

Gastroenterology: Hepatitis C Documentation Template

Documentation Template: Conceptual Structure

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

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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)

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Preface

Table 1. Revision History

Date	Life Cycle Event
June 14, 2018	Published
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. FirbroscanInterpretation

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:

response: Code (Multiple)

response EnumerationConstraint (List)

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.

#	<p># prompt: Ascites due to liver failure</p> <p>response: Boolean (Single)</p>
#	<p># prompt: Cirrhosis</p> <p>response: Boolean (Single)</p> <p>responseBinding: Property ("Cirrhosis")</p>
#	<p>Condition:elm:Property</p>
	<p># prompt: Child Turcotte Pugh Class for this patient</p> <p>response: EntityName (Single)</p> <p>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>
#	<p># prompt: Encephalopathy</p> <p>itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[81308009 Disorder of brain (disorder)]</p> <p>response: Boolean (Single)</p> <p>initalValue: Encephalopathy</p>
#	<p># prompt: Hepatocellular Carcinoma</p> <p>itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[109841003 Liver cell carcinoma (disorder)]</p> <p>response: Boolean (Single)</p> <p>initalValue: HepatocellularCarcinoma</p>
#	<p># prompt: Liver Transplant</p> <p>itemCode: 18027006 Transplantation of liver (procedure) </p>

Liver Complications or
Extrahepatic Manifestations.

#	response: Boolean (Single)
	responseBinding: Property ("LiverTransplant")
#	Condition: elm:Property
	# prompt: Date
#	response: Timestamp (Single)
	initalValue: LiverTransplantDate
#	# prompt: Hepatitis C Infection status of the allograft
	response: String (Single)
#	initalValue: HepatitisCInfectionStatusOfTheAllograft
	# prompt: Other Liver Complications or Extrahepatic Manifestations
#	response: Boolean (Single)
	Condition: elm:Property
#	# prompt: Details
	response: String (Single)

Chapter 8. Prior Lab Results

#	Condition: elm:Not (elm:Exists(CompleteBloodCountInLast12Months))
	# 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")
	# Condition: elm:Property
	# actionSentence[type=elm:Instance, classType=anf:ClinicalStatement] statementType: Precoordinated Expression 385644000 Requested (qualifier value) topic: Precoordinated Expression 26604007 Complete blood count (procedure)
#	Condition: elm:Exists (CompleteBloodCountInLast12Months)
	# prompt: Complete Blood Count response: Boolean (Single) # prompt: Date response: Timestamp (Single) initialValue: elm:Property CompleteBloodCountInLast12Months # prompt: White Blood Cell Count (K/microliter) itemCode: 767002 White blood cell count (procedure) response: Real (Single) initialValue: WhiteBloodCountInLast12Month # prompt: Mean Cell Volume (femtoliters) response: Real (Single) initialValue: MeanCellVolumeInLast12Month # prompt: Hemoglobin (g/dL) itemCode: 441689006 Measurement of total hemoglobin concentration (procedure) response: Real (Single) initialValue: HemoglobinInLast12Month # prompt: Platelet Count (K/microliter) itemCode: 61928009 Platelet count (procedure) response: Real (Single) initialValue: PlateletCountInLast12Month
	# Hepatic Function Panel prompt: itemCode: 26958001 Hepatic function panel (procedure) response: Boolean (Single)

#	
	<p># prompt: Date</p> <p>response: Timestamp (Single)</p> <p># prompt: Albumin (d/dL)</p> <p>itemCode: 26758005 Albumin measurement (procedure) </p> <p>response: Real (Single)</p> <p># prompt: Total Bilirubin (mg/dL)</p> <p>itemCode: 359986008 Bilirubin, total measurement (procedure) </p> <p>response: Real (Single)</p> <p># prompt: Alanine Aminotransferase (U/L)</p> <p>itemCode: 34608000 Alanine aminotransferase measurement (procedure) </p> <p>response: Real (Single)</p> <p># prompt: Aspartate Aminotransferase (U/L)</p> <p>itemCode: 45896001 Aspartate aminotransferase measurement (procedure) </p> <p>response: Real (Single)</p> <p># prompt: Alkaline Phosphatase (U/L)</p> <p>itemCode: 88810008 Alkaline phosphatase measurement (procedure) </p> <p>response: Real (Single)</p>
	# International Normalized Ratio
	prompt:
	itemCode: 440685005 Calculation of international normalized ratio (procedure)
	response: Boolean (Single)
#	
	<p># prompt: Date</p> <p>response: Timestamp (Single)</p> <p># prompt: Results</p> <p>response: Real (Single)</p>
	# Estimated Glomerular Filtration Rate
	prompt:
	itemCode: 395680003 Estimated creatine clearance (procedure)
	response: Boolean (Single)
#	
	<p># prompt: Date</p> <p>response: Timestamp (Single)</p> <p># prompt: Results (mL/min per 1.73 m^2)</p> <p>response: Real (Single)</p>
	# Creatinine
	prompt:
	itemCode: 70901006 Creatinine measurement (procedure)
	response: Boolean (Single)
#	

	<p># prompt: Date</p> <p>response: Timestamp (Single)</p> <p># prompt: Results (mg/dL)</p> <p>response: Real (Single)</p>
# HCV Viral Load [Quantitative HCV Ribonucleic Acid (RNA)]	
prompt:	
itemCode: 395197008 Hepatitis C viral load (procedure)	
response: Boolean (Single)	
#	
	<p># prompt: Date</p> <p>response: Timestamp (Single)</p> <p># prompt: Results (IU/L)</p> <p>response: Real (Single)</p>
# HCV Genotype	
prompt:	
itemCode: 397662006 Hepatitis C virus genotype determination (procedure)	
response: Boolean (Single)	
#	
	<p># prompt: Date</p> <p>response: Timestamp (Single)</p> <p># prompt: Results</p> <p>response: SimpleCode (Single)</p>
# HIV Test	
prompt:	
itemCode: 165813002 Human immunodeficiency virus test (procedure)	
response: Boolean (Single)	
#	
	<p># prompt: Date</p> <p>response: Timestamp (Single)</p> <p># prompt: Results</p> <p>response: Boolean (Single)</p>
# Hepatitis B Screen	
prompt:	
itemCode: 314099008 Hepatitis B screening test (procedure)	
response: Boolean (Single)	
#	
	<p># prompt: Date</p> <p>response: Timestamp (Single)</p> <p># prompt: HBsAg</p> <p>itemCode: 47758006 Hepatitis B surface antigen measurement (procedure) </p>

response: Boolean (Single)
prompt: Anti-HBs
itemCode: 65911000 Hepatitis B surface antibody measurement (procedure)
response: Boolean (Single)
prompt: Anti-HBc
itemCode: 59582004 Hepatitis B core antibody measurement (procedure)
response: Boolean (Single)

Chapter 9. Imaging Results

prompt: Liver Ultrasound Interpretation

response: String (Single)

initalValue: LiveUltrasoundInterpretation

prompt: Liver Computed Tomography (CT) Interpretation

response: String (Single)

initalValue: LiverCTInterpretation

prompt: Liver Magnetic Resonance Imaging (MRI) Interpretation

response: String (Single)

initalValue: LiverMRIInterpretation

prompt: Fibroscan Interpretation

response: String (Single)

initalValue: 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 creatine 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 alpha-2b (product)]	Peginterferon Alfa/Ribavirin	1
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[713645002 Sofosbuvir (product)]	Sofobuvir	2

System	Code	Display Text ^a	References ^b
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[714013001 Hepatitis C virus protein NS5A inhibitor (product)]	NS5A Protease Inhibitor	1
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	[a997cc03-3e99-40eb-833a-0354c7750d3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[109841003 Liver cell carcinoma (disorder)]	Basal cell carcinoma Expression	2
SNOMED CT	[a997cc03-3e99-40eb-833a-0354c7750d3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[301331008 Finding of body mass index (finding)]	Basal cell carcinoma Expression	2
SNOMED CT	[a997cc03-3e99-40eb-833a-0354c7750d3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[301331008 Finding of body mass index (finding)]	Basal cell carcinoma Expression	1

^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

Symbol	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

Symbol	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

Symbol	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.
◇	Could	An action with this behavior may be included in the set of actions processed by the end user.

Symbol	Name	Definition
➤	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

Symbol	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

Symbol	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

Symbol	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

Symbol	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-bde09c5fa075j>])

[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=7bf99777-0401-9095-8645-16c6e907fcc0j>])

[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-4871-9527-92c81aa2d4d0j>])

[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-b8b5-04ab39d2bbd4j>])

[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/>])