natural	ALFAFERONE
		EGIFERON
		MULTIFERON
L03AB04	Interferon alfa-2a	ROFERON-A
L03AB05	Interferon alfa-2b	REALDIRON
		INTRON A
		INTRONA
		REFERGEN
		VIRAFERON
L03AC01	Aldesleukin	PROLEUKIN
L03AX03	BCG vaccine	BCG-MEDAC
		IMMUCYST
		ONCOTICE
		ONKO

*CAR-T cell therapy