

# **Gastroenterology: Hepatitis C - Elbasvir/Grazoprevir Order Set**

## **Order Set: Conceptual Structure**

**Contract: VA118-16-D-1008, Task Order (TO): VA-118-16-F-1008-0007, CLIN0004AF**

**Department of Veterans Affairs (VA)**



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

**Publication date 06/14/2018**

**Version: 1.0**

---

# Gastroenterology: Hepatitis C - Elbasvir/Grazoprevir Order Set: Order Set: Conceptual Structure

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

Publication date 06/14/2018

Copyright © 2018 B3 Group, Inc.

Copyright © 2018 Cognitive Medical Systems, Inc.

## B3 Group, Inc.

### NOTICE OF GOVERNMENT COPYRIGHT LICENSE AND UNLIMITED RIGHTS LICENSE

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License.

You may obtain a copy of the License at <http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

Portions of this content are derivative works from content produced by Cognitive Medical Systems, Inc. licensed under the Apache License, Version 2.0.

Additional portions of this content are derivative works from content contributed by Motive Medical Intelligence Inc., under Creative Commons Attribution-ShareAlike 4.0.

Contributions from 2013-2018 were performed either by US Government employees, or under US Veterans Health Administration contracts.

US Veterans Health Administration contributions by government employees are work of the U.S. Government and are not subject to copyright protection in the United States. Portions contributed by government employees are USGovWork (17USC §105). Not subject to copyright.

See: <https://www.usa.gov/government-works>

Contribution by contractors to the US Veterans Health Administration during this period are contractually contributed under the Apache License, Version 2.0 and US Government sponsorship is acknowledged under Contract VA118-16-D-1008, Task Order VA11817F10080007.

## Cognitive Medical Systems, Inc.

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License.

You may obtain a copy of the License at <http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

This and related content produced by Cognitive Medical Systems, Inc. licensed under the Apache License, Version 2.0 is available at: <https://bitbucket.org/cogmedsys/hl7-kas-examples>

Additional portions of this content are derivative works from content contributed by Motive Medical Intelligence Inc., under Creative Commons Attribution-ShareAlike 4.0. <https://bitbucket.org/cogmedsys/kas-source-material>

Contributions from 2013-2018 were performed either by US Government employees, or under US Veterans Health Administration contracts.

US Veterans Health Administration contributions by government employees are work of the U.S. Government and are not subject to copyright protection in the United States. Portions contributed by government employees are USGovWork (17USC §105). Not subject to copyright. See: <https://www.usa.gov/government-works>

Contribution by contractors to the US Veterans Health Administration during this period are contractually contributed under the Apache License, Version 2.0 and US Government sponsorship is acknowledged under Contract VA118-16-D-1008-0007.

---

---

# Table of Contents

Preface .....	v
Artifact Applicability .....	vi
Models .....	vii
1. External Data Definitions .....	1
Definitions .....	1
Triggers .....	2
2. Expression Definitions .....	3
3. Medications .....	4
4. Laboratory Tests .....	21
5. Patient and Caregiver Education .....	25
6. Tabular List .....	26
7. Behavior Symbols .....	29
A. References .....	31

---

## List of Tables

1. Revision History .....	v
2. Clinical White Paper Contributors .....	v
3. Artifact Identifier .....	v
4. Applicability Foci, Description and Codes .....	vi
5. Model References .....	vii
1.1. HCV genotype 1 time .....	1
1.2. Hepatitis B surface antigen (HBsAg) 1 time .....	1
1.3. Hepatitis B core antibody (HBcAb) 1 time .....	1
1.4. Hepatitis B surface antibody (HBsAb) 1 time .....	1
1.5. Hepatitis A antibody (HAVAb) 1 time .....	1
1.6. HCV viral load (quantitative HCV RNA) 1 time .....	2
1.7. HIV test 1 time .....	2
1.8. Resistance-associated substitutions 1 time .....	2
1.9. Qualitative human chorionic gonadotropin 1 time .....	2
6.1. Terminology Versions .....	26
6.2. Terminology References .....	26
7.1. Group Organizational Behavior .....	29
7.2. Group Selection Behavior .....	29
7.3. Required Behavior .....	29
7.4. Precheck Behavior .....	30
7.5. Cardinality Behavior .....	30
7.6. Item Flags .....	30
7.7. Read Only Behavior .....	30

---

# Preface

**Table 1. Revision History**

Date	Life Cycle Event
June 14, 2018	Published
May 3, 2018	Published
May 3, 2018	Reviewed
August 29, 2017	Pre-published
August 10, 2017	Created

**Table 2. Clinical White Paper Contributors**

Name	Role	Affiliation
David Kaplan, MD	Author	Staff Physician Gastroenterology Philadelphia, PA
Timothy Morgan, MD	Author	Long Beach VAMC Physician Long Beach, CA
James Wilson, MD	Author	Puget Sound Healthcare System Administrative Specialist Seattle, WA
Jason Dominitz, MD	Author	Puget Sound Healthcare System National Director of Gastroenterology Seattle, WA
Byron Cryer, MD	Author	North Texas VHCS Physician Dallas, TX
Ashley Faulx, MD	Author	Louis Stokes Cleveland DVA Medical Center Med-GI Fellow Cleveland, OH
Lyn Sue Kahng, MD	Author	Jesse Brown VAMC Section Chief, GI Chicago, IL
Heiko Pohl, MD	Author	Physician White River Junction VAMC White River Junction, VT
Aasma Shaukat, MD	Author	Minneapolis VAMC Minneapolis, MN
Walter Smalley, MD	Author	Tennessee Valley HCS Nashville, TN
Pamela (Pam) Belperio	Author	PharmD/Clinical Pharmacist Population Health Services Los Angeles, CA
Lisa Backus	Author	Deputy Chief Consultant Population Health Services Palo Alto, CA

**Table 3. Artifact Identifier**

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	3b1639d1-b90b-523d-83b9-cdc4f9dc90bb	B28

---

# Artifact Applicability

**Table 4. Applicability Foci, Description and Codes**

Focus	Description	Code System	Code	Value Set	Value Set Version
TargetUser	Primary Care physicians	SNOMED CT	453231000124104  Primary care provider (occupation)	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 with chronic Hepatitis C infection	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. HCV genotype 1 time**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [397662006  Hepatitis C virus genotype determination (procedure)]
dateRange[elm:Interval] low: elm:Add( elm:Today() elm:Quantity(-5 year))
high: elm:Today()

**Table 1.2. Hepatitis B surface antigen (HBsAg) 1 time**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [47758006  Hepatitis B surface antigen measurement (procedure)]
dateRange[elm:Interval] low: elm:Add( elm:Today() elm:Quantity(-10 year))
high: elm:Today()

**Table 1.3. Hepatitis B core antibody (HBcAb) 1 time**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [59582004  Hepatitis B core antibody measurement (procedure)]
dateRange[elm:Interval] low: elm:Add( elm:Today() elm:Quantity(-10 year))
high: elm:Today()

**Table 1.4. Hepatitis B surface antibody (HBsAb) 1 time**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [65911000  Hepatitis B surface antibody measurement (procedure)]
dateRange[elm:Interval] low: elm:Add( elm:Today() elm:Quantity(-10 year))
high: elm:Today()

**Table 1.5. Hepatitis A antibody (HAVAb) 1 time**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [697001  Hepatitis A virus antibody measurement (procedure)]



dateRange[elm:Interval] low: elm:Add( elm:Today() elm:Quantity(-10 year)) high: elm:Today()
--

**Table 1.6. HCV viral load (quantitative HCV RNA) 1 time**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [395197008  Hepatitis C viral load (procedure)] dateRange[elm:Interval] low: elm:Add( elm:Today() elm:Quantity(-6 month)) high: elm:Today()
--

**Table 1.7. HIV test 1 time**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [359796005  Measurement of both Human immunodeficiency virus 1 antibody and Human immunodeficiency virus 2 antibody (procedure)] dateRange[elm:Interval] low: elm:Add( elm:Today() elm:Quantity(-5 year)) high: elm:Today()
---

**Table 1.8. Resistance-associated substitutions 1 time**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [8671fdfe-53a5-4cae-91a3-61fd23f5bbd4  Analysis of resistance- associated substitutions in Hepatitis C virus genes (procedure)] dateRange[elm:Interval] low: elm:Add( elm:Today() elm:Quantity(-5 year)) high: elm:Today()
--

**Table 1.9. Qualitative human chorionic gonadotropin 1 time**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [386558001  Chorionic gonadotropin, beta-subunit measurement (procedure)] dateRange[elm:Interval] low: elm:Add( elm:Today() elm:Quantity(-2 week)) high: elm:Today()
--

## Triggers

No trigger definitions are present.

---

# Chapter 2. Expression Definitions

No expression definitions are present.

---

## Chapter 3. Medications

Elbasvir/grazoprevir is contraindicated in patients with decompensated cirrhosis. Elbasvir/grazoprevir should not be used in combination with 1) strong CYP3A inducers; or 2) OATP1B1/3 inhibitors; or 3) efavirenz. Providers should check <http://www.hep-druginteractions.org>, <https://www.hepatitis.va.gov/provider/guidelines/hcv-treatment-considerations.asp>, and/or a pharmacist for additional drug interactions or contraindications before starting elbasvir/grazoprevir.

HEP drug interactions link [<http://www.hep-druginteractions.org>]

([Morgan 2017]) Chronic hepatitis C virus (HCV) infection: Treatment considerations link [<https://www.hepatitis.va.gov/provider/guidelines/hcv-treatment-considerations.asp>]

Qualifications for the following treatment include: Genotype 1a, Treatment-Naïve or Treatment-Experienced (PEG/RBV), No NS5A Polymorphisms at Position 28, 30, 31, or 93, without Cirrhosis or with Compensated Cirrhosis (CTP A).

# Elbasvir/grazoprevir (50 mg/100 mg) 1 tablet oral, daily, 28 tablets 2 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration  
(procedure)] ->(260686004 |Method (attribute))->[129445006  
|Administration - action (qualifier value)] ->(363701004 |  
Direct substance (attribute))->[Rx;1734636 elbasvir 50 MG /  
grazoprevir 100 MG Oral Tablet] ->(410675002 |Route of  
administration (attribute))->[260548002 |Oral (qualifier value)]

unstructured[0]: 28 tablets 2 refills

requestedResult.lowerBound: 1

requestedResult.upperBound: 1

requestedResult.includeLowerBound: true

requestedResult.includeUpperBound: true

requestedResult.measureSemantic: Precoordinated Expression  
421026006 |Conventional release oral tablet (dose form)|

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

repetition[0].periodDuration.lowerBound: 1

repetition[0].periodDuration.upperBound: 84

repetition[0].periodDuration.includeLowerBound: true

repetition[0].periodDuration.includeUpperBound: true

repetition[0].periodDuration.resolution: 1

repetition[0].periodDuration.measureSemantic: Precoordinated  
Expression 258703001 |day (qualifier value)|

repetition[0].eventFrequency.lowerBound: 1

repetition[0].eventFrequency.upperBound: 1

repetition[0].eventFrequency.includeLowerBound: true

repetition[0].eventFrequency.includeUpperBound: true

	<p>repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258703001  day (qualifier value) </p> <p>Qualifications for the following treatment include: Genotype 1a, Treatment-Naïve, with NS5A Polymorphisms at Position 28, 30, 31, or 93, without Cirrhosis or with Compensated Cirrhosis (CTP A).</p>
	<p># Elbasvir/grazoprevir (50 mg/100 mg) 1 tablet oral, daily, 28 tablets 3 refills (routine)</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000   Requested (qualifier value) </p> <p>topic: Postcoordinated Expression [416118004  Administration (procedure)] -&gt;(260686004  Method (attribute))-&gt;[129445006  Administration - action (qualifier value)] -&gt;(363701004  Direct substance (attribute))-&gt;[Rx;1734636 elbasvir 50 MG / grazoprevir 100 MG Oral Tablet] -&gt;(410675002  Route of administration (attribute))-&gt;[260548002  Oral (qualifier value)]</p> <p>unstructured[0]: 28 tablets 3 refills</p> <p>requestedResult.lowerBound: 1</p> <p>requestedResult.upperBound: 1</p> <p>requestedResult.includeLowerBound: true</p> <p>requestedResult.includeUpperBound: true</p> <p>requestedResult.measureSemantic: Precoordinated Expression 421026006  Conventional release oral tablet (dose form) </p> <p>priority: Precoordinated Expression 50811001  Routine (qualifier value) </p> <p>repetition[0].periodDuration.lowerBound: 1</p> <p>repetition[0].periodDuration.upperBound: 112</p> <p>repetition[0].periodDuration.includeLowerBound: true</p> <p>repetition[0].periodDuration.includeUpperBound: true</p> <p>repetition[0].periodDuration.resolution: 1</p> <p>repetition[0].periodDuration.measureSemantic: Precoordinated Expression 258703001  day (qualifier value) </p> <p>repetition[0].eventFrequency.lowerBound: 1</p> <p>repetition[0].eventFrequency.upperBound: 1</p> <p>repetition[0].eventFrequency.includeLowerBound: true</p> <p>repetition[0].eventFrequency.includeUpperBound: true</p> <p>repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258703001  day (qualifier value) </p>
	<p># Ribavirin 200 mg capsule oral, take 2 capsules every morning and 3 capsules every evening; take with food 140 capsules 2 refills (routine)</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000   Requested (qualifier value) </p> <p>topic: Postcoordinated Expression [416118004  Administration (procedure)] -&gt;(260686004  Method (attribute))-&gt;[129445006  </p>

Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral Capsule] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]

unstructured[0]: 3 capsules every evening; take with food 140 capsules 2 refills

statementAssociation[0].statementId: 8063df5e-58d2-439f-8434-dc5a5b82b7f4

statementAssociation[1].statementId: 196fc302-c2b4-4802-96ba-49651d474337

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

repetition[0].periodDuration.lowerBound: 1

repetition[0].periodDuration.upperBound: 84

repetition[0].periodDuration.includeLowerBound: true

repetition[0].periodDuration.includeUpperBound: true

repetition[0].periodDuration.resolution: 1

repetition[0].periodDuration.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|

# Ribavirin 200 mg capsule oral, take 3 capsules every morning and 3 capsules every evening; take with food 168 capsules 2 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral Capsule] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]

unstructured[0]: take 3 capsules every morning and 3 capsules every evening; take with food; 140 capsules 2 refills

requestedResult.lowerBound: 3

requestedResult.upperBound: 3

requestedResult.includeLowerBound: true

requestedResult.includeUpperBound: true

requestedResult.measureSemantic: Precoordinated Expression 421026006 |Conventional release oral tablet (dose form)|

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

repetition[0].periodDuration.lowerBound: 1

repetition[0].periodDuration.upperBound: 112

repetition[0].periodDuration.includeLowerBound: true

repetition[0].periodDuration.includeUpperBound: true

repetition[0].periodDuration.resolution: 1

repetition[0].periodDuration.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|  
 repetition[0].eventFrequency.lowerBound: 1  
 repetition[0].eventFrequency.upperBound: 1  
 repetition[0].eventFrequency.includeLowerBound: true  
 repetition[0].eventFrequency.includeUpperBound: true  
 repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 3157002 |Evening (qualifier value)|

Qualifications for the following treatment include: Genotype 1a, Treatment-Experienced (First Generation Protease Inhibitor Plus PEG/RBV), No NS5A Polymorphisms at Position 28, 30, 31, or 93, without Cirrhosis or with Compensated Cirrhosis (CTP A).

# Elbasvir/grazoprevir (50 mg/100 mg) 1 tablet oral, daily, 28 tablets 2 refills (routine)daily  
 actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|  
 topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;1734636 elbasvir 50 MG / grazoprevir 100 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]  
 unstructured[0]: 28 tablets 2 refills  
 requestedResult.lowerBound: 1  
 requestedResult.upperBound: 1  
 requestedResult.includeLowerBound: true  
 requestedResult.includeUpperBound: true  
 requestedResult.measureSemantic: Precoordinated Expression 421026006 |Conventional release oral tablet (dose form)|  
 priority: Precoordinated Expression 50811001 |Routine (qualifier value)|  
 repetition[0].periodDuration.lowerBound: 1  
 repetition[0].periodDuration.upperBound: 84  
 repetition[0].periodDuration.includeLowerBound: true  
 repetition[0].periodDuration.includeUpperBound: true  
 repetition[0].periodDuration.resolution: 1  
 repetition[0].periodDuration.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|  
 repetition[0].eventFrequency.lowerBound: 1  
 repetition[0].eventFrequency.upperBound: 1  
 repetition[0].eventFrequency.includeLowerBound: true  
 repetition[0].eventFrequency.includeUpperBound: true  
 repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|

# Ribavirin 200 mg capsule oral, take 2 capsules every morning and 3 capsules every evening;  
take with food 140 capsules 2 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration  
(procedure)] ->(260686004 |Method (attribute))->[129445006 |  
Administration - action (qualifier value)] ->(363701004 |Direct  
substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral  
Capsule] ->(410675002 |Route of administration (attribute))-  
>[260548002 |Oral (qualifier value)]

unstructured[0]: take 3 capsules every morning and 3 capsules  
every evening; take with food; 140 capsules 2 refills

statementAssociation[0].statementId:  
8063df5e-58d2-439f-8434-dc5a5b82b7f4

statementAssociation[1].statementId: 196fc302-  
c2b4-4802-96ba-49651d474337

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

repetition[0].periodDuration.lowerBound: 1

repetition[0].periodDuration.upperBound: 84

repetition[0].periodDuration.includeLowerBound: true

repetition[0].periodDuration.includeUpperBound: true

repetition[0].periodDuration.resolution: 1

repetition[0].periodDuration.measureSemantic: Precoordinated  
Expression 258703001 |day (qualifier value)|

# Ribavirin 200 mg capsule oral, take 3 capsules every morning and 3 capsules every evening;  
take with food 168 capsules 2 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration  
(procedure)] ->(260686004 |Method (attribute))->[129445006 |  
Administration - action (qualifier value)] ->(363701004 |Direct  
substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral  
Capsule] ->(410675002 |Route of administration (attribute))-  
>[260548002 |Oral (qualifier value)]

requestedResult.lowerBound: 3

requestedResult.upperBound: 3

requestedResult.includeLowerBound: true

requestedResult.includeUpperBound: true

requestedResult.measureSemantic: Precoordinated Expression  
421026006 |Conventional release oral tablet (dose form)|

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

```

repetition[0].periodDuration.lowerBound: 1
repetition[0].periodDuration.upperBound: 84
repetition[0].periodDuration.includeLowerBound: true
repetition[0].periodDuration.includeUpperBound: true
repetition[0].periodDuration.resolution: 1
repetition[0].periodDuration.measureSemantic: Precoordinated
Expression 258703001 |day (qualifier value)|
repetition[0].eventFrequency[0].lowerBound: 1
repetition[0].eventFrequency[0].upperBound: 1
repetition[0].eventFrequency[0].includeLowerBound: true
repetition[0].eventFrequency[0].includeUpperBound: true
repetition[0].eventFrequency[0].measureSemantic:
Precoordinated Expression 73775008 |Morning (qualifier
value)|
repetition[0].eventFrequency[1].lowerBound: 1
repetition[0].eventFrequency[1].upperBound: 1
repetition[0].eventFrequency[1].includeLowerBound: true
repetition[0].eventFrequency[1].includeUpperBound: true
repetition[0].eventFrequency[1].measureSemantic:
Precoordinated Expression 3157002 |Evening (qualifier value)|

```

Qualifications for the following treatment include: Genotype 1a, Treatment-Experienced (PEG/RBV or First Generation Protease Inhibitor Plus PEG/RBV), with NS5A Polymorphisms at Position 28, 30, 31, or 93, without Cirrhosis or with Compensated Cirrhosis (CTP A).

# Elbasvir/grazoprevir (50 mg/100 mg) 1 tablet oral, daily, 28 tablets 3 refills (routine) daily  
 actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

```

statementType: Precoordinated Expression 385644000 |
Requested (qualifier value)|
topic: Postcoordinated Expression [416118004 |Administration
(procedure)] ->(260686004 |Method (attribute))->[129445006 |
Administration - action (qualifier value)] ->(363701004 |Direct
substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral
Capsule] ->(410675002 |Route of administration (attribute))-
>[260548002 |Oral (qualifier value)]
unstructured[0]: 28 tablets 3 refills
requestedResult.lowerBound: 1
requestedResult.upperBound: 1
requestedResult.includeLowerBound: true
requestedResult.includeUpperBound: true
requestedResult.measureSemantic: Precoordinated Expression
421026006 |Conventional release oral tablet (dose form)|
priority: Precoordinated Expression 50811001 |Routine
(qualifier value)|
repetition[0].periodDuration.lowerBound: 1

```



```

repetition[0].periodDuration.upperBound: 112
repetition[0].periodDuration.includeLowerBound: true
repetition[0].periodDuration.includeUpperBound: true
repetition[0].periodDuration.resolution: 1
repetition[0].periodDuration.measureSemantic: Precoordinated
Expression 258703001 |day (qualifier value)|
repetition[0].eventFrequency.lowerBound: 1
repetition[0].eventFrequency.upperBound: 1
repetition[0].eventFrequency.includeLowerBound: true
repetition[0].eventFrequency.includeUpperBound: true
repetition[0].eventFrequency.measureSemantic:
Precoordinated Expression 258703001 |day (qualifier value)|
# Ribavirin 200 mg capsule oral, take 2 capsules every morning and 3 capsules every evening;
take with food 140 capsules 2 refills (routine)
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
    statementType: Precoordinated Expression 385644000 |
    Requested (qualifier value)|
    topic: Postcoordinated Expression [416118004 |Administration
    (procedure)] ->(260686004 |Method (attribute))->[129445006 |
    Administration - action (qualifier value)] ->(363701004 |Direct
    substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral
    Capsule] ->(410675002 |Route of administration (attribute))-
    >[260548002 |Oral (qualifier value)]
    unstructured[0]: take 3 capsules every morning and 3 capsules
    every evening; take with food; 140 capsules 2 refills
    requestedResult.lowerBound: 1
    requestedResult.upperBound: 1
    requestedResult.includeLowerBound: true
    requestedResult.includeUpperBound: true
    requestedResult.measureSemantic: Precoordinated Expression
    420692007 |Conventional release oral capsule (dose form)|
    priority: Precoordinated Expression 50811001 |Routine
    (qualifier value)|
    repetition[0].periodDuration.lowerBound: 1
    repetition[0].periodDuration.upperBound: 84
    repetition[0].periodDuration.includeLowerBound: true
    repetition[0].periodDuration.includeUpperBound: true
    repetition[0].periodDuration.resolution: 1
    repetition[0].periodDuration.measureSemantic: Precoordinated
    Expression 258703001 |day (qualifier value)|
# Ribavirin 200 mg capsule oral, take 3 capsules every morning and 3 capsules every evening;
take with food 168 capsules 2 refills (routine)
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

```

statementType: Precoordinated Expression 385644000 | Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral Capsule] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]

unstructured[0]: take 3 capsules every morning and 3 capsules every evening; take with food; 168 capsules 2 refills

requestedResult.lowerBound: 3

requestedResult.upperBound: 3

requestedResult.includeLowerBound: true

requestedResult.includeUpperBound: true

requestedResult.measureSemantic: Precoordinated Expression 420692007 |Conventional release oral capsule (dose form)|

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

repetition[0].periodDuration.lowerBound: 1

repetition[0].periodDuration.upperBound: 84

repetition[0].periodDuration.includeLowerBound: true

repetition[0].periodDuration.includeUpperBound: true

repetition[0].periodDuration.resolution: 1

repetition[0].periodDuration.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|

repetition[0].eventFrequency.lowerBound: 1

repetition[0].eventFrequency.upperBound: 1

repetition[0].eventFrequency.includeLowerBound: true

repetition[0].eventFrequency.includeUpperBound: true

repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|

Qualifications for the following treatment include: Genotype 1b, Treatment-Naïve or Treatment-Experienced (PEG/RBV), without Cirrhosis or with Compensated Cirrhosis (CTP A).

# Elbasvir/grazoprevir (50 mg/100 mg) 1 tablet oral, daily, 28 tablets 2 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 | Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;1734636 elbasvir 50 MG / grazoprevir 100 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]

unstructured[0]: 28 tablets 2 refills

requestedResult.lowerBound: 1  
 requestedResult.upperBound: 1  
 requestedResult.includeLowerBound: true  
 requestedResult.includeUpperBound: true  
 requestedResult.measureSemantic: Precoordinated Expression 420692007 |Conventional release oral capsule (dose form)|  
 priority: Precoordinated Expression 50811001 |Routine (qualifier value)|  
 repetition[0].periodDuration.lowerBound: 1  
 repetition[0].periodDuration.upperBound: 84  
 repetition[0].periodDuration.includeLowerBound: true  
 repetition[0].periodDuration.includeUpperBound: true  
 repetition[0].periodDuration.resolution: 1  
 repetition[0].periodDuration.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|  
 repetition[0].eventFrequency.lowerBound: 1  
 repetition[0].eventFrequency.upperBound: 1  
 repetition[0].eventFrequency.includeLowerBound: true  
 repetition[0].eventFrequency.includeUpperBound: true  
 repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|

Qualifications for the following treatment include: Genotype 1b, Treatment-Experienced (First Generation Protease Inhibitor Plus PEG/RBV), without Cirrhosis or with Compensated Cirrhosis (CTP A).

# Elbasvir/grazoprevir (50 mg/100 mg) 1 tablet oral, daily, 28 tablets 2 refills (routine)daily

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 | Requested (qualifier value)|  
 topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;1734636 elbasvir 50 MG / grazoprevir 100 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]  
 unstructured[0]: 28 tablets 2 refills  
 requestedResult.lowerBound: 1  
 requestedResult.upperBound: 1  
 requestedResult.includeLowerBound: true  
 requestedResult.includeUpperBound: true  
 priority: Precoordinated Expression 49499008 |Stat (qualifier value)|  
 repetition[0].periodDuration.lowerBound: 1  
 repetition[0].periodDuration.upperBound: 84

```

repetition[0].periodDuration.includeLowerBound: true
repetition[0].periodDuration.includeUpperBound: true
repetition[0].periodDuration.resolution: 1
repetition[0].periodDuration.measureSemantic: Precoordinated
Expression 258703001 |day (qualifier value)|
repetition[0].eventFrequency.lowerBound: 1
repetition[0].eventFrequency.upperBound: 1
repetition[0].eventFrequency.includeLowerBound: true
repetition[0].eventFrequency.includeUpperBound: true
repetition[0].eventFrequency.measureSemantic:
Precoordinated Expression 258703001 |day (qualifier value)|
# Ribavirin 200 mg capsule oral, take 2 capsules every morning and 3 capsules every evening;
take with food 140 capsules 2 refills (routine)
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
    statementType: Precoordinated Expression 385644000 |
    Requested (qualifier value)|
    topic: Postcoordinated Expression [416118004 |Administration
    (procedure)] ->(260686004 |Method (attribute))->[129445006 |
    Administration - action (qualifier value)] ->(363701004 |Direct
    substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral
    Capsule] ->(410675002 |Route of administration (attribute))-
    >[260548002 |Oral (qualifier value)]
    unstructured[0]: take 3 capsules every morning and 3 capsules
    every evening; take with food; 140 capsules 2 refills
    repetition[0].periodDuration.lowerBound: 1
    repetition[0].periodDuration.upperBound: 84
    repetition[0].periodDuration.includeLowerBound: true
    repetition[0].periodDuration.includeUpperBound: true
    repetition[0].periodDuration.resolution: 1
    repetition[0].periodDuration.measureSemantic: Precoordinated
    Expression 258703001 |day (qualifier value)|
# Ribavirin 200 mg capsule oral, take 3 capsules every morning and 3 capsules every evening;
take with food 168 capsules 2 refills (routine)
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
    topic: Postcoordinated Expression [416118004 |Administration
    (procedure)] ->(260686004 |Method (attribute))->[129445006 |
    Administration - action (qualifier value)] ->(363701004 |Direct
    substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral
    Capsule] ->(410675002 |Route of administration (attribute))-
    >[260548002 |Oral (qualifier value)]
    unstructured[0]: take 3 capsules every morning and 3 capsules
    every evening; take with food; 168 capsules 2 refills
    requestedResult.lowerBound: 3
    requestedResult.upperBound: 3
    requestedResult.includeLowerBound: true

```

requestedResult.includeUpperBound: true  
 requestedResult.measureSemantic: Precoordinated Expression  
 421026006 |Conventional release oral tablet (dose form)|  
 priority: Precoordinated Expression 50811001 |Routine  
 (qualifier value)|  
 repetition[0].periodDuration.lowerBound: 1  
 repetition[0].periodDuration.upperBound: 84  
 repetition[0].periodDuration.includeLowerBound: true  
 repetition[0].periodDuration.includeUpperBound: true  
 repetition[0].periodDuration.resolution: 1  
 repetition[0].periodDuration.measureSemantic: Precoordinated  
 Expression 258703001 |day (qualifier value)|  
 repetition[0].eventFrequency.lowerBound: 1  
 repetition[0].eventFrequency.upperBound: 1  
 repetition[0].eventFrequency.includeLowerBound: true  
 repetition[0].eventFrequency.includeUpperBound: true  
 repetition[0].eventFrequency.measureSemantic:  
 Precoordinated Expression 258703001 |day (qualifier value)|

Qualifications for the following treatment include: Genotype 4, Treatment-Naïve, without Cirrhosis or with Compensated Cirrhosis (CTP A).

# Elbasvir/grazoprevir (50 mg/100 mg) 1 tablet oral, daily, 28 tablets 2 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
 Requested (qualifier value)|  
 topic: Postcoordinated Expression [416118004 |Administration  
 (procedure)] ->(260686004 |Method (attribute))->[129445006  
 |Administration - action (qualifier value)] ->(363701004 |  
 Direct substance (attribute))->[Rx;1734636 elbasvir 50 MG /  
 grazoprevir 100 MG Oral Tablet] ->(410675002 |Route of  
 administration (attribute))->[260548002 |Oral (qualifier value)]  
 unstructured[0]: 28 tablets 2 refills  
 requestedResult.lowerBound: 1  
 requestedResult.upperBound: 1  
 requestedResult.includeLowerBound: true  
 requestedResult.includeUpperBound: true  
 priority: Precoordinated Expression 50811001 |Routine  
 (qualifier value)|  
 repetition[0].periodDuration.lowerBound: 1  
 repetition[0].periodDuration.upperBound: 84  
 repetition[0].periodDuration.includeLowerBound: true  
 repetition[0].periodDuration.includeUpperBound: true  
 repetition[0].periodDuration.resolution: 1

repetition[0].periodDuration.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|  
 repetition[0].eventFrequency.lowerBound: 1  
 repetition[0].eventFrequency.upperBound: 1  
 repetition[0].eventFrequency.includeLowerBound: true  
 repetition[0].eventFrequency.includeUpperBound: true  
 repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|

Qualifications for the following treatment include: Genotype 4, Treatment-Experienced (PEG/RBV), without Cirrhosis or with Compensated Cirrhosis (CTP A).

---

# Elbasvir/grazoprevir (50 mg/100 mg) 1 tablet oral, daily, 28 tablets 3 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|  
 topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;1734636 elbasvir 50 MG / grazoprevir 100 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]  
 unstructured[0]: 28 tablets 3 refills  
 requestedResult.lowerBound: 1  
 requestedResult.upperBound: 1  
 requestedResult.includeLowerBound: true  
 requestedResult.includeUpperBound: true  
 priority: Precoordinated Expression 50811001 |Routine (qualifier value)|  
 repetition[0].periodDuration.lowerBound: 1  
 repetition[0].periodDuration.upperBound: 84  
 repetition[0].periodDuration.includeLowerBound: true  
 repetition[0].periodDuration.includeUpperBound: true  
 repetition[0].periodDuration.resolution: 1  
 repetition[0].periodDuration.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|  
 repetition[0].eventFrequency.lowerBound: 1  
 repetition[0].eventFrequency.upperBound: 1  
 repetition[0].eventFrequency.includeLowerBound: true  
 repetition[0].eventFrequency.includeUpperBound: true  
 repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|

# Ribavirin 200 mg capsule oral, take 2 capsules every morning and 3 capsules every evening; take with food 140 capsules 3 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

```

statementType: Precoordinated Expression 385644000 |
Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration
(procedure)] ->(260686004 |Method (attribute))->[129445006 |
Administration - action (qualifier value)] ->(363701004 |Direct
substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral
Capsule] ->(410675002 |Route of administration (attribute))-
>[260548002 |Oral (qualifier value)]

unstructured[0]: take 3 capsules every morning and 3 capsules
every evening; take with food; 140 capsules 3 refills

repetition[0].periodDuration.lowerBound: 1
repetition[0].periodDuration.upperBound: 112
repetition[0].periodDuration.includeLowerBound: true
repetition[0].periodDuration.includeUpperBound: true
repetition[0].periodDuration.resolution: 1
repetition[0].periodDuration.measureSemantic: Precoordinated
Expression 258703001 |day (qualifier value)|

# Ribavirin 200 mg capsule oral, take 3 capsules every morning and 3 capsules every evening;
take with food 168 capsules 3 refills (routine)
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |
Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration
(procedure)] ->(260686004 |Method (attribute))->[129445006 |
Administration - action (qualifier value)] ->(363701004 |Direct
substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral
Capsule] ->(410675002 |Route of administration (attribute))-
>[260548002 |Oral (qualifier value)]

unstructured[0]: take 3 capsules every morning and 3 capsules
every evening; take with food; 168 capsules 3 refills

requestedResult.lowerBound: 3
requestedResult.upperBound: 3
requestedResult.includeLowerBound: true
requestedResult.includeUpperBound: true
requestedResult.measureSemantic: Precoordinated Expression
421026006 |Conventional release oral tablet (dose form)|

priority: Precoordinated Expression 50811001 |Routine
(qualifier value)|

repetition[0].periodDuration.lowerBound: 1
repetition[0].periodDuration.upperBound: 84
repetition[0].periodDuration.includeLowerBound: true
repetition[0].periodDuration.includeUpperBound: true
repetition[0].periodDuration.resolution: 1
repetition[0].periodDuration.measureSemantic: Precoordinated
Expression 258703001 |day (qualifier value)|

```

	repetition[0].eventFrequency.lowerBound: 1 repetition[0].eventFrequency.upperBound: 1 repetition[0].eventFrequency.includeLowerBound: true repetition[0].eventFrequency.includeUpperBound: true repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 3157002  Evening (qualifier value)
Qualifications for the following treatment include: Reduced-Dose Ribavirin for Patients with Renal Impairment (Creatinine Clearance 30–50 mL/min/1.73 m <sup>2</sup> ).	
# Ribavirin 200 mg capsule oral, take 1 capsule every other day, alternating with 2 capsules on alternate days; on 2-capsule days, take 1 capsule in the morning and one capsule in the evening; take with food 42 capsules 2 refills ( routine)	
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	statementType: Precoordinated Expression 385644000   Requested (qualifier value)   topic: Postcoordinated Expression [416118004  Administration (procedure)] ->(260686004  Method (attribute))->[129445006   Administration - action (qualifier value)] ->(363701004  Direct substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral Capsule] ->(410675002  Route of administration (attribute))- ->[260548002  Oral (qualifier value)]  unstructured[0]: take 1 capsule every other day, alternating with 2 capsules on alternate days; on 2-capsule days, take 1 capsule in the morning and one capsule in the evening; take with food 42 capsules 2 refills  requestedResult.measureSemantic: Precoordinated Expression 421026006  Conventional release oral tablet (dose form)   priority: Precoordinated Expression 50811001  Routine (qualifier value)   repetition[0].periodDuration.lowerBound: 1 repetition[0].periodDuration.upperBound: 84 repetition[0].periodDuration.includeLowerBound: true repetition[0].periodDuration.includeUpperBound: true repetition[0].periodDuration.resolution: 1 repetition[0].periodDuration.measureSemantic: Precoordinated Expression 258703001  day (qualifier value)   statementAssociation[0].statementId: 542f11a9-9eb6-4ff8- a1e2-18730f009b49  statementAssociation[1].statementId: 40380a63-e53e-439f- b344-2ed76e972366  # Ribavirin 200 mg capsule oral, take 1 capsule every other day, alternating with 2 capsules on alternate days; on 2-capsule days, take 1 capsule in the morning and one capsule in the evening; take with food 42 capsules 3 refills (routine)
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	statementType: Precoordinated Expression 385644000   Requested (qualifier value)



topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral Capsule] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]

unstructured[0]: take 1 capsule every other day, alternating with 2 capsules on alternate days; on 2-capsule days, take 1 capsule in the morning and one capsule in the evening; take with food 42 capsules 3 refills

requestedResult.measureSemantic: Precoordinated Expression 421026006 |Conventional release oral tablet (dose form)|

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

repetition[0].periodDuration.lowerBound: 1

repetition[0].periodDuration.upperBound: 84

repetition[0].periodDuration.includeLowerBound: true

repetition[0].periodDuration.includeUpperBound: true

repetition[0].periodDuration.resolution: 1

repetition[0].periodDuration.measureSemantic: Precoordinated Expression 258703001 |day (qualifier value)|

statementAssociation[0].statementId: 6121ecb0-9c74-48a1-aa06-17dd0c640919

statementAssociation[1].statementId: 6121ecb0-9c74-48a1-aa06-17dd0c640919

Qualifications for the following treatment include: Reduced-Dose Ribavirin for Patients with Renal Impairment (Creatinine Clearance < 30 mL/min/1.73 m<sup>2</sup>).

# Ribavirin 200 mg capsule oral, take 1 capsule daily with food 28 capsules 2 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral Capsule] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]

unstructured[0]: take with food. 28 capsules 2 refills

requestedResult.lowerBound: 1

requestedResult.upperBound: 1

requestedResult.includeLowerBound: true

requestedResult.includeUpperBound: true

requestedResult.resolution: Precoordinated Expression 420692007 |Conventional release oral capsule (dose form)|

priority: Precoordinated Expression 50811001 |Routine  
 (qualifier value)|  
 repetition[0].periodDuration.lowerBound: 1  
 repetition[0].periodDuration.upperBound: 84  
 repetition[0].periodDuration.includeLowerBound: true  
 repetition[0].periodDuration.includeUpperBound: true  
 repetition[0].periodDuration.resolution: 1  
 repetition[0].periodDuration.measureSemantic: Precoordinated  
 Expression 258703001 |day (qualifier value)|  
 repetition[0].eventFrequency.lowerBound: 1  
 repetition[0].eventFrequency.upperBound: 1  
 repetition[0].eventFrequency.includeLowerBound: true  
 repetition[0].eventFrequency.includeUpperBound: true  
 repetition[0].eventFrequency.measureSemantic:  
 Precoordinated Expression 258703001 |day (qualifier value)|  
 # Ribavirin 200 mg capsule oral, take 1 capsule daily with food 28 capsules 3 refills (routine)  
 actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]  
 statementType: Precoordinated Expression 385644000 |  
 Requested (qualifier value)|  
 topic: Postcoordinated Expression [416118004 |Administration  
 (procedure)] ->(260686004 |Method (attribute))->[129445006 |  
 Administration - action (qualifier value)] ->(363701004 |Direct  
 substance (attribute))->[Rx;312817 Ribavirin 200 MG Oral  
 Capsule] ->(410675002 |Route of administration (attribute))-  
 >[260548002 |Oral (qualifier value)]  
 unstructured[0]: take with food. 28 capsules 3 refills  
 requestedResult.lowerBound: 1  
 requestedResult.upperBound: 1  
 requestedResult.includeLowerBound: true  
 requestedResult.includeUpperBound: true  
 requestedResult.resolution: Precoordinated Expression  
 420692007 |Conventional release oral capsule (dose form)|  
 priority: Precoordinated Expression 50811001 |Routine  
 (qualifier value)|  
 repetition[0].periodDuration.lowerBound: 1  
 repetition[0].periodDuration.upperBound: 112  
 repetition[0].periodDuration.includeLowerBound: true  
 repetition[0].periodDuration.includeUpperBound: true  
 repetition[0].periodDuration.resolution: 1  
 repetition[0].periodDuration.measureSemantic: Precoordinated  
 Expression 258703001 |day (qualifier value)|  
 repetition[0].eventFrequency.lowerBound: 1  
 repetition[0].eventFrequency.upperBound: 1

repetition[0].eventFrequency.includeLowerBound: true repetition[0].eventFrequency.includeUpperBound: true repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258703001  day (qualifier value)
---

---

# Chapter 4. Laboratory Tests

Guidance for providers who are referring a patient to gastroenterology for management of hepatitis C

---

# Complete blood count 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Precoordinated Expression 26604007 |Complete blood  
count (procedure)|

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

# Hepatic function panel 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Precoordinated Expression 26958001 |Hepatic function  
panel (procedure)|

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

# International normalized ratio 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Precoordinated Expression 440685005 |Calculation of  
international normalized ratio (procedure)|

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

# Basic metabolic panel 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Precoordinated Expression 1421000205106 |Basic  
metabolic panel (procedure)|

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

# Glomerular Filtration rate 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Precoordinated Expression 167181009 |Measurement of  
renal clearance of creatinine (procedure)|

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

Recommended if it has not been done for the past 5 years

**Condition:**elm:Not (elm:Exists( HCV genotype 1 time ))

# HCV genotype 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Precoordinated Expression 397662006 |Hepatitis C virus  
genotype determination (procedure)|

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

These tests are recommended if they have not been done for the past 10 years

**Condition:**elm:Not (elm:Exists( Hepatitis B surface antigen (HBsAg) 1 time ))

# Hepatitis B surface antigen (HBsAg) 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Precoordinated Expression 47758006 |Hepatitis B  
surface antigen measurement (procedure)|

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

**Condition:**elm:Not (elm:Exists( Hepatitis B core antibody (HBcAb) 1 time ))

# Hepatitis B core antibody (HBcAb) 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Precoordinated Expression 59582004 |Hepatitis B core  
antibody measurement (procedure)|

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

**Condition:**elm:Not (elm:Exists( Hepatitis B surface antibody (HBsAb) 1 time ))

# Hepatitis B surface antibody (HBsAb) 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Precoordinated Expression 65911000 |Hepatitis B  
surface antibody measurement (procedure)|

priority: Precoordinated Expression 50811001 |Routine  
(qualifier value)|

**Condition:**elm:Not (elm:Exists( Hepatitis A antibody (HAVAb) 1 time ))

# Hepatitis A antibody (HAVAb) 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Precoordinated Expression 697001 |Hepatitis A virus antibody measurement (procedure)|  
 priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

The following lab is recommended if not performed within the previous 6 months.

**Condition:**elm:Not (elm:Exists( HCV viral load (quantitative HCV RNA) 1 time ))

# HCV viral load (quantitative HCV RNA) 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 | Requested (qualifier value)|

topic: Precoordinated Expression 395197008 |Hepatitis C viral load (procedure)|

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

The following lab is recommended if not performed within the previous 5 years.

**Condition:**elm:Not (elm:Exists( HIV test 1 time ))

# HIV test 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 | Requested (qualifier value)|

topic: Precoordinated Expression 359796005 |Measurement of both Human immunodeficiency virus 1 antibody and Human immunodeficiency virus 2 antibody (procedure)|

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

**Condition:**elm:Not (elm:Exists( Resistance-associated substitutions 1 time ))

# Resistance-associated substitutions 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 | Requested (qualifier value)|

topic: Precoordinated Expression 8671fdfe-53a5-4cae-91a3-61fd23f5bbd4 |Analysis of resistance-associated substitutions in Hepatitis C virus genes (procedure)

priority: Precoordinated Expression 49499008 |Stat (qualifier value)|

The following lab is recommended if not performed within the previous 2 weeks.

**Condition:**elm:Not (elm:Exists( Qualitative human chorionic gonadotropin 1 time ))

# Qualitative human chorionic gonadotropin 1 time (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 | Requested (qualifier value)|

topic: Precoordinated Expression 386558001 |Chorionic gonadotropin, beta-subunit measurement (procedure)|

	priority: Precoordinated Expression 50811001  Routine (qualifier value)
--	--

---

# Chapter 5. Patient and Caregiver Education

This section should be available to users in gastroenterology settings and for primary care providers who are referring a patient to gastroenterology for management of hepatitis C

---

# Provide links to VA Hepatitis C patient education documents:

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |  
Requested (qualifier value)|

topic: Precoordinated Expression TSR-NoCode

([VA 2018a])

Hepatitis C Information for Veterans link [<https://www.hepatitis.va.gov>]

([VA 2017a])

Chronic Hepatitis C and Alcohol Use link [<https://www.hepatitis.va.gov/products/patient/hepatitisC-alcohol-brochure.asp>]

([VA 2017b])

What to Expect Before Your Treatment for Hepatitis C Virus link [<https://www.hepatitis.va.gov/products/patient/hepatitisC-pretreatment.asp>]

([VA 2017c])

Ribavirin: Information for Patients link [<https://www.hepatitis.va.gov/pdf/patient-ribavirin.pdf>]

([VA 2016a])

Taking Your Hepatitis C Therapy: Zepatier(TM) with or without Ribavirin link [<https://www.hepatitis.va.gov/pdf/patient-zepatier.pdf>]

([VA 2016b])

Managing Side Effects of Zepatier(TM) link [<https://www.hepatitis.va.gov/pdf/side-effects-zepatier.pdf>]

([VA 2016c])

Managing Side Effects of Zepatier(TM) + Ribavirin link [<https://www.hepatitis.va.gov/products/patient/side-effects-handouts.asp>]

([VA 2017d])

Tracking My Hepatitis C Treatment Results link [<https://www.hepatitis.va.gov/products/patient/tracking-chart.asp>]

([VA 2015])

FAQs about Sustained Virologic Response to Treatment for Hepatitis C link [<https://www.hepatitis.va.gov/pdf/sustained-virological-response.pdf>]



---

# Chapter 6. Tabular List

## *Terminology Service Request (TSR) Mappings*

**Table 6.1. Terminology Versions**

Name	Identifier	Version
SNOMED CT	2.16.840.1.113883.6.96	United States Edition 20180301

**Table 6.2. Terminology References**

System	Code	Display Text <sup>a</sup>	References <sup>b</sup>
SNOMED CT	133936004  Adult (person)	Adult patients with chronic Hepatitis C infection	1
SNOMED CT	1421000205106  Basic metabolic panel (procedure)	Precoordinated Expression	1
SNOMED CT	167181009  Measurement of renal clearance of creatinine (procedure)	Precoordinated Expression	1
SNOMED CT	258703001  day (qualifier value)	Precoordinated Expression	34
SNOMED CT	26604007  Complete blood count (procedure)	Precoordinated Expression	1
SNOMED CT	26958001  Hepatic function panel (procedure)	Precoordinated Expression	1
SNOMED CT	3157002  Evening (qualifier value)	Precoordinated Expression	3
SNOMED CT	33022008  Hospital-based outpatient department (environment)	Outpatient	1
SNOMED CT	359796005  Measurement of both Human immunodeficiency virus 1 antibody and Human immunodeficiency virus 2 antibody (procedure)	Precoordinated Expression	2
SNOMED CT	385644000  Requested (qualifier value)	Precoordinated Expression	36
SNOMED CT	386558001  Chorionic gonadotropin, beta-subunit measurement (procedure)	Precoordinated Expression	2
SNOMED CT	395197008  Hepatitis C viral load (procedure)	Precoordinated Expression	2
SNOMED CT	397662006  Hepatitis C virus genotype determination (procedure)	Precoordinated Expression	2

System	Code	Display Text <sup>a</sup>	References <sup>b</sup>
SNOMED CT	420692007  Conventional release oral capsule (dose form)	Precoordinated Expression	5
SNOMED CT	421026006  Conventional release oral tablet (dose form)	Precoordinated Expression	10
SNOMED CT	440685005  Calculation of international normalized ratio (procedure)	Precoordinated Expression	1
SNOMED CT	453231000124104  Primary care provider (occupation)	Primary Care physicians	1
SNOMED CT	47758006  Hepatitis B surface antigen measurement (procedure)	Precoordinated Expression	2
SNOMED CT	49499008  Stat (qualifier value)	Precoordinated Expression	2
SNOMED CT	50811001  Routine (qualifier value)	Precoordinated Expression	32
SNOMED CT	59582004  Hepatitis B core antibody measurement (procedure)	Precoordinated Expression	2
SNOMED CT	65911000  Hepatitis B surface antibody measurement (procedure)	Precoordinated Expression	2
SNOMED CT	697001  Hepatitis A virus antibody measurement (procedure)	Precoordinated Expression	2
SNOMED CT	73775008  Morning (qualifier value)	Precoordinated Expression	1
SNOMED CT	8671fdfe-53a5-4cae-91a3-61f2365b11d4  Analysis of resistance-associated substitutions in Hepatitis C virus genes (procedure)	Precoordinated Expression	2
SNOMED CT	TSR-NoCode <sup>c</sup>	Precoordinated Expression	1
SNOMED CT	[416118004  Administration (procedure)] ->(260686004  Method (attribute))->[129445006  Administration - action (qualifier value)] ->(363701004  Direct substance (attribute))->[Rx;1734636 elbasvir 50 MG / grazoprevir 100 MG	Postcoordinated Expression	7

System	Code	Display Text <sup>a</sup>	References <sup>b</sup>
	Oral Tablet] ->(410675002  Route of administration (attribute))->[260548002   Oral (qualifier value)]		
SNOMED CT	[416118004   Administration (procedure)] ->(260686004  Method (attribute))- >[129445006   Administration - action (qualifier value)] - >(363701004  Direct substance (attribute))- >[Rx;312817 Ribavirin 200 MG Oral Capsule] - >(410675002  Route of administration (attribute))- >[260548002  Oral (qualifier value)]	Postcoordinated Expression	15

<sup>a</sup>If a code is used multiple times in the KNART, only the display text of the first instance is shown.

<sup>b</sup>Count of the number of times the given code system and code pair is used in the KNART.

<sup>c</sup>TSR-NoCode is a placeholder indicating a code was requested, but was not provided.

---

# Chapter 7. Behavior Symbols

**Table 7.1. 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 7.2. 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 7.3. 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 7.4. 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 7.5. 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 7.6. 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 7.7. 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 - Elbasvir/Grazoprevir Order Set Conceptual Structure Document*

[KVRpt] *Gastroenterology: Hepatitis C - Elbasvir/Grazoprevir Order Set KNART Validation Report*

[VA 2018a] *Department of Veterans Affairs. (2018a). Viral hepatitis home. Retrieved May 03, 2018, from <https://www.hepatitis.va.gov/> (link [<https://www.hepatitis.va.gov/>])*

[VA 2017a] *Department of Veterans Affairs. (2017a). Chronic hepatitis C and alcohol use. Retrieved May 03, 2018, from <https://www.hepatitis.va.gov/products/patient/hepatitisC-alcohol-brochure.asp> (link [<https://www.hepatitis.va.gov/products/patient/hepatitisC-alcohol-brochure.asp>])*

[VA 2017b] *Department of Veterans Affairs. (2017b). What to expect before your treatment for hepatitis C virus. Retrieved May 03, 2018, from <https://www.hepatitis.va.gov/products/patient/hepatitisC-pretreatment.asp> (link [<https://www.hepatitis.va.gov/products/patient/hepatitisC-pretreatment.asp>])*

[VA 2017c] *Department of Veterans Affairs. (2017c). Ribavirin information for patients. Retrieved May 03, 2018, from <https://www.hepatitis.va.gov/pdf/patient-ribavirin.pdf> (link [<https://www.hepatitis.va.gov/pdf/patient-ribavirin.pdf>])*

[VA 2016a] *Department of Veterans Affairs. (2016a). Taking your hepatitis C therapy: Zepatier™ with or without ribavirin. Retrieved May 03, 2018, from <https://www.hepatitis.va.gov/pdf/patient-zepatier.pdf> (link [<https://www.hepatitis.va.gov/pdf/patient-zepatier.pdf>])*

[VA 2016b] *Department of Veterans Affairs. (2016b). Managing side effects of zepatier™. Retrieved May 03, 2018, from <https://www.hepatitis.va.gov/pdf/side-effects-zepatier.pdf> (link [<https://www.hepatitis.va.gov/pdf/side-effects-zepatier.pdf>])*

[VA 2016c] *Department of Veterans Affairs. (2016c). Managing side effects of zepatier(TM) + ribavirin. Retrieved May 03, 2018, from <https://www.hepatitis.va.gov/pdf/side-effects-zepatier-ribavirin.pdf> (link [<https://www.hepatitis.va.gov/products/patient/side-effects-handouts.asp>])*

[VA 2017d] *Department of Veterans Affairs. (2017d). Tracking my hepatitis C treatment results. Retrieved May 03, 2018, from <https://www.hepatitis.va.gov/products/patient/tracking-chart.asp> (link [<https://www.hepatitis.va.gov/products/patient/tracking-chart.asp>])*

[VA 2015] *Department of Veterans Affairs. (2015). FAQs about sustained virologic response to treatment for hepatitis C. Retrieved May 03, 2018, from <https://www.hepatitis.va.gov/pdf/sustained-virological-response.pdf> (link [<https://www.hepatitis.va.gov/pdf/sustained-virological-response.pdf>])*

[Back 2018] *Back, D., et al. (2018). HEP drug interactions. Retrieved Apr 16, 2018, from <https://www.hep-druginteractions.org/> (link [<http://www.hep-druginteractions.org/>])*

## 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 2017e] *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>])
- [Morgan 2017] *Morgan, T., & Yee, H. (2017). Chronic hepatitis C virus (HCV) infection: Treatment considerations. Retrieved Apr 22, 2018, 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 2017c] *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 2017d] *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 2016d] *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 2016e] *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/>])