

Gastroenterology: Hepatitis C Documentation Template

Documentation Template: Conceptual Structure

Contract: VA118-16-D-1008, Task Order (TO): VA-118-16-F-1008-0007, CLIN0005AH

Department of Veterans Affairs (VA)



**Knowledge Based Systems (KBS)
Office of Informatics and Information Governance (OIIG)
Clinical Decision Support (CDS)**

Publication date 06/06/2018

Version: 1.0

Gastroenterology: Hepatitis C Documentation Template: Documentation Template: Conceptual Structure

by Knowledge Based Systems (KBS), Office of Informatics and Information Governance (OIIG), and Clinical Decision Support (CDS)

Publication date 06/06/2018

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Preface

Table 1. Revision History

Date	Life Cycle Event
June 6, 2018	Published
June 6, 2018	Created
August 29, 2017	Pre-published
August 10, 2017	Created

Table 2. Clinical White Paper Contributors

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Table 3. Artifact Identifier

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	5adfc19e-51c4-5ec0-bbf6-dd6ca3ff9bc5	B43

Artifact Applicability

Table 4. Applicability Foci, Description and Codes

Focus	Description	Code System	Code	Value Set	Value Set Version
TargetUser	Primary Care physicians			N/A	N/A
TargetUser	Gastroenterologists			N/A	N/A
ClinicalVenue	Outpatient	SNOMED CT	33022008 Hospital-based outpatient department (environment)	N/A	N/A
ClinicalVenue	Medical Service			N/A	N/A
PatientAgeGroup	Adult patients	SNOMED CT	133936004 Adult (person)	N/A	N/A
PatientGender	All			N/A	N/A

Models

Table 5. Model References

Referenced Model	Description
urn:solor.io:anf-model:1.0	VA Analysis Normal Form Model

Chapter 1. External Data Definitions

Definitions

Table 1.1. PatientRace

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic
Annotation:
Codes: elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)]->(363702006 Has focus (attribute))->[302147001 Demographic history detail (observable entity)]->(363714003 Interprets (attribute))->[103579009 Race (observable entity)]]

Table 1.2. BMI

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic
Annotation:
Codes: elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)]->(363702006 Has focus (attribute))->[301331008 Finding of body mass index (finding)]]

Table 1.3. ChildTurcottePughClass

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic
Annotation:
Codes: elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)]->(363702006 Has focus (attribute))->[710065009 Child-Pugh score class A (finding)]]elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)]->(363702006 Has focus (attribute))->[710066005 Child-Pugh score class B (finding)]]elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)]->(363702006 Has focus (attribute))->[710067001 Child-Pugh score class C (finding)]]

Table 1.4. Encephalopathy

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic
Annotation:
Codes: elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)]->(363702006 Has focus (attribute))->[81308009 Disorder of brain (disorder)]]

Table 1.5. HepatocellularCarcinoma

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic
Annotation:
Codes: elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)]->(363702006 Has focus (attribute))->[109841003 Liver cell carcinoma (disorder)]]

Table 1.6. HepatitisCInfectionStatusOfTheAllograft

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic
Annotation:

Codes: elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[365865003 |Finding of Hepatitis C status (finding)]]

Table 1.7. LiverTransplantDate

Expression: type=elm:Query

Annotation:

Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)]elm:value[elm:Code]: [18027006 |Transplantation of liver (procedure)]

Table 1.8. CompleteBloodCountInLast12Months

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime

Annotation:

Codes: elm:element[elm:Code]: [26604007 |Complete blood count (procedure)]

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-12 Month))
high: elm:Today()

Table 1.9. WhiteBloodCountInLast12Month

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime

Annotation:

Codes: elm:element[elm:Code]: [767002 |White blood cell count (procedure)]

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-12 Month))
high: elm:Today()

Table 1.10. MeanCellVolumeInLast12Month

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime

Annotation:

Codes: elm:element[elm:Code]: [104133003 |Erythrocyte mean corpuscular volume determination (procedure)]

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-12 Month))
high: elm:Today()

Table 1.11. HemoglobinInLast12Month

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime

Annotation:

Codes: elm:element[elm:Code]: [441689006 |Measurement of total hemoglobin concentration (procedure)]

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-12 Month))

high: elm:Today()

Table 1.12. PlateletCountInLast12Month

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime

Annotation:

Codes: elm:element[elm:Code]: [[61928009 |Platelet count (procedure)]]

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-12 Month))

high: elm:Today()

Table 1.13. LiveUltrasoundInterpretation

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [[370851004 |Evaluation of diagnostic study results (procedure)] ->(363702006 |Has focus (attribute))->[105377009 |Ultrasonography of liver (procedure)]]

Table 1.14. LiverCTInterpretation

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [[370851004 |Evaluation of diagnostic study results (procedure)] ->(363702006 |Has focus (attribute))->[241549007 |Computed tomography of liver (procedure)]]

Table 1.15. LiverMRIInterpretation

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [[370851004 |Evaluation of diagnostic study results (procedure)] ->(363702006 |Has focus (attribute))->[241622002 |Magnetic resonance imaging of liver (procedure)]]

Table 1.16. FibroscanInterpretation

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [[370851004 |Evaluation of diagnostic study results (procedure)] ->(363702006 |Has focus (attribute))->[441491005 |Ultrasound elastography of liver (procedure)]]

Triggers

No trigger definitions are present.

Chapter 2. Expression Definitions

No expression definitions are present.

Chapter 3. Demographics

☐ prompt: Race/Ethnicity

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)]- ->(363702006 |Has focus (attribute))->[302147001 |Demographic history detail (observable entity)]- ->(363714003 |Interprets (attribute))->[103579009 |Race (observable entity)]

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)]- ->(363702006 |Has focus (attribute))->[302147001 |Demographic history detail (observable entity)]- ->(363714003 |Interprets (attribute))->[364699009 |Ethnic group (observable entity)]

response: Code (Single)

initialValue: PatientRace

☐ prompt: Body Mass Index (BMI) (kg/m²)

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[301331008 |Finding of body mass index (finding)]

response: Real (Single)

initialValue: BMI

☐ prompt: Date BMI determined

response: Timestamp (Single)

initialValue: elm:Property BMI

Chapter 4. Problem List

❖ Current Problem

prompt:

response: Code (Single)

Chapter 5. Medication List

Include both prescription and OTC medications

❖ Current Medication

prompt:

response: Code (Single)

Chapter 6. History of Present Illness

☐ Select all medications that patient has previously received as treatment for Hepatitis C

prompt:

re- Code (Multiple)

sponse:

re- EnumerationConstraint (List)

sponse

range:

item: NS3 Protease Inhibitor plus Peginterferon Alfa/Ribavirin([416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[714427003 |Hepatitis C virus NS3/4A protease inhibitor (product)])

item: NS5A Protease Inhibitor([416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[714013001 |Hepatitis C virus protein NS5A inhibitor (product)])

item: Peginterferon Alfa/Ribavirin([416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[410841001 |Ribavirin+interferon alpha-2b (product)])

item: Simeprevir/Sofosbuvir([416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[714169007 |Simeprevir + sofosbuvir (product)])

item: Sofosbuvir([416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[713645002 |Sofosbuvir (product)])

item: Sofosbuvir/Ribavirin with or without Peginterferon Alfa/Ribavirin([416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[713645002 |Sofosbuvir (product)] [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[35063004 |Product containing ribavirin (medicinal product)])

☐ Other medications or treatments?

☐ prompt: Other medications or treatments?

response: Boolean (Single)

responseBinding: Property ("OtherMedicationsOrTreatments")

☐ **Condition:**elm:Property

☐ prompt: Details

response: String (Single)

Chapter 7. Liver Complications or Extrahepatic Manifestations.

<input type="checkbox"/>	<p><input type="checkbox"/> prompt: Ascites due to liver failure response: Boolean (Single)</p>
<input type="checkbox"/>	<p><input type="checkbox"/> prompt: Cirrhosis response: Boolean (Single) responseBinding: Property ("Cirrhosis")</p>
<input type="checkbox"/>	<p>Condition:elm:Property</p> <p><input type="checkbox"/> prompt: Child Turcotte Pugh Class for this patient response: EntityName (Single) response range: EnumerationConstraint (List)</p> <p>item: A([a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[710065009 Child-Pugh score class A (finding)])</p> <p>item: B([a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[710066005 Child-Pugh score class B (finding)])</p> <p>item: C([a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[710067001 Child-Pugh score class C (finding)])</p> <p>initalValue: ChildTurcottePughClass</p>
<input type="checkbox"/>	<p><input type="checkbox"/> prompt: Encephalopathy itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[81308009 Disorder of brain (disorder)] response: Boolean (Single) initalValue: Encephalopathy</p>
<input type="checkbox"/>	<p><input type="checkbox"/> prompt: Hepatocellular Carcinoma itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[109841003 Liver cell carcinoma (disorder)] response: Boolean (Single) initalValue: HepatocellularCarcinoma</p>
<input type="checkbox"/>	<p><input type="checkbox"/> prompt: Liver Transplant itemCode: 18027006 Transplantation of liver (procedure) </p>

<input type="checkbox"/>	response: Boolean (Single) responseBinding: Property ("LiverTransplant") <input type="checkbox"/> Condition: elm:Property	
	<input type="checkbox"/> prompt: Date response: Timestamp (Single) initialValue: LiverTransplantDate <input type="checkbox"/> prompt: Hepatitis C Infection status of the allograft response: String (Single) initialValue: HepatitisCInfectionStatusOfTheAllograft	
<input type="checkbox"/>	<input type="checkbox"/> prompt: Other Liver Complications or Extrahepatic Manifestations response: Boolean (Single) <input type="checkbox"/> Condition: elm:Property	
	<input type="checkbox"/> prompt: Details response: String (Single)	

Chapter 8. Prior Lab Results

<input type="checkbox"/>	Condition: elm:Not (elm:Exists(CompleteBloodCountInLast12Months))
<input type="checkbox"/> Please prompt provider to order a new Complete Blood Count if this there are no results or the date is not within 1 year. prompt: Order Complete Blood Count? itemCode: 26604007 Complete blood count (procedure) response: Boolean (Single) responseBinding: Property ("OrderCompleteBloodCount")	
<input type="checkbox"/>	Condition: elm:Property
<input type="checkbox"/> actionSentence[type=elm:Instance, classType=anf:ClinicalStatement] statementType: Precoordinated Expression 385644000 Request- ed (qualifier value) topic: Precoordinated Expression 26604007 Complete blood count (procedure)	
<input type="checkbox"/>	Condition: elm:Exists (CompleteBloodCountInLast12Months)
<input type="checkbox"/> prompt: Complete Blood Count response: Boolean (Single) <input type="checkbox"/> prompt: Date response: Timestamp (Single) initialValue: elm:Property CompleteBloodCountInLast12Months <input type="checkbox"/> prompt: White Blood Cell Count (K/microliter) itemCode: 767002 White blood cell count (procedure) response: Real (Single) initialValue: WhiteBloodCountInLast12Month <input type="checkbox"/> prompt: Mean Cell Volume (femtoliters) response: Real (Single) initialValue: MeanCellVolumeInLast12Month <input type="checkbox"/> prompt: Hemoglobin (g/dL) itemCode: 441689006 Measurement of total hemoglobin concentration (procedure) response: Real (Single) initialValue: HemoglobinInLast12Month <input type="checkbox"/> prompt: Platelet Count (K/microliter) itemCode: 61928009 Platelet count (procedure) response: Real (Single) initialValue: PlateletCountInLast12Month	
<input type="checkbox"/>	Hepatic Function Panel
prompt: item- 26958001 Hepatic function panel (procedure) Code:	

re- Boolean (Single)
sponse:

☐

- ☐ prompt: Date
response: Timestamp (Single)
- ☐ prompt: Albumin (d/dL)
itemCode: 26758005 |Albumin measurement (procedure)|
response: Real (Single)
- ☐ prompt: Total Bilirubin (mg/dL)
itemCode: 359986008 |Bilirubin, total measurement (procedure)|
response: Real (Single)
- ☐ prompt: Alanine Aminotransferase (U/L)
itemCode: 34608000 |Alanine aminotransferase measurement (procedure)|
response: Real (Single)
- ☐ prompt: Aspartate Aminotransferase (U/L)
itemCode: 45896001 |Aspartate aminotransferase measurement (procedure)|
response: Real (Single)
- ☐ prompt: Alkaline Phosphatase (U/L)
itemCode: 88810008 |Alkaline phosphatase measurement (procedure)|
response: Real (Single)

☐ International Normalized Ratio

prompt:

item- 440685005 |Calculation of international normalized ratio (procedure)|

Code:

re- Boolean (Single)
sponse:

☐

- ☐ prompt: Date
response: Timestamp (Single)
- ☐ prompt: Results
response: Real (Single)

☐ Estimated Glomerular Filtration Rate

prompt:

item- 395680003 |Estimated creatine clearance (procedure)|

Code:

re- Boolean (Single)
sponse:

☐

- ☐ prompt: Date
response: Timestamp (Single)
- ☐ prompt: Results (mL/min per 1.73 m²)
response: Real (Single)

<input type="checkbox"/> Creatinine	
prompt:	
item- 70901006 Creatinine measurement (procedure)	
Code:	
re- Boolean (Single)	
sponse:	
<input type="checkbox"/>	<input type="checkbox"/> prompt: Date response: Timestamp (Single) <input type="checkbox"/> prompt: Results (mg/dL) response: Real (Single)
<input type="checkbox"/> HCV Viral Load [Quantitative HCV Ribonucleic Acid (RNA)]	
prompt:	
item- 395197008 Hepatitis C viral load (procedure)	
Code:	
re- Boolean (Single)	
sponse:	
<input type="checkbox"/>	<input type="checkbox"/> prompt: Date response: Timestamp (Single) <input type="checkbox"/> prompt: Results (IU/L) response: Real (Single)
<input type="checkbox"/> HCV Genotype	
prompt:	
item- 397662006 Hepatitis C virus genotype determination (procedure)	
Code:	
re- Boolean (Single)	
sponse:	
<input type="checkbox"/>	<input type="checkbox"/> prompt: Date response: Timestamp (Single) <input type="checkbox"/> prompt: Results response: SimpleCode (Single)
<input type="checkbox"/> HIV Test	
prompt:	
item- 165813002 Human immunodeficiency virus test (procedure)	
Code:	
re- Boolean (Single)	
sponse:	
<input type="checkbox"/>	<input type="checkbox"/> prompt: Date response: Timestamp (Single) <input type="checkbox"/> prompt: Results

	response: Boolean (Single)
--	----------------------------

☐ Hepatitis B Screen

prompt:

item- 314099008 |Hepatitis B screening test (procedure)|

Code:

re- Boolean (Single)

sponse:

<input type="checkbox"/>	<p><input type="checkbox"/> prompt: Date</p> <p>response: Timestamp (Single)</p> <p><input type="checkbox"/> prompt: HBsAg</p> <p>itemCode: 47758006 Hepatitis B surface antigen measurement (procedure) </p> <p>response: Boolean (Single)</p> <p><input type="checkbox"/> prompt: Anti-HBs</p> <p>itemCode: 65911000 Hepatitis B surface antibody measurement (procedure) </p> <p>response: Boolean (Single)</p> <p><input type="checkbox"/> prompt: Anti-HBc</p> <p>itemCode: 59582004 Hepatitis B core antibody measurement (procedure) </p> <p>response: Boolean (Single)</p>
--------------------------	---

Chapter 9. Imaging Results

☐ prompt: Liver Ultrasound Interpretation

response: String (Single)

initialValue: LiveUltrasoundInterpretation

☐ prompt: Liver Computed Tomography (CT) Interpretation

response: String (Single)

initialValue: LiverCTInterpretation

☐ prompt: Liver Magnetic Resonance Imaging (MRI) Interpretation

response: String (Single)

initialValue: LiverMRIInterpretation

☐ prompt: Fibroscan Interpretation

response: String (Single)

initialValue: FirbroscanInterpretation

Chapter 10. Tabular List

Terminology Service Request (TSR) Mappings

Table 10.1. Terminology Versions

Name	Identifier	Version
SNOMED CT	2.16.840.1.113883.6.96	United States Edition 20180301

Table 10.2. Terminology References

System	Code	Display Text ^a	References ^b
SNOMED CT	104133003 Erythrocyte mean corpuscular volume determination (procedure)	Precoordinated Expression	1
SNOMED CT	133936004 Adult (person)	Adult patients	1
SNOMED CT	165813002 Human immunodeficiency virus test (procedure)	Postcoordinated Expression	1
SNOMED CT	18027006 Transplantation of liver (procedure)	Precoordinated Expression	2
SNOMED CT	26604007 Complete blood count (procedure)	Precoordinated Expression	3
SNOMED CT	26758005 Albumin measurement (procedure)	Postcoordinated Expression	1
SNOMED CT	26958001 Hepatic function panel (procedure)	Postcoordinated Expression	1
SNOMED CT	314099008 Hepatitis B screening test (procedure)	Precoordinated Expression	1
SNOMED CT	33022008 Hospital-based outpatient department (environment)	Outpatient	1
SNOMED CT	34608000 Alanine aminotransferase measurement (procedure)	Postcoordinated Expression	1
SNOMED CT	359986008 Bilirubin, total measurement (procedure)	Postcoordinated Expression	1
SNOMED CT	385644000 Requested (qualifier value)	Precoordinated Expression	1
SNOMED CT	395197008 Hepatitis C viral load (procedure)	Postcoordinated Expression	1
SNOMED CT	395680003 Estimated creatinine clearance (procedure)	Postcoordinated Expression	1

System	Code	Display Text ^a	References ^b
SNOMED CT	397662006 Hepatitis C virus genotype determination (procedure)	Postcoordinated Expression	1
SNOMED CT	398166005 Performed (qualifier value)	Precoordinated Expression	1
SNOMED CT	440685005 Calculation of international normalized ratio (procedure)	Postcoordinated Expression	1
SNOMED CT	441689006 Measurement of total hemoglobin concentration (procedure)	Precoordinated Expression	2
SNOMED CT	45896001 Aspartate aminotransferase measurement (procedure)	Postcoordinated Expression	1
SNOMED CT	47758006 Hepatitis B surface antigen measurement (procedure)	Precoordinated Expression	1
SNOMED CT	59582004 Hepatitis B core antibody measurement (procedure)	Precoordinated Expression	1
SNOMED CT	61928009 Platelet count (procedure)	Precoordinated Expression	2
SNOMED CT	65911000 Hepatitis B surface antibody measurement (procedure)	Precoordinated Expression	1
SNOMED CT	70901006 Creatinine measurement (procedure)	Postcoordinated Expression	1
SNOMED CT	767002 White blood cell count (procedure)	Precoordinated Expression	2
SNOMED CT	88810008 Alkaline phosphatase measurement (procedure)	Postcoordinated Expression	1
SNOMED CT	[370851004 Evaluation of diagnostic study results (procedure)] ->(363702006 Has focus (attribute))->[105377009 Ultrasonography of liver (procedure)]	Postcoordinated Expression	1
SNOMED CT	[370851004 Evaluation of diagnostic study results (procedure)] ->(363702006 Has focus (attribute))->[241549007 Computed tomography of liver (procedure)]	Postcoordinated Expression	1

System	Code	Display Text ^a	References ^b
SNOMED CT	[370851004 Evaluation of diagnostic study results (procedure)] ->(363702006 Has focus (attribute))->[241622002 Magnetic resonance imaging of liver (procedure)]	Postcoordinated Expression	1
SNOMED CT	[370851004 Evaluation of diagnostic study results (procedure)] ->(363702006 Has focus (attribute))->[441491005 Ultrasound elastography of liver (procedure)]	Postcoordinated Expression	1
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[35063004 Product containing ribavirin (medicinal product)]	Sofobuvir/Ribavirin with or without Peginterferon Alfa/Ribavirin	1
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[410841001 Ribavirin+interferon alfa-2b (product)]	Peginterferon Alfa/Ribavirin	1
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[713645002 Sofobuvir (product)]	Sofobuvir	2
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006	NS5A Protease Inhibitor	1

System	Code	Display Text ^a	References ^b
	[Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[714013001 Hepatitis C virus protein NS5A inhibitor (product)]		
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[714169007 Simeprevir + sofosbuvir (product)]	Simeprevir/Sofosbuvir	1
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[714427003 Hepatitis C virus NS3/4A protease inhibitor (product)]	NS3 Protease Inhibitor plus Peginterferon Alfa/Ribavirin	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[109841003 Liver cell carcinoma (disorder)]	Postcoordinated Expression	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[301331008 Finding of body mass index (finding)]	Postcoordinated Expression	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a Observation procedure (procedure)] -	Postcoordinated Expression	1

System	Code	Display Text ^a	References ^b
	>(363702006 Has focus (attribute))->[365865003 Finding of Hepatitis C status (finding)]		
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a Observation procedure (procedure)] - >(363702006 Has focus (attribute))->[710065009 Child-Pugh score class A (finding)]	Postcoordinated Expression	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a Observation procedure (procedure)] - >(363702006 Has focus (attribute))->[710066005 Child-Pugh score class B (finding)]	Postcoordinated Expression	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a Observation procedure (procedure)] - >(363702006 Has focus (attribute))->[710067001 Child-Pugh score class C (finding)]	Postcoordinated Expression	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a Observation procedure (procedure)] - >(363702006 Has focus (attribute))->[81308009 Disorder of brain (disorder)]	Postcoordinated Expression	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a Observation procedure (procedure)] - >(363702006 Has focus (attribute))->[302147001 Demographic history detail (observable entity)] - >(363714003 Interprets (attribute))->[103579009 Race (observable entity)]	Postcoordinated Expression	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a Observation procedure (procedure)]	Postcoordinated Expression	1

Tabular List

System	Code	Display Text ^a	References ^b
	dure (procedure)]- - >(363702006 Has focus (attribute))->[302147001 Demographic history de- tail (observable entity)]- - >(363714003 Interprets (attribute))->[364699009 Ethnic group (observable entity)]		

^aIf a code is used multiple times in the KNART, only the display text of the first instance is shown.

^bCount of the number of times the given code system and code pair is used in the KNART.

Chapter 11. Behavior Symbols

Table 11.1. Group Organizational Behavior

Sym- bol	Name	Definition
▶	Sentence Group	A group of related alternative actions is a sentence group if the item referenced by the action is the same in all the actions, and each action simply constitutes a different variation on how to specify the details for that item. For example, two actions that could be in a SentenceGroup are "aspirin, 500 mg, 2 times per day" and "aspirin, 300 mg, 3 times per day". In both cases, aspirin is the item referenced by the action, and the two actions represent two different options for how aspirin might be ordered for the patient. Note that a SentenceGroup would almost always have an associated selection behavior of "AtMostOne", unless it's a required action, in which case, it would be "ExactlyOne".
▷	Logical Group	A group with this behavior logically groups its sub-elements, and may be shown as a visual group to the end user, but it is not required to do so.
➤	Visual Group	Any group marked with this behavior should be displayed as a visual group to the end user.

Table 11.2. Group Selection Behavior

Sym- bol	Name	Definition
□	Any	Any number of the items in the group may be chosen, from zero to all.
⊙	All	All the items in the group must be selected as a single unit.
⊙	AllOrNone	All the items in the group are meant to be chosen as a single unit: either all must be selected by the end user, or none may be selected.
○	ExactlyOne	The end user must choose one and only one of the selectable items in the group. The user may not choose none of the items in the group.
⊛	AtMostOne	The end user may choose zero or at most one of the items in the group.
⊛	OneOrMore	The end user must choose a minimum of one, and as many additional as desired.

Table 11.3. Required Behavior

Sym- bol	Name	Definition
◆	Must	An action with this behavior must be included in the actions processed by the end user; the end user may not choose not to include this action.

Sym- bol	Name	Definition
◇	Could	An action with this behavior may be included in the set of actions processed by the end user.
➤	MustUnlessDocumented	An action with this behavior must be included in the set of actions processed by the end user, unless the end user provides documentation as to why the action was not included.

Table 11.4. Precheck Behavior

Sym- bol	Name	Definition
▲	Yes	An action with this behavior is one of the most frequent actions that is, or should be, included by an end user, for the particular context in which the action occurs. The system displaying the action to the end user should consider "pre-checking" such an action as a convenience for the user.
▽	No	An action with this behavior is one of the less frequent actions included by the end user, for the particular context in which the action occurs. The system displaying the actions to the end user would typically not "pre-check" such an action.

Table 11.5. Cardinality Behavior

Sym- bol	Name	Definition
◆	Single	An action with this behavior may only be completed once.
❖	Multiple	An action with this behavior may be repeated multiple times.

Table 11.6. Item Flags

Sym- bol	Name	Definition
☞	fillIn	This item, in a list entry, allows the user to enter a fill in value that is not present in the set of presented choices.

Table 11.7. Read Only Behavior

Sym- bol	Name	Definition
☆	true	For a particular action or action group, specifies whether the elements are read only.

Appendix A. References

This appendix contains the list of related resources and supporting documents used in creating this KNART.

List of References

Related Resources

[CCWP] *Gastroenterology: Hepatitis C Clinical Content White Paper*

[CSD] *Gastroenterology: Hepatitis C Documentation Template Conceptual Structure Document*

[KVRpt] *Gastroenterology: Hepatitis C Documentation Template KNART Validation Report*

Supporting Evidence

[AASLD 2017] *American Association for the Study of Liver Diseases and the Infectious Diseases Society of America. HCV Guidance: Recommendations for Testing, Managing, and Treating Hepatitis C. Updated September 2017* (link [<https://doi.org/10.1002/hep.27950>])

[Fox 2017] Fox RK. *Summary of FDA Approval for Mavyret. Published August 2017* (link [<https://www.hepatitis.va.gov/provider/hcv/mavyret-approval.asp>])

[VA 2017] *U.S. Department of Veterans Affairs. After the Initial Diagnosis of HCV: Overview of Next Steps. Published May 2017* (link [<https://www.hepatitis.va.gov/products/next-steps.asp>])

[VA 2018] *Chronic Hepatitis C Virus (HCV) Infection: Treatment Considerations [Internet].; 2017 [updated Oct 18; cited Apr 22, 2018]. Available from: <https://www.hepatitis.va.gov/provider/guidelines/hcv-treatment-considerations.asp>*. (link [<https://www.hepatitis.va.gov/provider/guidelines/hcv-treatment-considerations.asp>])

[NLM 2017a] *U.S. National Library of Medicine. HARVONI- ledipasvir and sofosbuvir tablet, film coated [Gilead Sciences, Inc]. Updated April 2017* (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=f4ec77e4-bae8-4db0-b3d5-bde09c5fa075>])

[NLM 2017b] *U.S. National Library of Medicine. MAVYRET- glecaprevir and pibrentasvir tablet, film coated [AbbVie Inc.]. Updated August 2017* (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=7bf99777-0401-9095-8645-16c6e907fcc0>])

[NLM 2016] *U.S. National Library of Medicine. REBETOL- ribavirin capsule; REBETOL- ribavirin liquid [Merck Sharp & Dohme Corp.]. Updated January 2016* (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=04d2b6f4-bd9b-4871-9527-92c81aa2d4d0>])

[NLM 2017c] *U.S. National Library of Medicine. ZEPATIER- elbasvir and grazoprevir tablet, film coated [Merck Sharp & Dohme Corp.]. Updated February 2017* (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=164dc02a-9180-426a-b8b5-04ab39d2bbd4>])

[VA 2016a] *VA Pharmacy Benefits Management Services, Medical Advisory Panel, VISN Pharmacist Executives and Office of Public Health. Elbasvir/Grazoprevir (Zepatier™) Criteria for Use. Published February 2016* (link [<https://www.pbm.va.gov/apps/VANationalFormulary/>])

[VA 2016b] *VA Pharmacy Benefits Management Services, Medical Advisory Panel, VISN Pharmacist Executives and Office of Public Health. Ledipasvir/Sofosbuvir (Harvoni®) and Sofosbuvir/Velpatasvir (Epclusa®) Criteria for Use. Published September 2016* (link [<https://www.pbm.va.gov/apps/VANationalFormulary/>])