*Microservice Specification for*

*“Consultation-Assessment or Diagnosis function”*

*AUTHORED by:*

*CHESTA SHARMA, KRISHAN BHARDWAJ, PRIYANKA YADAV*

*SUPPORTED by Dr AKRITI JAMWAL*



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1. **Functional Area – Consultation (A)**
   1. **Purpose**

This document describes the Functional and Technical Requirement Specification (BRS) for Consultation service in a primary and specialist care setting. Since consultation service is a complex functional area and comprises of multiple smaller service areas, we have divided it into smaller microservices. We have followed the SOAP note (Subjective, Objective, Assessment, Plan) method which is a worldwide adopted method of writing a clinical summary for a patient encounter. This document covers specifications for “Assessment” information which is captured by a Doctor/ Nurse during a patient consultation.

* 1. **Intended Audience**

This document is intended for the Product Engineering team to commence development of ‘Consultation (A)’ microservice and the audience would comprise of

* + - Development, Design & Implementation Team which may include Architects, Designers, Developers, and Business Analysts
    - Key stakeholders in the government at central and state levels
  1. **Overview**

In any clinical setting during a patient consultation, the healthcare provider (Doctor/ Nurse) captures patient’s critical health information which is required to arrive at the diagnosis and treatment plan for a patient. There are various ways or templates available for capturing such information. A SOAP (Subjective, Objective, Assessment & Plan) note in consultation is a way for healthcare professionals to document the information in a structured & organized way and is being used worldwide by the medical professionals. It also guides the professionals for evaluating information and provides a cognitive framework for clinical reasoning. The structure of documentation is a checklist with defined flow that serves as a cognitive aid and a potential index to capture and retrieve information about a patient’s health. It classifies the health information captured according to the source or type of information and facilitates clinical decision making.

The current document will cover only Assessment component of the SOAP note. The Assessment component is designed for the Doctor which is used by a Doctor to record a patient diagnosis. In general, a Doctor reviews patient’s history, presenting complaints, existing diagnosis and physical examination to arrive at a diagnosis.

There are a few critical components and related definitions a developer or an implementor should understand to develop the assessment functionality. Few of the definitions are provided below-

As already discussed above assessment segment of a SOAP structure is synonym to the “Diagnosis “segment most of the EHR/EMR applications provide. The details of the Diagnosis/Assessment section are provided in later part of the document.

**Scope & Not in Scope**

Functionality scope includes:

* Assessment part of the S-O-A-P style of recording medical information.
* Adding a new diagnosis
* Changing status of a diagnosis and
* Review active or preexisting diagnosis
  1. **Business Process Flow**
     + **Business Process Flow for Consultation (S+O)**

|  |  |
| --- | --- |
| **Description** | Assessment or Diagnosis section of a SOAP note/medical summary note is basically used for two main purposes-   1. **Record a new diagnosis for a patient** 2. **Review active/pre-existing Diagnosis**   Both the above use cases are very critical for a Doctor to arrive at patient specific treatment plan.  **Use Case**  If a patient visits a Doctor and his/her symptoms/test results indicates that the patient has “Dengue” and is also a Diabetic. The Doctor will not only record “Dengue” as a new diagnosis using the “Assessment “ or “Diagnosis” section but will also review a pre-existing condition or comorbidity which was recorded in patient’s previous visits, which will be seen in the same “Assessment” or “Diagnosis” section.  **Diagnosis Status**  **Note\*** *Updating diagnosis status or even updating a lab order with report review should be treated as an encounter and system shall create a new encounter ID for the same.*  A diagnosis to be recorded for a patient after reviewing his/her medical history can have multiple status, namely “Provisional, Final and Closed”   1. **Provisional Diagnosis**   A diagnosis that is recorded by the Doctor after reviewing symptoms, complaints, and patient medical history, that the patient is more likely to be suffering from , but still requires a confirmatory test to be done to be sure of the diagnosis is called a provisional diagnosis.   1. **Differential Diagnosis**   Number of problems or health conditions or diagnosis that might be responsible for the patient’s presenting or chief complaints. “The process of weighing the probability of one disease versus that of other diseases possibly accounting for a patient's illness.” It may involve multiple tests to be done to rule out the other possible diagnosis that were added by the treating doctor.  A doctor can add more than one diagnosis using the differential status and can add a list of probable diagnosis that might be causing the chief complaint or symptoms.  How it is different from provisional diagnosis is that a provisional diagnosis as explained above is more likely to be (But not 100%) the diagnosis patient might be suffering from and hence doctor won’t add multiple diagnosis for that visit for presenting complaints. While there can be multiple differential diagnosis that can be added for patient and each will require a physical and lab-based examination to rule out the unlikely diagnosis.   1. **Final Diagnosis**   A diagnosis that does not require a confirmatory test or investigations, for which symptoms, chief complaints, Doctor’s physical examination and patient’s history is enough to decide the condition patient is suffering from is marked as Final Diagnosis.  **Note\*:** Status of a provisional diagnosis can be updated to “final diagnosis” by the Doctor once confirmatory investigation’s results are updated or received in the next visit or encounter.  Whenever “status” of a diagnosis is changed by a user, system should maintain the audit log of the change with audit time, date and author.   1. **Closed Diagnosis**   Once an active diagnosis is cured or result of associated lab or radiology investigation indicates that patient has recovered and no more suffering from a recorded diagnosis, Doctor can close a diagnosis in patient’s next visits which can be just a investigation review or follow up visit.  Whenever the treating doctor changes status of a diagnosis to “close” the diagnosis should not be seen in the active diagnosis tab for future visits and should move to patient’s clinical history with onset and close data.  System should maintain an audit log internally for every diagnosis status change with provider details for accountability and to support medico legal use cases.  **Use Case**  A patient presents symptoms like sore throat, dry cough since last 3 days with a history of close contact with a COVID 19 patient in last 14 days, a doctor will record “COVID 19” as a provisional diagnosis until a confirmatory test like PCR is conducted and results are positive.  If the results are positive the doctor will change the diagnosis status from **“Provisional”** to **“Final”.**  Once patient is treated and the COVID test shows negative results, doctor can change the diagnosis status to **“Closed”.**  **Diagnosis priority**  Diagnosis priority primary and secondary can be used to indicate the importance of an active diagnosis with respect to the presenting complaint or current patient visit/encounter**.**   1. **Primary diagnosis:** It is the active condition for which a patient is complaining of and for which he is seeking consultation in the current encounter   For example, if the patient complains of fever and seeks consultation for the same, but at the same time is also a known diabetic. In such cases, fever is the primary diagnosis for the patient while diabetes is the secondary diagnosis which is equally important to be recorded for arriving at a patient specific treatment plan.   1. **Secondary diagnosis– Secondary** diagnosis are the conditions that coexists with the presenting complaint or diagnosisCo-morbidities (e.g. hypertension, diabetes, renal disorder etc.) can also be referred to as secondary diagnosis. For example, a patient complaint of fever and is also a diabetic then diabetes is the secondary diagnosis for the patient.   Recording a comorbidity is important because the treatment plan should also support management of patient’s comorbidities along with the management of primary diagnosis. |
| **Users** | Nurse, Doctor |
| **Pre-requisites** | The ‘Subjective’ and ‘Objective’ sections of the SOAP note is complete |
| **Business Process Details** | This section facilitates documentation of patient’s primary and secondary active diagnosis for a patient after reviewing “subjective- Presenting complaints, allergies, patient clinical history etc” and “objective- Physical examination, test results etc of the past” evidence to arrive at a diagnosis. This is the assessment of the patient’s status through analysis of the problem, possible interaction of the problems, and changes in the status of the problems.  This section involves a careful observation and analysis by the consulting doctor to not only record a diagnosis for the patient but also facilitates review or reconciliation of active secondary diagnosis (comorbidity) to arrive at a treatment plan. |
| **Steps** | * It is recommended that a clinical system should support ICD10/SNOMed codes for recording diagnosis for patients. * System can facilitate elastic/apache sonar search or lookup to pick a diagnosis from the application’s diagnosis master. * **Quick add**-The application should facilitate populating diagnosis as per doctor’s usage i.e recently recorded. It is a critical feature to support physician to enter a diagnosis faster by saving the search time. As every specialty may have some of the most common diagnosis and it becomes easier to record those without compromising doctor-patient face time. * **ICD/ SNOMeD mappings with local diagnosis codes**-In India standards like ICD and SNOMed are not often used and different health facilities have their own local diagnosis lists. While it is critical for the government to have coded diagnosis data to enable machine readable clinical condition for population health analysis and medical research. To enable adoption of such coding standards, applications should facilitate mappings for ICD/SNOMed in the backend with local diagnosis codes used by a facility until the clinicians get familiar with these international standards. This will help in change management and enable coded data for analysis * **Co-morbidity (Secondary diagnosis):** If there is an evidence of more than one active clinical conditions in the patient, the consulting doctor can record the preexisting condition or comorbidity using the same table and lookup for ICD10/SNOMeD-CT * Doctor can then mark the added diagnosis as a Primary or secondary. * The primary diagnosis will get added on to the list of active diagnoses (in case of multiple diagnosis) with onset date picked by the application. * In case the patient has come for a follow up visit, the consulting doctor will update the status (Provisional, Differential, Final) of the diagnosis as per the investigation results. * A doctor can also close an active diagnosis and the status for that diagnosis is marked as closed. Closed diagnosis is then automatically moved to patient’s history section.   **Reconciliation Function**  Active Diagnosis List   * All the past but active Diagnosis will also reflect on the Diagnosis page of the SOAP/encounter screen for reference. * A treating doctor can then change status or priority of an active diagnosis as per the scope of patient visit being recorded.   Past Diagnosis List   * All the closed diagnosis will automatically move to the Past diagnosis or patient history section and no longer will be available under the assessment/diagnosis section of a new encounter/consultation/SOAP screen.   **Note-** On closing a diagnosis an open episode for that diagnosis can be automatically closed in the application and a timeline view for all the encounters/visit under that episode should be available for the doctor to refer whenever required for future patient visit.  Application should support saving the diagnosis during an active encounter and let the doctor edit any information entered until the encounter summary/consultation record is submitted. Once the summary is submitted, doctor can no longer edit the details recorded for that visit.  Doctor can modify the status or priority of active diagnosis in future visits but will be marked as visit/encounter with edit details with the doctor’s name and will maintain last updated date and time details. |
| **Outputs** | None |
| **Messages & Alerts** | * System alert on missing information |

* 1. **Required MDDS Data Elements**
     + **Entity: Generic**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Elements** | **MDDS Codes** | **Data Format** | **Maximum Size** | **Code Directory** |
|  |  |  |  |  |
| Time | 05.001.0001 | HH:MM:SS | 8 |  |
| Date |  | dd/mm/yyyy | 10 | G00.01 |
| Alternate Identifier Type | 05.001.0003 | Integer | 2 | CD05.053 |
| Alternate Identifier | 05.001.0004 | Varchar | 254 |  |
| Alternate Identifier Format | 05.001.0005 | Bytes | 20 |  |
| Comments | 05.001.0007 | Varchar | 99 |  |
| Healthcare Application Number | 05.001.0019 | Integer | 5 | CD05.013 |
| Code System Qualifier Type | 05.001.0020 | Char | 1 |  |
| Code System Qualifier | 05.001.0021 | Varchar | 15 | CD05.032 |
| System of Medicine | 05.001.0022 | Integer | 2 | CD05.030 |
| Document ID | 05.001.0023 | Varchar | 50 |  |
| Reference Document ID | 05.001.0024 | Varchar | 50 |  |
| Non-Clinical Document Type | 05.001.0025 | Integer | 2 | CD05.034 |
| Reference Document | 05.001.0026 | Varchar | 254 |  |
| Non-Clinical Document | 05.001.0027 | Varchar | 4096 |  |

* + - **Entity: Person**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Elements** | **MDDS Codes** | **Data Format** | **Maximum Size** |  |
|  |  |  |  |  |
| Unique Health Identification Number | G01.01 | Integer | 12 |  |
| Alternate Unique Identification Number (UID) Type | 05.002.0001 | Integer | 2 | Refer to CD05.007 |
| Alternate Unique Identification Number (UID) | 05.002.0002 | Varchar | Max. Size =18 10 - PAN Card 08 - Passport No. 18 - Voter ID 18 - Any other Identifier |  |
| Time of Birth | 05.002.0003 | HH:MM:SS | 8 |  |
| Nationality Code | 05.002.0006 | Integer | 1 |  |
| Person Name Type | 05.002.0008 | Char | 1 |  |
| Author Name | 05.002.0017 |  |  | Refer to G01.02 |
| Author Landline Telephone Number | 05.002.0018 | Varchar | 8 | Refer to G00.06- 01-05 |
| Author Mobile number | 05.002.0019 | Char | 10 | Refer to G00.06- 02-05 |
| Author Email Address/URL | 05.002.0020 | Varchar | 254 | Refer to G00.09 |

* + - **Entity: Patient**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Elements** | **MDDS Codes** | **Data Format** | **Maximum size** | **Code Directory** |
|  |  |  |  |  |
| Provider’s Patient ID | 05.003.0001 | Varchar | 18 |  |
| Patient Name | 05.003.0002 |  |  | Refer to G01.02 |
| Reason for visit | 05.003.0016 | Varchar | 99 |  |

* + - **Entity: Facility**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Elements** | **MDDS Codes** | **Data Format** | **Maximum Size** | **Code Directory** |
|  |  |  |  |  |
| Unique Facility Identification Number | 05.008.0001 | Integer | 10 | Refer to CD05.001 |

* + - **Entity: Episode**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Elements** | **MDDS Codes** | **Data Format** | **Maximum Size** | **Code Directory** |
|  |  |  |  |  |
| Episode ID | 05.009.0001 | Varchar | 50 |  |
| Episode Type | 05.009.0002 | Integer | 1 |  |
| Episode From  Date | 05.009.0003 | dd/mm/yyyy | 10 | Refer to G00.01 |
| Episode End  Date | 05.009.0004 | dd/mm/yyyy | 10 | Refer to G00.01 |

* + - **Entity: Encounter**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Elements** | **MDDS Codes** | **Data Format** | **Maximum Size** | **Code Directory** |
|  |  |  |  |  |
| Encounter ID | 05.010.0001 | Varchar | 18 |  |
| Encounter Type | 05.010.0002 | Integer | 2 | Refer to CD05.047 |
| Encounter Type Description | 05.010.0003 | Varchar | 254 |  |
| Encounter Time | 05.010.0004 | HH:MM:SS | 8 |  |
| Encounter Date | 05.010.0005 | dd/mm/yyyy | 10 | Refer to G00.01 |

* + - **Entity: Diagnosis**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Elements** | **MDDS Codes** | **Data Format** | **Maximum Size** | **Code Directory** |
|  |  |  |  |  |
| Health Condition Type | 05.020.0001 | Integer | 3 | Refer to CD05.022 |
| Health Condition Name | 05.020.0002 | Varchar | 99 | Refer to CD05.019 |
| Health Condition Code | 05.020.0003 | Varchar | 10 | Refer to CD05.019 |
| Health Condition Description | 05.020.0004 | Varchar | 254 |  |
| Health Condition Category | 05.020.0005 | Char | 1 |  |
| Diagnosis Priority | 05.020.0006 | Integer | 1 |  |
| Health Condition Status | 05.020.0007 | Integer | 2 | Refer to CD05.021 |
| Comorbidity Indicator | 05.020.0008 | Integer | 1 |  |
| Comorbidity Code | 05.020.0009 | Varchar | 10 | Refer to CD05.019 |
| Present Health Condition Onset Date | 05.020.0010 |  |  | Refer to G00.01 |

**e- Encounter Note Object**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Data Elements Labels** | **FHIR Label** | **Cardinality** | **Field Type** | **Data Format String,Varchar,Integer,Value set** | **Maximum Size** | **Applicable code directory/value set** | **MDDS Label** | **Remark** |
| **Header (Encrypted and stored) This data will be machine readable and not viewed on the screen** | | | | | | | | |
| Unique Health Identification Number (UHID) | Patient.identifier | 1 | Mandatory | Integer | 12 |  | G01.01 | This will be generated once MOHFW builds the mater patient index for the country, as per NDHB we have to keep a place holder for the same. States can also build the state lever patient or citizen registry and can use that ID here and later can roll up to the central. |
| Alternate Unique Identification Number (UID) Type | Patient.identifier | 1 | Mandatory | Integer | 12 | CD05.007 | 05.002.0001 | Till the time the UHID is unavailable, patient alternate id can used in place of a unique identifier. For a hospital setting it can be the patient's AADHAR number. and for those enrolled in vertical programs, the IDs allotted to each patient under that program can be utilized for example, NIKSHAY ID. |
| Alternate Unique Identification Number (UID) Type | Patient.identifier | 1 | Mandatory | Varchar |  |  | 05.002.0002 |
| Facility Global Unique Identifier (GUID) | Patient.managingOrganization | 1 | Mandatory | Bits | 16 | CD05.001 | 05.008.0025 | Custodian of patient record or the object  Government is working on creating a National Facility Registry for all the healthcare facilities (Public and Private) and will generate unique facility IDs for each. This ID will come through that registry. For now states can use their own facility ID if they have at state level that identifies each facility uniquely in the state. (Required to be used for PMJAY |
| Unique Individual Health Care Provider Number | Practitioner.identifier | 1 | Mandatory | Varchar | 18 | CD05.008 | 05.005.0001 | Similarly, as per NDHB each healthcare provider like doctor, nurse etc will have a unique identifier that will be maintained Nationally in the provider registry. A placeholder for the same is required, till then medical council number or registration number of the doctor can be used here |
| Clinical Document Type Code | Composition.type | 1 | Mandatory | Integer | 2 | CD05.046 | 05.019.0006 | These will be backend values that will help to track all the clinical documents that will be generated by any application. |
| Document ID | Composition.identifier | 1 | Mandatory | Varchar | 50 |  | 05.001.0023 | This most of the application generates and store in their audit trail can just map with the MDDS code |
| Episode ID | EpisodeOfCare.identifier | 1 | Optional | Varchar | 50 |  | 05.009.0001 | Automatically generated by the system and NSF card should store this information for the encounter info they store |
| Episode Type | EpisodeOfCare.type | 1 | Optional | Integer | 1 | 1 - New 2 - Ongoing 3 - Active 4 - Inactive | 05.009.0002 |  |
| Episode Status | EpisodeOfCare.status | 1 | Mandatory |  |  | planned Waitlist Active On hold Finished Cancelled Entered in error |  |  |
| Encounter Date | Encounter.appointment | 1 | Optional | G00.01 |  |  | 05.010.0005 | Every time a new visit is created for consultation or any other service system automatically generates this to maintain the longitudinal record of a patient |
| Encounter ID | Encounter.identifier | 1 | Optional | Varchar | 18 |  | 05.010.0001 |
| **Title To be printed** | | | | | | | | |
| Unique Health Identification Number (UHID) | Patient.identifier | 1 | Optional | Integer | 12 | G01.01 |  | Nationally (State level) maintained patient's health ID |
| Hospital's Patient ID | Condition.subject | 1 | Optional | Varchar | 18 |  | 05.003.0001 | Local Registration ID of the facility |
| Patient Name | Patient.name | 1 | Optional |  |  | G01.02 | 05.003.0002 | Retrievable fields |
| Patient Age | Patient.birthDate | 1 | Optional | Age-year(s) (yyy) Integer(3) Age-Month(s) (mm) Integer(2) Age-Day(s) (dd) Integer (2) Default Value: 999,99,99 no preceding zero [years, months, days] | 7 |  | 05.003.0003 |
| Patient Gender | Patient.gender | 1 | Optional | Char | 1 | G01.03 |  |
| Patient Class | Encounter.class | 1 | Mandatory | Integer | 2 | CD05.047 | 05.003.0013 |
| Unique Individual Health Care Provider Number | Practitioner.identifier | 1 | Mandatory | Varchar | 18 |  | 05.005.0001 | **Auto captures as per the user log in** |
| **Patient Address (05.003.0009)** | | | | | | | | |
| Patient Address Type | Address.use | 1 | Optional | Char | 1 | CD05.120 | 05.003.0010 | **Retrievable fields** |
| Premises Identifier | Address.line | 1 | Optional | Varchar | 60 |  | G02.03-00-02 |
| Sub Locality-1 | Address.line | 1 | Optional | Varchar | 50 |  | G02.03-01-03 |
| Locality | Address.line | 1 | Optional | Varchar | 50 |  | G02.03-03-03 |
| Land Region code | Address.country | 1 | Optional | Integer | State - 2 District - 3 Sub-District - 5 Village - 6 Town - 6 |  | G02.01 |
| District | Address.district | 1 | Optional | Integer | 3 | CD02.03 | G02.01 |
| Sub-District | Address.line | 1 | Optional | Integer | 5 | CD02.04 | G02.02-01 |
| Village | Address.line | 1 | Optional | Integer | 6 |  | G02.01 |
| Town | Address.city | 1 | Optional | Integer |  | CD02.06 |  |
| State | Address.state | 1 | Optional | Integer | 2 | CD02.02 |  |
| Pin | Address.postalCode | 1 | Optional | Integer | 6 |  | G02.04-01 |
| Name of a Land region in English | Address.country | 1 | Optional | Varchar | 50 |  | G02.02-01 |
| Patient's email Address | Patient.telecom | 1 | Optional | Refer to Email (G00.09) |  |  | G00.09 |
| Patient Mobile Number | Patient.telecom | 1 | Optional | Char | 10 |  | 05.003.0012 |
| **Subjective Information** | | | | | | | | |
| **Family History** | | | | | | | | |
| Family Member Medical History | FamilyMemberHistory | 0....many | Mandatory | Varchar | 4096 | CD05.046 | 05.002.0024 |  |
| Family Member UID number | FamilyMemberHistory.identifier/ Condition.subject | 0..many | Optional | G01.01 |  |  | 05.002.0025 |  |
| Family Member Relationship | FamilyMemberHistory.relationship | 1 | Mandatory | G01.08-01 |  |  | 05.002.0027 |  |
| Health Condition Code (Family Member) | FamilyMemberHistory.condition.code | 0 to many | Mandatory | Varchar | 10 | ICD10/snomed/ICD11 | 05.020.0003 | Record only there is an active condition or a notifiable or NCD history |
| Health Condition status | FamilyMemberHistory.condition.outcome | 1 | Mandatory |  |  | CD05.021 | 05.020.0007 |  |
| **Patient's Clinical History** | | | | | | | | |
| Existing/comorbidity Health Condition Code | Condition.code | 0 to many | Mandatory | Varchar | 10 | ICD10/11/SNOMED | 05.020.0003 |  |
| Health Condition status | Condition.clinicalStatus | 1 | Mandatory |  |  | CD05.021 | 05.020.0007 | For the next encounter all the cured and closed diagnosis will be shown here with a logic built by the healthcare facility (eg: till what date a closed diagnosis should be shown) |
| Past Health Condition Onset Date | Condition.onset[x] | 1 | Optional | Refer to Date (G00.01) | 8 |  | NA |  |
| **Chief Complaints** | | | | | | | | |
| Chief Complaint ID | Condition.identifier | 0 to many | Mandatory | Varchar |  |  | NA | Can have more than 1 cardinality) |
| Chief Complaint Name | EpisodeOfCare.diagnosis.role | o to many | Mandatory | Varchar |  | ICD 10 (Signs & Symptoms) | NA |  |
| Body Site | Condition.bodySite | 1 | Mandatory | Integer | 2 | CD05.026 | 05.023.0007 |  |
| Duration | Condition.abatement[x] | 1 | Mandatory | Integer |  |  | NA |  |
| **Patient Allergies** | | | | | | | | |
| Allergy Product Code | AllergyIntolerance.code | 0 to many | Mandatory | Integer | 5 | CD05.018 | 05.018.0001 | This information is collected during the first consultation, but treating doctor can add more allergies if reported by the patient or through an adverse event reported by the hospital in future. |
| Allergy Product Description | AllergyIntolerance.reaction.substance | 0 to many | Mandatory | Varchar | 99 |  | 05.018.0002 |
| Allergy Status | AllergyIntolerance.clinicalStatus | 0 to many | Mandatory | Integer | 2 | CD05.021 | 05.018.0008 |
| Author Time | AllergyIntolerance.onset[x] | 1 | Optional | HH:MM:SS | 8 |  | 05.019.0001 | To be maintained internally |
| Author Date | AllergyIntolerance.onset[x] | 1 | Optional | Refer to Date (G00.01) |  |  | 05.019.0002 |
| Author ID | AllergyIntolerance.asserter | 1 | Mandatory | Varchar | 18 |  | 05.002.0032 | Code of the Author who has authored the clinical information that need to be exchanged. E.g. provider who has authored patient discharge summary or referral notes. |
| **Observations** | | | | | | | | |
| **Vitals https://www.hl7.org/fhir/observation-vitalsigns.html** | | | | | | | | |
| Vital Sign Result Time | Observation.effective[x] | 0 to many | Optional | HH:MM:SS | 8 |  | 05.017.0001 |  |
| Vital Sign Result Type | Observation.category | 0 to many | Optional | Integer | 2 | CD05.038/ https://www.hl7.org/fhir/observation-vitalsigns.html/ | 05.017.0002 |  |
| Vital Signs Result Status | Observation.status | 0 to many | Mandatory | Integer | 2 | CD05.038 | 05.017.0003 | Can be configured as per the specialty or clinical problem an application is trying to solve. A facility or department can decide which vitals they would like to capture. The vital parameters are provided in the associated code directory which is provided in another excel in this folder.    Each vital parameter will have cardinality 1, and is captured in every encounter. |
| Vital Sign Result Value | Observation.value[x] | 0 to many | Optional | Varchar | 20 |  | 05.017.0004 |
| Vital Sign Result Unit | Observation.value[x] | 0 to many |  | Integer | 2 | CD05.025 | 05.017.0005 |
| Vital Sign Result Interpretation | Observation.interpretation | 0 to many | Optional | Integer | 2 | CD05.135 | 05.017.0006 |
| Vital Sign Result Reference Range - lower limit | Observation.interpretation | 0 to many | Optional | Integer | 3 | CD05.039 | 05.017.0007 |
| Vital Sign Result Reference Range - Upper limit | Observation.referenceRange.high | 0 to many | Optional | Integer | 3 | CD05.039 | 05.017.0008 |
| Vital Sign Result Date | Observation.issued | 0 to many | Optional | Refer to Date (G00.01) |  |  | 05.017.0009 |
| Vital Sign Result ID | Observation.identifier | 0 to many | Optional | Integer | 2 |  | 05.017.0010 |
| **Examination** | | | | | | | | |
| Examination Type | Observation.category | 0 to many | Optional | Integer | 3 | CD05.061 | 05.016.0001 | There will be specific templates for each Type as per the medical speciality. |
| Examination Finding | Observation.code | 0 to many | Mandatory | Varchar | 4096 |  | 05.016.0002 |
| Examined System | BodyStructure.location | 0 to many | Optional | Integer | 2 | CD05.033 | 05.016.0003 |
| **Assessment** | | | | | | | | |
| **Diagnosis** | | | | | | | | |
| Health Condition Type | Condition.code | 1 to many | Mandatory | Integer | 2 | CD05.022 | 05.020.0001 |  |
| Health Condition name | Condition.code | 1 to many | Mandatory | Varchar | 9 | CD05.019 | 05.020.0002 |  |
| Health Condition Code | Condition.code | 1 to many | Mandatory | Varchar | 10 | CD05.019/ ICD10/SNOMeD | 05.020.0003 | Diagnosis ID |
| Health Condition Description | Condition.note | 1 to many | Optional | Varchar | 254 |  | 05.020.0004 |  |
| Health Condition Category | Condition.category | 1 to many | Optional | Char | 1 |  | 05.020.0005 |  |
| Diagnosis Priority | Condition.severity | 1 to many | Optional | Integer | 1 |  | 05.020.0006 |  |
| Present Health Condition Onset Date | Condition.onset[x] | 1 to many | Optional | Refer to Date (G00.01) |  |  | 05.020.0010 | Auto captures date of entry |
| Health Condition Status | Condition.clinicalStatus | 1 to many | Optional | Integer | 2 | CD05.021 | 05.020.0007 | System should facilitate closure of a cured condition |
| Comorbidity Indicator | EpisodeOfCare.diagnosis.role | 1 to many | Optional | Integer | 1 |  | 05.020.0008 |  |
| Comorbidity Health Condition Code | CarePlan.supportingInfo | 1 to many | Optional | Varchar | 10 | ICD 10/SNOMeD | 05.020.0009 |  |
| **Plan (Orders)** | | | | | | | | |
| **Order Info (Applicable for all orders)** | | | | | | | | |
| Order Date | CarePlan.created | 1 | Optional | Refer to Date (G00.01) |  |  | 05.023.0013 |  |
| Order Time | CarePlan.period | 1 |  | HH:MM:SS |  |  | 05.023.0014 |  |
| Order Group ID | CarePlan.identifier | 1 | Optional | Varchar | 10 |  | 05.025.0007 | Applicable for composite orders or order set (since order sets are used in janta clinic flow) example annual health and wellness check up |
| Order ID | CarePlan.identifier | 1 | Optional | Varchar | 12 |  | 05.025.0004 |  |
| Order Status | CarePlan.status | 1 | Mandatory | Char | 2 |  | 05.025.0008 |  |
| **Treatment Plan details (If applicable)** | | | | | | | | |
| Treatment plan ID /Package ID/ (Primary) | CarePlan.activity | 0 to many | Optional | Integer | 5 |  | 05.007.0038 | Once we have standard treatment guidelines those can be used or the facility may have defined their own set of treatment plan Note: Until STGs arrives we can use package IDs for insurance beneficiary (With cardinality if there are more than one package applicable in case of multiple surgeries during the same patient stay or episode (two open episodes) |
| **Lab Investigations** | | | | | | | | |
| Lab Order Code | DiagnosticReport.code | 0 to many | Mandatory | Varchar | 10 | CD05.024/LOINC | 05.021.0022 |  |
| Lab Order Description | DiagnosticReport.category | 0 to many | Optional | Varchar | 50 |  | NA |  |
| Lab Result ID | DiagnosticReport.result | 0 to many | Optional | Varchar | 10 |  | 05.021.0025 | These values will be visible only when there is a follow up visit for result awaited or a follow up visit for the same episode |
| Result Status | DiagnosticReport.status | 0 to many | Mandatory | Char | 2 |  | 05.021.0004 |
| Result Value | DiagnosticReport.presentedForm | 0 to many | Optional | Varchar | 20 |  | 05.021.0005 |
| Result Interpretation | DiagnosticReport.conclusion | 0 to many | Optional | Integer | 2 |  | 05.021.0006 |
| Result Reference Range - lower limit | Observation.referenceRange.low | 0 to many | Optional | Integer | 7 | CD05.039 | 05.021.0007 |
| Result Reference Range - Upper limit | Observation.referenceRange.high | 0 to many | Optional | Integer | 7 | CD05.039 | 05.021.0008 |
| **Radiology Investigations** | | | | | | | | |
| Radiology Procedure Code | Procedure.code | 0 to many | Optional | Varchar | 18 | CD05.043 | 05.022.0008 |  |
| Radiology Procedure Name | Procedure.code | 0 to many | Optional | Varchar | 255 | CD05.043 | 05.022.0007 |  |
| Radiology Result Status | DiagnosticReport.status | 0 to many | Mandatory | Integer | 2 | CD05.038 | 05.022.0009 | Applicable to follow up visit |
| Radiology Result ID | DiagnosticReport.identifier | 0 to many | Optional | Varchar | 10 |  | 05.022.0010 |
| scanned report attachment |  | 0 to many |  |  |  |  |  |  |
| **Non-radiology Procedure Orders** | | | | | | | | |
| Procedure Code | Procedure.code | 0 to many | Mandatory | Varchar | 10 | CD05.043 | 05.026.0003 | If applicable |
| Procedure Name | Procedure.code | 0 to many | Optional | Varchar | 255 | CD05.043 | 05.026.0001 |
| **Rx Orders** | | | | | | | | |
| Prescription ID | MedicationRequest.identifier | 1 | Mandatory | Varchar | 20 |  | 05.023.0012 |  |
| Generic Drug Code | MedicationKnowledge.code | 0 to many | Mandatory | Integer | 5 | CD05.104 | 05.031.0004 |  |
| Brand Drug Code | Medication.code | 0 to many | Optional | Integer | 10 | CD05.105 | 05.031.0006 |  |
| Brand Drug Name | Medication.identifier | 0 to many | Mandatory | Varchar | 99 | CD05.105 | 05.031.0005 |  |
| Strength Value | Medication.ingredient.strength | 0 to many | Optional | Varchar | 25 |  | 05.031.0011 |  |
| Route of Administration | MedicationAdministration.dosage.route | 0 to many | Optional | Varchar | 6 | CD05.111 | 05.023.0002 |  |
| Medication Frequency | MedicationAdministration.dosage.rate[x] | 0 to many | Optional | Varchar | 5 | CD05.023 | 05.023.0003 |  |
| Medication Administration Interval | MedicationAdministration.dosage.rate[x] | 0 to many | Optional | Varchar | 40 |  | 05.023.0004 |  |
| Dose | MedicationAdministration.dosage | 0 to many | Optional | Varchar | 60 |  | 05.023.0005 |  |
| Medication Stopped Indicator | MedicationStatement.status | 0 to many | Mandatory | Integer | 1 |  |  |  |
| Medication Status | Medication.status | 0 to many | Optional | Integer | 2 | CD05.123 | 05.023.0010 |  |
| Medication Fills | MedicationRequest.dispenseRequest.initialFill | 0 to many | Optional | Integer | 3 |  | 05.023.0019 |  |
| Medication Fill No. | MedicationRequest.dispenseRequest.numberOfRepeatsAllowed | 0 to many | Optional |  |  |  | NA |  |
| Quantity Ordered Value | MedicationDispense.quantity | 0 to many | Optional | Integer | 10 |  | 05.023.0020 |  |
| Pharmacy Units | MedicationDispense.quantity | 0 to many | Optional | Varchar | 25 | CD05.109 | 05.023.0021 |  |
| **Immunization Order (If applicable)** | | | | | | | | |
| Immunization Performer Identification Number | Immunization.performer | 0 to many | Optional | Varchar | 18 |  | 05.024.0004 |  |
| Immunization Product Code | Immunization.vaccineCode | 0 to many | Mandatory | Integer | 3 | CD05.036 | 05.024.0005 |  |
| Medication Series No. | Immunization.protocolApplied.seriesDoses[x] | 0 to many | Optional | Integer | 2 |  | 05.024.0003 |  |
| Immunization Administered Date | Immunization.occurrence[x] | 0 to many | Mandatory | G00.01 |  |  | 05.024.0008 |  |
| **Follow Up Order** | | | | | | | | |
| Follow Up Date | Appointment.start | 0 to many | Optional | G00.01 | 8 |  | NA |  |
| Follow up interval | Appointment.slot | 0 to many | Optional |  |  |  | NA |  |
| Patient Instruction | CarePlan.note | 0 to many | Optional | Free Text |  |  | NA |  |
| **Author Details** | | | | | | | | |
| Author Date | Composition.date | 1 | Mandatory | G00.01 |  |  | 05.019.0002 | Auto captured with role based access control/ Doctor's digital signature who created the encounter note |
| Author Time | Composition.attester.time | 1 | Optional | HH:MM:SS | 8 |  | 05.019.0001 |
| Author's Digital Signature | Signature.who | 1 | Mandatory |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

**Consultation Assessment Microservice – Technical Specification based on Microservice CQRS and Event Sourcing Architecture**

**Name – AssessmentConsultation Microservice**

**Domain Model**

**Aggregate Root**

ConsultationAssessment class

|  |  |  |
| --- | --- | --- |
| **S.No** | **Attributes (ConsultationAssessment Aggregate Root Class)** | **MDDS Mapping** |
| 1 | Assessment ID | Aggregate Identifier |
| 2 | episodeID | 05.009.0001 |
| 3 | encounterId | 05.010.0001 |
| 4 | providerPatientID | 05.003.0001 |
| 5 | uniqueFacilityIdentificationNumber | 05.008.0001 |
| 14 | List <Diagnosis> | Aggregate Member |

**Diagnosis Entity**

|  |  |  |
| --- | --- | --- |
| **S.No** | **Attributes (MedicationOrder Entity class)** | **MDDS Mapping** |
| 1 | DiagnosisID | entityId |
| 2 | DiagnosisType (Enum) | 05.020.0006 |
| 3 | DiagnosisCategory (Enum) | 05.020.0005 |
| 4 | DiagnosisStatus (Enum) | 05.020.0007 |
| 5 | DiagnosisCode | 05.020.0003 (Refer to CD05.019) |
| 6 | DiagnosisDescription | 05.020.0004 |
| 7 | LocalCode (Mapping with ICD10 or SNOMED) |  |
| 8 | Diagnosis Record Date |  |
| 9 | Comorbidity Indicator | 05.020.0008 |
| 10 | Present Health Condition Onset Date | 05.020.0010 |

**DiagnosisType (Enum) (refer to 05.020.0006 (MDDS Code directory)**

Primary

Secondary

**DiagnosisCategory (Enum) ) (refer to 05.020.0005 (MDDS Code directory)**

P (Presumptive or Provisional)

S (Suspected)

L (Lab confirmed or Final)

C (Clinically confirmed)

**DiagnosisStatus (Enum) ) (refer to 05.020.0007 (MDDS Code directory)**

Active

Inactive

Closed

Resolved

Relapsed

Remitted

**REST API Specification (Restful Web service APIs)**

**getPatientDiagnosisDetailsByEpisodeID**

Method Type– POST

Request parameter – episodeID

Response – List of Consultation Assessment Aggregate Root Model/DTO Objects

(This will be a paginated response as it covers diagnosis details across all the visits for a given Issue (Episode)

**getPatientDiagnosisByEncounterID**

Method Type– POST

Request parameter – encounterId

Response –Consultation Assessment Aggregate Root Model /DTO Objects (covers the diagnosis detail registered by careprovider during a patient visit at care provider facility)

**getPatientDiagnosisByDate**

Method Type– POST

Request parameter – providerPatientId, uniqueFacilityIdentificationNumber, DiagnosisRecordedDate

Response – Consultation Assessment Aggregate Root Model /DTO Objects (covers the diagnosis detail registered by careprovider during a patient visit at care provider facility)

**getPatientCurrentDiagnosis**

Method Type– POST

Request parameter – providerPatientId, uniqueFacilityIdentificationNumber,encounterId

Response –Consultation Assessment Aggregate Root Model /DTO Objects (covers the diagnosis details of a patient recorded by careprovider at the facility for current diagnosis)

**getPatientPreviousDiagnosis**

Method Type– POST

Request parameter – providerPatientId, uniqueFacilityIdentificationNumber,encounterId

Response – List of Consultation Assessment Aggregate Root Model /DTO Objects (covers the diagnosis details of a patient recorded by careprovider across multiple visits of patient for all previous visits)

if the facility is registered with NDHM sandbox and patient has voluntarily participated in consent manager based exchange by creating health ID , linking his care records across the facilities, this call will return the EHR view of patient diagnosis recorded across the facilities including previous diagnosis recorded at the facility,.

In case, uniqueFacilityIdentificationNumber is provided in Request Body , all previous diagnosis of patient recorded at that facility will be returned.

(this will be a paginated response)

**getPatientComorbidities**

Method Type– POST

Request parameter – providerPatientId, DiagnosisCategory (=Comorbidity), uniqueFacilityIdentificationNumber

Response – List of Consultation Assessment Aggregate Root Model /DTO Objects (covers the comorbidity details of a patient recorded by careprovider across multiple visits across the facilities)

if the facility is registered with NDHM sandbox and patient has voluntarily participated in consent manager based exchange by creating health ID , linking his care records across the facilities, this call will return the EHR view of patient comorbidities recorded across the facilities,.

In case, uniqueFacilityIdentificationNumber is provided in Request Body , all comorbidities of patient recorded at that facility will be returned.

(this will be a paginated response)

**createPatientConsultationAssessmentForAPatientVisit**

Method Type– POST

Request parameter

String encounterId

String providerPatientId

String UniqueFacilityIdentificationNumber  
List<Diagnosis> Diagnosis

Response – HTTP Status 201(created) , Assessment ID

This API creates the patient consultation assessment with single or multiple diagnosis recorded for patient at a facility. The diagnosis code will be ICD10/SNOMED code or Facility local code for diagnosis.

**updatePatientConsultationAssessmentForAPatientVisit[**

Method Type– POST

Request parameter

String assessmentID

String encounterId

String providerPatientId

String UniqueFacilityIdentificationNumber  
List<Diagnosis> Diagnosis

Response – HTTP Status 200 (ok)

This API updates the patient consultation assessment with single or multiple diagnosis recorded for patient at a facility. The API will be called to update the existing assessment details of a patient (in scenarios like adding additional diagnosis, changing diagnosis priority, type or status of diagnosis (e.g. closing the diagnosis) etc. for an active encounter. Once the encounter is closed, this API will not make any updation of patient diagnosis list.

**Commands**

**Patient Consultation Assessment Microservice will be capable of handling following types of commands**

**(All request and response parameters should be encapsulated as Data Transfer Objects)**

**1. CreatePatientConsultationAssessmentCommand**

**parameters** -

String AssessmentId

String episodeId

String encounterId

String providerPatientId

String facilityIdentificationNumber

List<Diagnosis> Diagnosis

(Diagnosis Entity encapsulate the diagnosis detail.)

Mode - Synchronous

**2. UpdatePatientConsultationAssessmentCommand**

**parameters –**

String AssessmentId

String episodeId

String encounterId

String providerPatientId

String facilityIdentificationNumber

List<Diagnosis> Diagnosis

(Diagnosis Entity encapsulates the diagnosis detail.)

Mode – Synchronous

**3. CreatePatientDiagnosisCommand**

**parameters –**

String diagnosisId

String encounterId

String providerPatientId

Date diagnosisRecordedDate

DiagnosisTypeEnum diagnosisType

DiagnosisCategoryEnum diagnosisCategory  
DiagnosisStatusEnum diagnosisStatus

String diagnosisCode (ICD10 or SNOMED-CT Code)

String diagnosisdescription

String diagnosislocalcode

String UniqueFacilityIdentificationNumber

Mode – Synchronous

**4. updatePatientDiagnosisCommand**

**parameters –**

String diagnosisId

String encounterId

String providerPatientId

Date diagnosisRecordedDate

DiagnosisTypeEnum diagnosisType

DiagnosisCategoryEnum diagnosisCategory  
DiagnosisStatusEnum diagnosisStatus

String diagnosisCode (ICD10 or SNOMED-CT Code)

String diagnosisdescription

String diagnosislocalcode

String UniqueFacilityIdentificationNumber

**Events Published**

**Channel – Patient ConsultationAssessment event channel**

**Patient Consultation Assessment Microservice will be capable of handling following types of Events**

1. **PatientConsultationAssessmentCreatedEvent**

Data structure of PatientConsultationAssessmentCreatedEvent object

String AssessmentId

String episodeId

String encounterId

String providerPatientId

String facilityIdentificationNumber

List<Diagnosis> Diagnosis

1. **PatientConsultationAssessmentUpdatedEvent**

Data structure of PatientConsultationAssessmentUpdatedEvent object

String AssessmentId

String episodeId

String encounterId

String providerPatientId

String facilityIdentificationNumber

List<Diagnosis> Diagnosis

1. **PatientDiagnosisCreatedEvent**

Data structure of PatientDiagnosisCreatedEvent object

String diagnosisId

String encounterId

String providerPatientId

Date diagnosisRecordedDate

DiagnosisTypeEnum diagnosisType

DiagnosisCategoryEnum diagnosisCategory  
DiagnosisStatusEnum diagnosisStatus

String diagnosisCode (ICD10 or SNOMED-CT Code)

String diagnosisdescription

String diagnosislocalcode

String UniqueFacilityIdentificationNumber

1. **PatientDiagnosisUpdatedEvent**

Data structure of PatientDiagnosisUpdatedEvent object

String diagnosisId

String encounterId

String providerPatientId

Date diagnosisRecordedDate

DiagnosisTypeEnum diagnosisType

DiagnosisCategoryEnum diagnosisCategory  
DiagnosisStatusEnum diagnosisStatus

String diagnosisCode (ICD10 or SNOMED-CT Code)

String diagnosisdescription

String diagnosislocalcode

String UniqueFacilityIdentificationNumber

**Queries**

**The Consultation Assessment service will be capable of handling different types of Queries:**

1. **getConsultationAssessmentByEncounterId**

Parameter - encounterId

1. **getPatientActiveDiagnosis**

Parameter – provider patient id, uniquefacilityidentificationnumber, encounterId

1. **getPatientPreviousDiagnosis**

Parameter –PatientID, uniquefacilityidentificationnumber, encounterId

(this is a paginated query)

4 **getPatientComorbidities**

Parameter –PatientID, uniquefacilityidentificationnumber, diagnosisCategory=comorbidity

(this is a paginated query)

5 g**etPatientDiagnosisByDateRange**

Parameter –PatientID, uniquefacilityidentificationnumber, startdate, enddate

(this is a paginated query will be used to create timeline view of patient multiple visits within a date range)

6 **getPatientAssessmentDetailByDiagnosisId**

Parameter –PatientID, DiagnosisId

**Dependencies**

|  |  |
| --- | --- |
| **Invokes** | **Subscribes To** |
| Patient Registration Microservice  **getPatientByFacilityAssignedTemporaryRegistrationNumber()**  Visit Microservice  **getPatientVisitByEncounterId()**  **Consultation Subjective Microservice**  **getPatientSubjectiveConsultationByEncounterID()**  **Consultation Objective Microservice**  **getPatientObjectiveConsultationByEncounterID()** | Viisit Microservice  **EncounterCheckedIn Event**  **ConsultationSubjectiveCreated**  Consultation Subjective Microservice (for accessing patient chief complaints, history etc.)  **ConsultationObjectiveCreated**  Consultation Objective Microservice (for accessing vital signs, examination details etc)  Result Microservice (TBD)  **InvestigationResultsAvailableEvent (TBD)**  **T**his event will publish details about Investigation results (for plan orders given in previous visits) and will update the diagnosis detail (e.g change status of diagnosis from provisional to final based on investigation results - It will be automatic in case of lab result change triggering diagnosis update and manual in all other cases where doctor access the lab results and update diagnosis manually.)  Billing Microservice (TBD)  **Billing Performed Event (for post episodic billing scenario)** |