Assignment #4 - HL7 V2.5 TO FHIR Mapping

We have this immunization message in HL7 V2.5 from the Maine immunization registry.
Colors are only used to differentiate the lines.

```
MSH|^~\&|MyEMR|DE-000001| |IMMPACT|20160701123030-
0700||VXU^V04^VXU_V04|CA0001|P|2.5.1|||ER|AL|||||Z22^CDCPHINVS|DE-000
001
PID|1||PA123456^^^MYEMR^MR||JONES^GEORGE^M^JR^^^L|MILLER^MARTHA^G^^^^
M|20140227|M||21 06-3^WHITE^CDCREC|1234 W FIRST
ST^^AUGUSTA^ME^04330^^H||^PRN^PH^^^207^5555555||ENG^English^HL70296||
|||||2186-5^ not Hispanic or Latino^CDCREC||Y|2
PD1|||||||||||02^REMINDER/RECALL - ANY
METHOD^HL70215|N|20140730|||A|20140730|
NK1|1|JONES^MARTHA^^^^^L|MTH^MOTHER^HL70063|1234 W FIRST ST^^AUGUSTA
^ME^04330^^H|^PRN^PH^^^207^5555555|
ORC|RE||197023^CMC|||||||^Clark^Dave||^Smith^Janet^^^^^^^L^^^^^^^^^^^
MD |||||
RXA|0|1|20140730||08^HEPB-PEDIATRIC/ADOLESCENT^CVX|.5|mL^mL^UCUM||00^
NEW IMMUNIZATION
RECORD^NIP001|1245319599^Smith^Janet^^^^^CMS^^^^NPI^^^^^^^MD
|^^^DE- 000001|||0039F|20200531|MSD^MERCK^MVX|||CP|A
RXR|C28161^INTRAMUSCULAR^NCIT|LA^LEFT ARM^HL70163
OBX|1|CE|64994-7^Vaccine funding program eligibility
category^LN|1|V03^VFC eligibility -Not
Insured^HL70064|||||F|||20110701140500
```

You can copy the message and paste it in
https://www.hl7inspector.com/
Clicking in any segment / field (segment are lines, fields are separated by | - pipes) you can see the description of the content

The implementation guide is available from here:
https://www.maine.gov/dhhs/mecdc/infectious-disease/immunization/documents/ImmPact-HL7v2.5.1DataExchangeSpecs-v0.3-ME-9.2020.pdf

Our organization needed to transform the immunization
messages into FHIR to feed a clinical decision support system.

One of the big consultancy companies (in fact, one of the big 7)
sent a 18yo trainee who after three months asking questions and
writing notes in an ipad, finally asked ChatGPT to create a
template with the mapping from the HL7 V2.x message to a FHIR
Bundle, and a table with the mapping, to help the implementers.

The results are below:

Mapping Table

{{segment.field}}	Value in our example message	HL7 V2.x Description	Resource.Element in Bundle
{{MSH.3}}	MyEMR	Sending Application	MessageHeader.source.name
{{MSH.4}}	DE-000001	Sending Facility	MessageHeader.source.endpoint
{{MSH.5}}		Receiving Application	MessageHeader.destination.name
{{MSH.7}}	20160701123030-0700	Date/Time of Message	MessageHeader.timestamp
{{MSH.9}}	VXU^V04^VXU_V04	Message Type	MessageHeader.eventCoding.code
{{MSH.10}}	CA0001	Message Control ID	MessageHeader.id
{{PID.3}}	PA123456	Patient Identifier List	Patient.id
{{PID.3.4}}	MYEMR	Assigning Authority	Patient.identifier.system
{{PID.5.1}}	JONES	Patient Name - Family	Patient.name.family
{{PID.5.2}}	GEORGE	Patient Name - Given	Patient.name.given
{{PID.5.3}}	M	Patient Name - Middle	Patient.name.given

{{PID.5.4}}	JR	Patient Name - Suffix	Patient.name.suffix
{{PID.7}}	20140227	Date/Time of Birth	Patient.birthDate
{{PID.8}}	M	Administrative Sex	Patient.gender
{{PID.11.1}}	1234 W FIRST ST	Patient Address - Street	Patient.address.line
{{PID.11.3}}	AUGUSTA	Patient Address - City	Patient.address.city
{{PID.11.4}}	ME	Patient Address - State	Patient.address.state
{{PID.11.5}}	4330	Patient Address - Zip	Patient.address.postalCode
{{PID.13.1}}	2075555555	Phone Number - Home	Patient.telecom.value
{{PID.15.1}}	ENG	Primary Language Code	Patient.communication.language.coding.code
{{PID.15.2}}	English	Primary Language	Patient.communication.language.coding.display
{{RXA.3}}	20140730	Administration Date	Immunization.occurrenceDateTime
{{RXA.5}}	8	Administered Code	Immunization.vaccineCode.coding.code
{{RXA.5.2}}	HEPB-PEDIATRIC/ADOLESCENT	Administered Description	Immunization.vaccineCode.coding.display
{{RXA.10}}	1245319599	Administered By	Practitioner.id
{{RXA.10.2}}	Smith	Administered By - Family	Practitioner.name.family
{{RXA.10.3}}	Janet	Administered By - Given	Practitioner.name.given
{{RXA.10.14}}	MD	Administered By - Degree	Practitioner.qualification.identifier.value
{{RXA.15}}	0039F	Lot Number	Immunization.lotNumber
{{RXA.16}}	20200531	Expiration Date	Immunization.expirationDate
{{RXA.17}}	MSD	Manufacturer	Immunization.manufacturer.reference
{{RXR.1}}	C28161	Route of Administration	Immunization.route.coding.code
{{RXR.1.2}}	INTRAMUSCULAR	Route Description	Immunization.route.coding.display
{{RXR.2}}	LA	Site of Administration	Immunization.site.coding.code
{{RXR.2.2}}	LEFT ARM	Site Description	Immunization.site.coding.display

{{OBX.3}}	64994-7	Observation Identifier	Observation.code.coding.code
{{OBX.3.2}}	Vaccine funding program eligibility category	Observation Description	Observation.code.coding.display
{{OBX.5}}	V03	Observation Value	Observation.valueCodeableConcept.coding.code
{{OBX.5.2}}	VFC eligibility – Not Insured	Observation Value Description	Observation.valueCodeableConcept.coding.display
{{OBX.14}}	20110701140500	Observation Date/Time	Observation.effectiveDateTime

Template

```
{
 "resourceType": "Bundle",
 "type": "message",
 "entry": [
   {
     "resource": {
       "resourceType": "MessageHeader",
       "eventCoding": {
         "system": "http://hl7.org/fhir/message-events",
         "code": "{{MSH.9}}"
       },
       "source": {
         "name": "{{MSH.3}}",
         "endpoint": "urn:uuid:{{MSH.4}}"
       },
       "destination": [
         {
           "name": "{{MSH.5}}"
         }
```

```json
    ],
    "timestamp": "{{MSH.7}}",
    "enterer": {
      "reference": "Practitioner/{{RXA.10}}"
    }
  }
},
{
  "resource": {
    "resourceType": "Patient",
    "id": "{{PID.3}}",
    "identifier": [
      {
        "system": "urn:oid:{{PID.3.4}}",
        "value": "{{PID.3}}"
      }
    ],
    "name": [
      {
        "family": "{{PID.5.1}}",
        "given": ["{{PID.5.2}}", "{{PID.5.3}}"],
        "suffix": ["{{PID.5.4}}"]
      }
    ],
    "birthDate": "{{PID.7}}",
    "gender": "{{PID.8}}",
    "address": [
      {
        "line": ["{{PID.11.1}}"],
        "city": "{{PID.11.3}}",
        "state": "{{PID.11.4}}",
        "postalCode": "{{PID.11.5}}"
```

```json
        }
      ],
      "telecom": [
        {
          "system": "phone",
          "value": "{{PID.13.1}}",
          "use": "home"
        }
      ],
      "communication": [
        {
          "language": {
            "coding": [
              {
                "system": "urn:oid:2.16.840.1.113883.6.96",
                "code": "{{PID.15.1}}",
                "display": "{{PID.15.2}}"
              }
            ]
          }
        }
      ]
    }
  },
  {
    "resource": {
      "resourceType": "Practitioner",
      "id": "{{RXA.10}}",
      "identifier": [
        {
          "system": "urn:oid:2.16.840.1.113883.4.6",
          "value": "{{RXA.10}}"
```

```json
        }
      ],
      "name": [
        {
          "family": "{{RXA.10.2}}",
          "given": ["{{RXA.10.3}}"]
        }
      ],
      "qualification": [
        {
          "identifier": [
            {
              "system": "urn:oid:2.16.840.1.113883.4.6",
              "value": "{{RXA.10.14}}"
            }
          ]
        }
      ]
    }
  },
  {
    "resource": {
      "resourceType": "Immunization",
      "status": "completed",
      "vaccineCode": {
        "coding": [
          {
            "system": "http://hl7.org/fhir/sid/cvx",
            "code": "{{RXA.5}}",
            "display": "{{RXA.5.2}}"
          }
        ]
```

```json
        },
        "patient": {
          "reference": "Patient/{{PID.3}}"
        },
        "occurrenceDateTime": "{{RXA.3}}",
        "primarySource": true,
        "location": {
          "reference": "Location/{{MSH.4}}"}
        ,
        "lotNumber": "{{RXA.15}}",
        "expirationDate": "{{RXA.16}}",
        "site": {
          "coding": [
            {
              "system": "http://hl7.org/fhir/v3/ActSite",
              "code": "{{RXR.2}}",
              "display": "{{RXR.2.2}}"
            }
          ]
        },
        "route": {
          "coding": [
            {
              "system":
"http://hl7.org/fhir/v3/RouteOfAdministration",
              "code": "{{RXR.1}}",
              "display": "{{RXR.1.2}}"
            }
          ]
        }
      }
    },
```

```json
    {
      "resource": {
        "resourceType": "Observation",
        "status": "final",
        "code": {
          "coding": [
            {
              "system": "http://loinc.org",
              "code": "{{OBX.3}}",
              "display": "{{OBX.3.2}}"
            }
          ]
        },
        "valueCodeableConcept": {
          "coding": [
            {
              "system":
"http://terminology.hl7.org/CodeSystem/v2-0064",
              "code": "{{OBX.5}}",
              "display": "{{OBX.5.2}}"
            }
          ]
        },
        "effectiveDateTime": "{{OBX.14}}"
      }
    }
  ]
}
```

There is a standardized mapping defined in the V2-to-FHIR implementation guide here:

https://build.fhir.org/ig/HL7/v2-to-fhir/ConceptMap-message-vxu-v04-to-bundle.html

And you can paste the bundle in the Bundle Visualizer by ClinFHIR

https://clinfhir.com/bundleVisualizer.html

Your job is to describe some problems -not all of them, there are more- with the mapping created by our trainee (and ChatGPT)

This list of problems were found by an HL7 FHIR HL7 V2.x expert but he retired and is now living on a private island in the Caribbean. He faxed some handwritten notes.

From: The FHIR / HL7 V2. Expert

Ref: Your ChatGPT generated mapping

Hints

1. Review the gender

2. Something is wrong about the location

3. Review code systems and identifier.system?

4. Pay attention to the date/time formats

5. Take care of the internal bundled references

Yours truly, from my little home at Bermuda

John. H.L. Seven

Two days after leaving, he also recorded a message in our answering machine (we have one from the 90s): "Something happens with the manufacturer - I am sure it is in the original message. And there is a

fake element in the MessageHeader resource. Yes, please, another mojito"