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# European Cancer Model → FHIR Resources

Mapping European Cancer Model to FHIR Resources

## Main Entities

| **European Cancer Model** | **FHIR Resource** | **Notes** |
| --- | --- | --- |
| Patient | Patient | Direct mapping |
| Demographics | Patient (demographic elements) | Included in Patient resource |
| Comorbidities | Condition | With category to indicate comorbidities |
| Cancer Condition | Condition | With "oncology" or appropriate category |
| Treatment | Procedure / MedicationAdministration | Depends on treatment type |
| Treatment Plan | CarePlan | For treatment planning |
| Visit | Encounter | For visits and episodes of care |

## Procedures and Treatments

| **European Cancer Model** | **FHIR Resource** | **Notes** |
| --- | --- | --- |
| Surgery | Procedure | With specific code for surgery |
| Radiotherapy | Procedure | With code for radiotherapy |
| Drug Administration | MedicationAdministration | For medication administration |
| Biopsy | Procedure / Specimen | Procedure for collection, Specimen for the sample |
| Active Surveillance | Procedure / CarePlan | Can be modeled as care plan |
| Imaging | ImagingStudy / DiagnosticReport | ImagingStudy for images, DiagnosticReport for reports |
| Lab | Observation / DiagnosticReport | For laboratory results |
| Biomarker | Observation | With appropriate codes for biomarkers |

## Oncology Clinical Elements

| **European Cancer Model** | **FHIR Resource** | **Notes** |
| --- | --- | --- |
| Cancer Definition | Condition (details) | Using extensions for histology/morphology |
| Histology/Behaviour | Observation | Or as Condition extension |
| Body Site | Condition.bodySite | Standard element in Condition |
| Tumor Grade | Observation | With appropriate LOINC/SNOMED codes |
| Cancer Stage | Observation | Using TNM staging system codes |
| Disease Status | Observation | For progression/remission/recurrence |
| Treatment Response | Observation | Using RECIST or other standard criteria |

## Other Elements

| **European Cancer Model** | **FHIR Resource** | **Notes** |
| --- | --- | --- |
| Intent | Procedure.reasonCode / CarePlan.intent | To indicate curative vs palliative intent |
| Evidence | Observation / DocumentReference | Depends on evidence type |
| Trigger Event | Observation / Condition | For events triggering screening/diagnosis |
| Target Site | Procedure.bodySite | For anatomical target site of treatment |
| Ongoing Cycle Information | MedicationAdministration.dosage | For therapy cycles |

**Implementation Considerations**

1. **Extensions**: Many specific oncology concepts might require custom FHIR extensions
2. **Profiles**: Consider using specific FHIR profiles for oncology like mCODE (minimal Common Oncology Data Elements)
3. **Terminologies**: Use standard coding systems such as:
   * SNOMED CT for clinical conditions and procedures
   * LOINC for laboratory tests and observations
   * ICD-O for tumor morphology and topography
   * RxNorm for medications
4. **References**: Use references between resources to maintain the relationships from the original model

# European Cancer Model → Specific FHIR Profiles Mapping

Mapping with specific FHIR profiles, including oncology profiles like mCODE.

## Main Entities with Profiles

| **European Cancer Model** | **FHIR Profile/Resource** | **Notes** |
| --- | --- | --- |
| Patient | **mCODE CancerPatient** | Specific profile for oncology patients |
| Demographics | **Patient** (standard elements) | Included in CancerPatient profile |
| Comorbidities | **mCODE Comorbidities** | Specific profile for comorbidities |
| Cancer Condition | **mCODE PrimaryCancerCondition** / **SecondaryCancerCondition** | Depending on primary or secondary |
| Treatment | **mCODE CancerRelatedProcedure** / **CancerRelatedMedicationAdministration** | Specific profiles for oncology treatments |
| Treatment Plan | **CarePlan** with oncology extensions | May use national/regional profiles |

## Specific Procedures and Treatments

| **European Cancer Model** | **FHIR Profile** | **Notes** |
| --- | --- | --- |
| Surgery | **mCODE CancerRelatedSurgicalProcedure** | Includes tumor resection and related procedures |
| Radiotherapy | **mCODE RadiotherapyCourseSummary** | For complete radiotherapy course |
| Radiotherapy (single) | **mCODE RadiotherapyTreatmentPhase** | For specific treatment phases |
| Drug Administration | **mCODE CancerRelatedMedicationAdministration** | For chemotherapy and systemic therapies |
| Biopsy | **Procedure** + **mCODE HumanSpecimen** | Procedure + specimen with oncology details |
| Active Surveillance | **CarePlan** with specific category | No specific profile exists |
| Imaging | **ImagingStudy** + **mCODE TumorMarkerTest** | For imaging and related tumor markers |
| Lab | **mCODE CancerGeneticVariant** / **LabResultObservation** | For genetic or general tests |
| Biomarker | **mCODE TumorMarkerTest** | Specific profile for biomarkers |

## Oncology Clinical Elements with Profiles

| **European Cancer Model** | **FHIR Profile** | **Notes** |
| --- | --- | --- |
| Histology/Behaviour | **mCODE HistologyMorphologyBehavior** | Specific profile with ICD-O-3 |
| Body Site | Condition.bodySite with **mCODE BodyLocationExtension** | Extension for laterality |
| Tumor Grade | **mCODE CancerStageGroup** (component) | Can be part of staging |
| Cancer Stage | **mCODE TNMStageGroup** | Complete TNM staging |
| Clinical Stage | **mCODE TNMClinicalStageGroup** | Pre-treatment clinical staging |
| Pathological Stage | **mCODE TNMPathologicalStageGroup** | Post-surgical pathological staging |
| Disease Status | **mCODE CancerDiseaseStatus** | Specific states: progression, remission, etc. |
| Treatment Response | **mCODE TumorSize** / Observation with RECIST | For response assessment |

## Other Elements with Profiles

| **European Cancer Model** | **FHIR Profile** | **Notes** |
| --- | --- | --- |
| Intent | **mCODE TreatmentIntent** (extension) | Curative vs Palliative |
| Evidence | **DocumentReference** / **DiagnosticReport** | Standard FHIR with oncology references |
| Trigger Event | **Observation** with appropriate codes | For screening, symptoms, etc. |
| Target Site | **mCODE RadiotherapyVolume** | For radiotherapy volumes |
| Treatment Dose | **mCODE RadiotherapyDoseDeliveredToVolume** | Specific dose per volume |

## Additional Useful Profiles

1. **mCODE ECOG Performance Status**: For patient functional status
2. **mCODE Karnofsky Performance Status**: Alternative to ECOG
3. **mCODE GenomicVariant**: For genomic variants
4. **mCODE GenomicsReport**: For genomic test reports
5. **HL7 Genomics Reporting IG**: For advanced genomic reporting

## Implementation Considerations

1. **mCODE Version**: Use mCODE STU 3 or later
2. **National Profiles**: Check for national oncology profiles (e.g., IT-Oncology)
3. **Custom Extensions**: Some model relationships may require custom extensions
4. **Standard Terminologies**:
   * ICD-O-3 for morphology and topography
   * SNOMED CT for procedures and conditions
   * LOINC for laboratory tests
   * RxNorm/ATC for medications
   * UCUM for units of measure
5. **Bundles**: Consider using FHIR Bundles to group related resources (e.g., all data from a care episode)