

# **Gastroenterology: Colorectal Cancer Risk Documentation Template**

## **Documentation Tem- plate: Conceptual Structure**

**Contract: VA118-16-D-1008, Task Order (TO): VA-118-16-F-1008-0007, CLIN0005AF**

**Department of Veterans Affairs (VA)**



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

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

Publication date 05/31/2018

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# Preface

**Table 1. Revision History**

Date	Life Cycle Event
May 31, 2018	Published
May 31, 2018	Reviewed
April 24, 2018	Created
April 24, 2018	Pre-published

**Table 2. Clinical White Paper Contributors**

Name	Role	Affiliation
Jason Dominitz, MD MHS	Author	National Gastroenterology Program Director, Department of Veteran Affairs (VA) Puget Sound Health Care System, Seattle, WA
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**Table 3. Artifact Identifier**

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:rl	c9e94434-c685-5a5b-af50-29d0406e3894	B42

---

# Artifact Applicability

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

Focus	Description	Code System	Code	Value Set	Value Set Version
TargetUser	Primary Care Provider	SNOMED CT	453231000124104  Primary care provider (occupation)	N/A	N/A
PatientAgeGroup	Adult	SNOMED CT	133936004  Adult (person)	N/A	N/A
ClinicalFocus	Colorectal Cancer Screening, Diagnostic Evaluation, or Surveillance			N/A	N/A
WorkflowSetting	Primary Care			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. Guaiac-Based Fecal Occult Blood Test**

Expression: type=elm:Instance Annotation: Codes: elm:value[elm:Code]: [398166005  Performed (qualifier value)]elm:value[elm:Code]: [442554004  Guaiac test for occult blood in feces specimen (procedure)]
---

**Table 1.2. Fecal Immunochemical Test**

Expression: type=elm:Instance Annotation: Codes: elm:value[elm:Code]: [398166005  Performed (qualifier value)]elm:value[elm:Code]: [441579003  Measurement of occult blood in stool specimen using immunoassay (procedure)]
--

**Table 1.3. Stool DNA Test**

Expression: type=elm:Instance Annotation: Codes: elm:value[elm:Code]: [398166005  Performed (qualifier value)]elm:value[elm:Code]: [163925a8-8c77-4832-8d57-00be4f5764d5  Stool deoxyribonucleic acid testing (procedure)]
---

**Table 1.4. Double-Contrast Barium Enema**

Expression: type=elm:Instance Annotation: Codes: elm:value[elm:Code]: [398166005  Performed (qualifier value)]elm:value[elm:Code]: [241164003  Double contrast barium enema (procedure)]
---

**Table 1.5. Double-Contrast Barium Enema Report**

Expression: type=elm:Instance Annotation: Codes: elm:value[elm:Code]: [398166005  Performed (qualifier value)]elm:value[elm:Code]: [TSR- NoCode]
---

**Table 1.6. Computed Tomography (CT) Colonography**

Expression: type=elm:Instance Annotation: Codes: elm:value[elm:Code]: [398166005  Performed (qualifier value)]elm:value[elm:Code]: [425666002  Computed tomography of colon (procedure)]
---

**Table 1.7. Computed Tomography Report**

Expression: type=elm:Instance
-------------------------------



Annotation:  
 Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)]elm:value[elm:Code]: [TSR-NoCode]

**Table 1.8. Flexible Sigmoidoscopy**

Expression: type=elm:Instance  
 Annotation:  
 Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)]elm:value[elm:Code]: [367535003 |Fiberoptic colonoscopy (procedure)]

**Table 1.9. Flexible Sigmoidoscopy Report**

Expression: type=elm:Instance  
 Annotation:  
 Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)]elm:value[elm:Code]: [TSR-NoCode]

**Table 1.10. Colonoscopy**

Expression: type=elm:Instance  
 Annotation:  
 Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)]elm:value[elm:Code]: [73761001 |Colonoscopy (procedure)]

**Table 1.11. Colonoscopy Report**

Expression: type=elm:Instance  
 Annotation:  
 Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)]elm:value[elm:Code]: [TSR-NoCode]

**Table 1.12. Pathology**

Expression: type=elm:Instance  
 Annotation:  
 Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)]elm:value[elm:Code]: [TSR-NoCode]

**Table 1.13. Pathology Report**

Expression: type=elm:Instance  
 Annotation:  
 Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)]elm:value[elm:Code]: [TSR-NoCode]

**Table 1.14. Esophagogastroduodenoscopy**

Expression: type=elm:Instance

Annotation:  
 Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)]elm:value[elm:Code]: [76009000 |Esophagogastroduodenoscopy (procedure)]

**Table 1.15. Esophagogastroduodenoscopy Report**

Expression: type=elm:Instance  
 Annotation:  
 Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)]elm:value[elm:Code]: [TSR-NoCode]

**Table 1.16. Current Medication List**

Expression: type=elm:Instance  
 Annotation:  
 Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)]elm:value[elm:Code]: [TSR-NoCode]

**Table 1.17. Lab test results**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
 Annotation:  
 Codes: elm:element[elm:Code]: [26604007 |Complete blood count (procedure)]elm:element[elm:Code]: [42950004 |Iron measurement (procedure)]elm:element[elm:Code]: [489004 |Ferritin measurement (procedure)]elm:element[elm:Code]: [359979000 |Total iron binding capacity measurement (procedure)]

### Triggers

No trigger definitions are present.

---

# Chapter 2. Expression Definitions

No expression definitions are present.

---

## Chapter 3. Reason for Presentation

⊙ prompt: Chief Complaint

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] -  
>(363702006 |Has focus (attribute))->[33962009 |Chief complaint (finding)]

response: String (Single)

⊙ prompt: Additional Details

response: String (Single)

---

# Chapter 4. Reason for Consult

- ⊙ Positive Finding on Most Recent Stool Test
  - prompt: Collect Age (years)
  - response: Integer (Single)
- ⊙ Abnormal Finding on Most Recent Colorectal Imaging
  - prompt: Collect Age (years)
  - response: Integer (Single)
- ⊙ Abnormal Finding on Most Recent Flexible Sigmoidoscopy
  - prompt: Collect Age (years)
  - response: Integer (Single)
- ⊙ Abnormal Finding on Most Recent Colonoscopy
  - prompt: Collect Age (years)
  - response: Integer (Single)
- ⊙ Personal History of Colorectal Polyp
  - prompt: Collect Age (years)
  - response: Integer (Single)
- ⊙ Personal History of Colorectal Cancer
  - prompt: Collect Age (years)
  - response: Integer (Single)
- ⊙ Family History of Colon Cancer, Colon Cancer Syndrome or Advanced Adenoma
  - prompt: Collect Age (years)
  - response: Integer (Single)
- ⊙ Inflammatory Bowel Disease
  - prompt: Collect Age (years)
  - response: Integer (Single)
- ⊙ Gastrointestinal Bleeding
  - prompt: Collect Age (years)
  - response: Integer (Single)
- ⊙ Iron Deficiency Anemia. Iron deficiency anemia may be a symptom of colon cancer. It must be considered in combination with other clinical factors, such as unintentional weight loss, changes in bowel habits, visible blood in the stool, and recent hemoglobin lab test results.
  - prompt: Collect Age (years)
  - response: Integer (Single)
- ⊙ prompt: Additional Details
  - response: String (Single)

---

# Chapter 5. Colorectal Cancer Screening: Average Risk Patient

- ⊗ Guaiac-Based Fecal Occult Blood Test

- prompt: Collect Date

- response: Timestamp (Single)

- initialValue:** elm:Property Guaiac-Based Fecal Occult Blood Test

- ⊗ Fecal Immunochemical Test

- prompt: Collect Date

- response: Timestamp (Single)

- initialValue:** elm:Property Fecal Immunochemical Test

- ⊗ Stool DNA Test

- prompt: Collect Date

- response: Timestamp (Single)

- ⊗ Double-Contrast Barium Enema

- prompt: Collect Date

- response: Timestamp (Single)

- initialValue:** elm:Property Double-Contrast Barium Enema

- ⊗ Computed Tomography (CT) Colonography

- prompt: Collect Date

- response: Timestamp (Single)

- initialValue:** elm:Property Computed Tomography (CT) Colonography

- ⊗ Flexible Sigmoidoscopy

- prompt: Collect Date

- response: Timestamp (Single)

- initialValue:** elm:Property Flexible Sigmoidoscopy

- ⊗ Colonoscopy

- prompt: Collect Date

- response: Timestamp (Single)

- initialValue:** elm:Property Colonoscopy

- ⊗ No Prior Screening

- prompt:

- response: Boolean (Single)

- ⊗ Additional Details?

- prompt:

- response: String (Single)

---

# Chapter 6. Colorectal Cancer Screening Diagnostics: Follow-up Positive Stool Test

- ⊗ Guaiac-Based Fecal Occult Blood Test

- prompt: Collect Date

- response: Timestamp (Single)

- initialValue:** elm:Property Guaiac-Based Fecal Occult Blood Test

- ⊗ Fecal Immunochemical Test

- prompt: Collect Date

- response: Timestamp (Single)

- ⊗ Stool DNA Test

- prompt: Collect Date

- response: Timestamp (Single)

- initialValue:** elm:Property Stool DNA Test

- ⊗ Additional Details?

- prompt:

- response: String (Single)

# Chapter 7. Colorectal Cancer

## Diagnostics: Positive Imaging

### Screening Test

⊙	<div>Double-Contrast Barium Enema</div> <div>           ⊙ prompt: Double-Contrast Barium Enema            response: Tuple (Single)         </div> <div> <b>initialValue:</b> Double-Contrast Barium Enema         </div> <div>           ⊙ prompt: Collect Date            response: Timestamp (Single)         </div> <div> <b>initialValue:</b> elm:Property Double-Contrast Barium Enema         </div>
⊙	<div>           ⊙ prompt: Adequacy of Bowel Preparation            response: Code (Single)         </div> <div>           response range: EnumerationConstraint (List)           <div>             item: Adequate([a997cc03-3e99-40eb-833a-6374c7750a3a  Observation procedure (procedure)] -&gt;(363702006  Has focus (attribute)))-&gt;[703141002  Effective bowel preparation for procedure (finding)])             <div>               item: Inadequate([a997cc03-3e99-40eb-833a-6374c7750a3a  Observation procedure (procedure)] -&gt;(363702006  Has focus (attribute)))-&gt;[413261003  Inadequate bowel preparation (finding)])             </div> </div> </div> <div>           Attach or Link to Full Report: Double-Contrast Barium Enema Report         </div> <div>           ⊙ prompt: Double-Contrast Barium Enema Report            response: Tuple (Single)         </div> <div> <b>initialValue:</b> Double-Contrast Barium Enema Report         </div> <div>           Attach or link Images: Double-Contrast Barium Enema Images         </div> <div>           ⊙ prompt: Double-Contrast Barium Enema Images            response: Tuple (Multiple)         </div> <div> <b>initialValue:</b> Double-Contrast Barium Enema         </div>
⊙	<div>⊙ Computed Tomography</div> <div>           prompt: Collect Date            response: Timestamp (Single)         </div> <div>           ⊙           <div>             ⊙ prompt: Adequacy of Bowel Preparation              response: Code (Single)           </div> <div>             response range: EnumerationConstraint (List)           </div> </div>



Colorectal Cancer Diagnostics:  
Positive Imaging Screening Test

		<div>item: Adequate([a997cc03-3e99-40eb-833a-6374c7750a3a  Observation procedure (procedure)] -&gt;(363702006  Has focus (attribute)))-&gt;[703141002  Effective bowel preparation for procedure (finding)])</div> <div>item: Inadequate([a997cc03-3e99-40eb-833a-6374c7750a3a  Observation procedure (procedure)] -&gt;(363702006  Has focus (attribute)))-&gt;[413261003  Inadequate bowel preparation (finding)])</div> <div>Attach or Link to Full Report: Computed Tomography Report</div>
		<div>⊙ prompt: Computed Tomography Report</div> <div>response: Tuple (Single)</div> <div><b>initialValue:</b> Computed Tomography Report</div> <div>Attach or Link Images: Computed Tomography Images</div>
		<div>⊙ prompt: Computed Tomography Images</div> <div>response: Tuple (Multiple)</div>
⊙ Additional Details?		
prompt:		
re- String (Single)		
sponse:		

---

# Chapter 8. Follow-up Abnormal Flexible Sigmoidoscopy

⊙	⊙ Flexible Sigmoidoscopy
	prompt: Collect Date
	response: Timestamp (Single)
	⊙
	⊙ prompt: Adequacy of Bowel Preparation
	response: Code (Single)
	response range: EnumerationConstraint (List)
	item: Adequate([a997cc03-3e99-40eb-833a-6374c7750a3a   Observation procedure (procedure)] ->(363702006  Has focus (attribute))>[703141002  Effective bowel preparation for procedure (finding)])
	item: Inadequate([a997cc03-3e99-40eb-833a-6374c7750a3a   Observation procedure (procedure)] ->(363702006  Has focus (attribute))>[413261003  Inadequate bowel preparation (finding)])
	Attach or Link to Full Report: Flexible Sigmoidoscopy Report
	⊙ prompt: Flexible Sigmoidoscopy Report
	response: Tuple (Single)
	<b>initalValue:</b> Flexible Sigmoidoscopy Report
	Attach or Link Images: Flexible Sigmoidoscopy Images
	⊙ prompt: Flexible Sigmoidoscopy Images
	response: Tuple (Multiple)
	<b>initalValue:</b> Flexible Sigmoidoscopy
	⊙ prompt: Additional Details?
	response: String (Single)

---

# Chapter 9. Follow-up Abnormal Colonoscopy

⊙ Most Recent Colonoscopy

prompt: Collect Date

response: Timestamp (Single)

Attach or Link to Full Report: Colonoscopy Report

---

⊙ prompt: Colonoscopy Report

response: Tuple (Single)

**initialValue:** Colonoscopy Report

Attach or Link Images: Colonoscopy Images

---

⊙ prompt: Colonoscopy Images

response: Tuple (Multiple)

**initialValue:** Colonoscopy

⊙ If the Colonoscopy Report Is Not Available, please provide as much Information as possible regarding key findings, including: Adequacy of Bowel Preparation, Depth of Insertion, Any Abnormalities (e.g., Polyps or Masses), and Any Sedation Requirements for Patient.

prompt: Additional Details?

response: String (Single)

---

# Chapter 10. Personal History of Colorectal Polyp

Represented Concepts: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->[363702006 |Has focus (attribute)]->[33962009 |Chief complaint (finding)]

## ◎ Personal History of Colorectal Polyp

prompt: Select Response:

response: Code (Single)

response EnumerationConstraint (List)

range:

item: No Polyps

item: Hyperplastic Polyps < 10 mm in Rectum or Sigmoid(TSR-NoCode)

item: >= 1 and <= 2 Tubular Adenomas < 10 mm(TSR-NoCode)

item: >= 1 and <= 10 Tubular Adenomas(TSR-NoCode)

item: > 10 Adenomas

item: >= 1 Tubular Adenomas >= 10 mm(TSR-NoCode)

item: >= 1 Villous Adenoma(TSR-NoCode)

item: Adenoma with High-Grade Dysplasia(TSR-NoCode)

item: Serrated Lesions: >= 1 Sessile Serrated Polyp < 10 mm without Dysplasia(TSR-NoCode)

item: Serrated Lesions: >= 1 Sessile Serrated Polyp >= 10 mm(TSR-NoCode)

item: Serrated Lesions: Sessile Serrated Polyp with Dysplasia(TSR-NoCode)

item: Serrated Lesions: Traditional Serrated Adenoma(TSR-NoCode)

item: Serrated Polyposis Syndrome(TSR-NoCode)

## ◎ Baseline Pathology

prompt: Collect Date

response: Timestamp (Single)

## ◎ prompt: Additional Details?

response: String (Single)

Attach or Link to Full Report: Pathology Report

---

## ◎ prompt: Pathology Report

response: Tuple (Single)

**initialValue:** Pathology Report

Attach or Link Images: Pathology Images

---

## ◎ prompt: Pathology Images

response: Tuple (Multiple)

**initialValue:** Pathology

## ◎ Baseline Polypectomy

prompt: Collect Date

response: Timestamp (Single)

⊙ prompt: Additional Details?

response: String (Single)

⊙ Baseline Colonoscopy

prompt: Collect Date

response: Timestamp (Single)

Attach or Link to Full Report: Colonoscopy Report

---

⊙ prompt: Colonoscopy Report

response: Tuple (Single)

Attach or Link Images: Colonoscopy Images

---

⊙ prompt: Colonoscopy Images

response: Tuple (Multiple)

⊙ prompt: First Surveillance Colonoscopy Performed?

response: Boolean (Single)

⊙ prompt: If Yes, Obtain Date

response: Timestamp (Single)

Attach or Link to Full Report: Colonoscopy Report

---

⊙ prompt: Colonoscopy Report

response: Tuple (Single)

**initialValue:** Colonoscopy Report

Attach or Link Images: Colonoscopy Images

---

⊙ prompt: Colonoscopy Images

response: Tuple (Multiple)

**initialValue:** Colonoscopy

⊙ prompt: Second Surveillance Colonoscopy Preformed?

response: Boolean (Single)

⊙ prompt: If Yes, Obtain Date

response: Timestamp (Single)

Attach or Link to Full Report: Colonoscopy Report

---

⊙ prompt: Colonoscopy Report

response: Tuple (Single)

**initialValue:** Colonoscopy Report

Attach or Link Images: Colonoscopy Images

---

⊙ prompt: Colonoscopy Images

response: Tuple (Multiple)

**initialValue:** Colonoscopy

⊙ prompt: Surveillance Completed?

response: Boolean (Single)

⊙ prompt: Additional Details?

response: String (Single)

---

# Chapter 11. Personal History of Colorectal Cancer

Represented Concepts: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->[363702006 |Has focus (attribute)]->[363510005 |Malignant tumor of large intestine (disorder)]

⊙ Follow-up Personal History of Colorectal Cancer
<div>⊙ prompt: Diagnosis response: String (Single)</div> <div>⊙ prompt: Date of Diagnosis response: Timestamp (Single)</div> <div>⊙ prompt: Colorectal Cancer Resection Performed? response: Boolean (Single)</div> <div>⊙ prompt: Collect Date response: Timestamp (Single)</div> <div>⊙ prompt: Colorectal Cancer Resection Clearing Colonoscopy Performed? response: Boolean (Single)</div> <div>⊙ prompt: Collect Date response: Timestamp (Single)</div> <div>Attach or Link to Full Report: Colonoscopy Report</div>
<div>⊙ prompt: Colonoscopy Report response: Tuple (Single)</div> <div><b>initalValue:</b> Colonoscopy Report</div> <div>Attach or Link Images: Colonoscopy Images</div>
<div>⊙ prompt: Colonoscopy Images response: Tuple (Multiple)</div> <div><b>initalValue:</b> Colonoscopy</div>
⊙ First Follow-up Colonoscopy Performed?
<div>⊙ Recommended surveillance interval: Follow-Up Colonoscopy at 1 Year after Colorectal Cancer Resection Clearing. <div>prompt: First Follow-up Colonoscopy Performed? response: Boolean (Single)</div></div> <div>⊙ prompt: Collect Date response: Timestamp (Single)</div> <div>Attach or Link to Full Report: Colonoscopy Report</div>
<div>⊙ prompt: Colonoscopy Report response: Tuple (Single)</div> <div><b>initalValue:</b> Colonoscopy Report</div> <div>Attach or Link Images: Colonoscopy Images</div>

	<p>⊗ prompt: Colonoscopy Images response: Tuple (Multiple)</p>
⊗	<p><b>initalValue:</b> Colonoscopy</p>
⊗	<p>Second Surveillance Colonoscopy Performed?</p>
	<p>⊗ Recommended surveillance interval: Follow-up Colonoscopy at 3 Years after First Surveillance Colonoscopy for Colorectal Cancer Resection.</p>
	<p>prompt: Second Surveillance Colonoscopy Performed?</p>
	<p>response: Boolean (Single)</p>
	<p>⊗ prompt: Collect Date</p>
	<p>response: Timestamp (Single)</p>
	<p>Attach or Link to Full Report: Colonoscopy Report</p>
	<p>⊗ prompt: Colonoscopy Report</p>
	<p>response: Tuple (Single)</p>
	<p><b>initalValue:</b> Colonoscopy Report</p>
	<p>Attach or Link Images: Colonoscopy Images</p>
	<p>⊗ prompt: Colonoscopy Images</p>
	<p>response: Tuple (Multiple)</p>
	<p><b>initalValue:</b> Colonoscopy</p>
⊗	<p>Third Surveillance Colonoscopy Performed?</p>
	<p>⊗ Recommended surveillance interval: Follow-up Colonoscopy at 5 Years after Second Surveillance Colonoscopy for Colorectal Cancer Resection.</p>
	<p>prompt: Third Surveillance Colonoscopy Performed?</p>
	<p>response: Boolean (Single)</p>
	<p>⊗ prompt: Collect Date</p>
	<p>response: Timestamp (Single)</p>
	<p>Attach or Link to Full Report: Colonoscopy Report</p>
	<p>⊗ prompt: Colonoscopy Report</p>
	<p>response: Tuple (Single)</p>
	<p><b>initalValue:</b> Colonoscopy Report</p>
	<p>Attach or Link Images: Colonoscopy Images</p>
	<p>⊗ prompt: Colonoscopy Images</p>
	<p>response: Tuple (Multiple)</p>
	<p><b>initalValue:</b> Colonoscopy</p>
⊗	<p>Subsequent Surveillance Completed?</p>
	<p>⊗ Recommended surveillance interval: Follow-Up Colonoscopy at 5 Years after Third Surveillance Colonoscopy for Colorectal Cancer Resection</p>
	<p>prompt: Subsequent Surveillance Completed?</p>
	<p>response: Boolean (Multiple)</p>
	<p>⊗ prompt: Collect Date</p>
	<p>response: Timestamp (Single)</p>
	<p>Attach or Link to Full Report: Colonoscopy Report</p>

	<div>Ⓢ prompt: Colonoscopy Report</div> <div>response: Tuple (Single)</div> <div><b>initialValue:</b> Colonoscopy Report</div> <div>Attach or Link Images: Colonoscopy Images</div>
	<div>Ⓢ prompt: Colonoscopy Images</div> <div>response: Tuple (Multiple)</div> <div><b>initialValue:</b> Colonoscopy</div> <div>Ⓢ prompt: Surveillance Completed?</div> <div>response: Boolean (Single)</div> <div>Ⓢ prompt: Additional Details?</div> <div>response: String (Single)</div>



# Chapter 12. Family History of Colon Cancer, Colon Cancer Syndrome or Advanced Adenoma

© Refer to Table 5

([ReColorectal cancer screening: recommendations for physicians and patients from the U.S. Multi-Society Task Force on Colorectal Cancer link [https://doi.org/10.1053/j.gastro.2017.05.013]

© Refer to Table 10

([GiGuidelines on genetic evaluation and management of Lynch syndrome: a consensus statement by a- the US Multi-Society Task Force on colorectal cancer. link [https://doi.org/10.1038/ajg.2014.186]rdiel- lo 2014))

©

Represented Concepts: a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[716318002 |Lynch syndrome (disorder)]

☐ Patient Personal or Family History of Lynch Syndrome?

prompt: Youngest Age at Diagnosis of Youngest Affected individual (Years). Screening Start Age (Years)” if “Youngest Age at Diagnosis (Years)” is  $\geq 25$ .

response: String (Single)

☐

☐ prompt: Screening Start Age (Years) for this patient.  
response: String (Single)

☐

Represented Concepts: [a997cc03-3e99-40eb-833a-6374c7750a3a | Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[b1ad8fa9-668d-4191-930f-eebfdf13a914 |Familial Colorectal Cancer Type X (disorder)]

☐ Family History of Colon Cancer Syndrome Type X?

prompt: Youngest Age at Diagnosis of Youngest Affected Individual (Years)

response: String (Single)

☐ One First-Degree Relative Diagnosed with Colorectal Cancer or Advanced Adenoma?

prompt: Age at Diagnosis (Years)

response: String (Single)

☐ Multiple First-Degree Relatives Diagnosed with Colorectal Cancer or Advanced Adenoma

prompt: Youngest Age at Diagnosis of Youngest Affected Individual (Years)

response: String (Single)

Family History of Colon  
Cancer, Colon Cancer Syn-  
drome or Advanced Adenoma

		<input type="checkbox"/> prompt: Additional Details? response: String (Single)
--	--	---

---

# Chapter 13. Inflammatory Bowel Disease

Represented Concepts: [a997cc03-3e99-40eb-833a-6374c7750a3a | Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[24526004 |Inflammatory bowel disease (disorder)]

☐ Diagnosis

prompt:

re- String (Single)

sponse:

☐

☐ prompt: Date of Diagnosis  
response: Timestamp (Single)

☐ Most recent colonoscopy

☐ prompt: Date of most recent colonoscopy  
response: Timestamp (Single)

Attach or Link to Full Report: Colonoscopy Report

☐ prompt: Colonoscopy Report  
response: Tuple (Single)

**initalValue:** Colonoscopy Report

Attach or Link Images: Colonoscopy Images

☐ prompt: Colonoscopy Images  
response: Tuple (Multiple)

**initalValue:** Colonoscopy

☐ prompt: Was Inflammatory Bowel Disease (IBD) dysplasia found on colonoscopy?  
response: Code (Single)

response range: EnumerationConstraint (List)

item: No dysplasia(TSR-NoCode)

item: Low grade dysplasia([a997cc03-3e99-40eb-833a-6374c7750a3a | Observation procedure (procedure)]- ->(363702006 |Has focus (attribute))->[107674006 |Cytologic finding (finding)]- ->(116676008 |Associated morphology (attribute))->[43185009 |Mild dysplasia (morphologic abnormality)]);)

item: High grade dysplasia([a997cc03-3e99-40eb-833a-6374c7750a3a | Observation procedure (procedure)]- ->(363702006 |Has focus (attribute))->[107674006 |Cytologic finding (finding)]- ->(116676008 |Associated morphology (attribute))->[55237006 |Severe dysplasia (morphologic abnormality)]);)

☐ prompt: Were polyps found on the most recent colonoscopy?  
response: Code (Single)

response range: EnumerationConstraint (List)

item: No Polyps

item: Hyperplastic Polyps < 10 mm in Rectum or Sigmoid(TSR-NoCode)  
item:  $\geq 1$  and  $\leq 2$  Tubular Adenomas < 10 mm(TSR-NoCode)  
item:  $\geq 1$  and  $\leq 10$  Tubular Adenomas(TSR-NoCode)  
item: > 10 Adenomas(TSR-NoCode)  
item:  $\geq 1$  Tubular Adenomas  $\geq 10$  mm(TSR-NoCode)  
item:  $\geq 1$  Villous Adenoma  
item: Adenoma with High-Grade Dysplasia(TSR-NoCode)  
item: Serrated Lesions:  $\geq 1$  Sessile Serrated Polyp < 10 mm without Dysplasia(TSR-NoCode)  
item: Serrated Lesions:b.  $\geq 1$  Sessile Serrated Polyp  $\geq 10$  mm(TSR-NoCode)  
item: Serrated Lesions: Sessile Serrated Polyp with Dysplasia(TSR-NoCode)  
item: Serrated Lesions: Traditional Serrated Adenoma(TSR-NoCode)  
item: Serrated Polyposis Syndrome(TSR-NoCode)

☐ Surveillance Start Age

prompt: Surveillance Start Age (Years)

re- String (Single)

sponse:

☐ Additional Details?

prompt:

re- String (Single)

sponse:

# Chapter 14. Pertinent History

## ⊙ Signs and Symptoms

⊙ prompt: Unintentional Weight Loss

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[448765001 |Unintentional weight loss (finding)]

response: Boolean (Single)

⊙ prompt: Change in Bowel Habits

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[88111009 |Altered bowel function (finding)]

response: Boolean (Single)

⊙ prompt: Visible Blood in Stool

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[405729008 |Hematochezia (finding)]

response: Boolean (Single)

⊙ prompt: Significant Lower Tract Bleeding

response: Boolean (Single)

⊙ prompt: Minor Lower Tract Bleeding

response: Boolean (Single)

⊙ prompt: Occult Blood

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[59614000 |Occult blood in stools (finding)]

response: Boolean (Single)

⊙ prompt: Abdominal Pain

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[21522001 |Abdominal pain (finding)]

response: Boolean (Single)

⊙ prompt: Anemia

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[271737000 |Anemia (disorder)]

response: Boolean (Single)

⊙ prompt: Details?

response: String (Single)

## ⊙ Diagnostic Procedures

⊙

⊙ ❖ Prior Colonoscopies?

prompt: Date

⊙		response: Timestamp (Single) Attach or Link to Full Report: Colonoscopy Report
		⊙ prompt: Colonoscopy Report response: Tuple (Single) <b>initalValue:</b> Colonoscopy Report Attach or Link Images: Colonoscopy Images
		⊙ prompt: Colonoscopy Images response: Tuple (Multiple) <b>initalValue:</b> Colonoscopy
	⊙	
	⊙ ❖ Prior Esophagogastroduodenoscopies?	prompt: Date response: Timestamp (Single) Attach or Link to Full Report: Esophagogastroduodenoscopy Report
		⊙ prompt: Esophagogastroduodenoscopy Report response: Tuple (Single) <b>initalValue:</b> Esophagogastroduodenoscopy Report Attach or Link Images: Esophagogastroduodenoscopy Images
		⊙ prompt: Esophagogastroduodenoscopy Images response: Tuple (Multiple) <b>initalValue:</b> Esophagogastroduodenoscopy
	⊙	
	⊙ ❖ Other Diagnostic Procedures	prompt: Additional Details response: String (Single)
	⊙ Medical History	
	⊙ prompt: Relevant Medical History response: String (Single) ⊙ prompt: Collect Full Detail in Patient Record response: String (Single)	
	⊙ Surgical History	
	⊙ prompt: Relevant Surgical History response: String (Single) ⊙ prompt: Collect Full Detail in Patient Record response: String (Single)	
	⊙ Medications	
	⊙ prompt: Current Medication List response: String (Single) <b>initalValue:</b> Current Medication List ⊙ prompt: Collect Full Detail in Patient Record	

	response: String (Single)
⊙ Laboratory Test Results	
	⊙ prompt: Complete Blood Count
	response: Timestamp (Single)
	⊙ prompt: Iron
	response: Timestamp (Single)
	⊙ prompt: Ferritin
	response: Timestamp (Single)
	⊙ prompt: Total Iron Binding Capacity
	response: Timestamp (Single)
	⊙ prompt: Attach or Link the Full Detail in Patient Record for each lab test result above
	response: Tuple (Multiple)
	<b>initialValue:</b> Lab test results
⊙ Plan	
	Plan, including tests, referrals, screening intervals, and screening start and discontinuation age as applicable, discussed with and agreed to by patient.
⊙ Refer for Colonoscopy	
	prompt: Screening Interval (Years)
	response: Integer (Single)
	⊙ prompt: Surveillance Start Age (Years)
	response: Integer (Single)
⊙ Stop Screening for patients aged $\geq 75$ years	
	prompt: Applicable
	response: Boolean (Single)
⊙ Gastroenterology Consult	
	prompt: Additional Details
	response: String (Single)
⊙ Other	
	prompt: Provide Description
	response: String (Single)
⊙ Plan discussed with and agreed to by the patient	
	prompt: Provide Date
	response: Timestamp (Single)
⊙ Other pertinent plan details	
	prompt: Provide Details
	response: String (Single)

---

# Chapter 15. Tabular List

## *Terminology Service Request (TSR) Mappings*

**Table 15.1. Terminology Versions**

Name	Identifier	Version
SNOMED CT	2.16.840.1.113883.6.96	United States Edition 20180301

**Table 15.2. Terminology References**

System	Code	Display Text <sup>a</sup>	References <sup>b</sup>
SNOMED CT	133936004  Adult (person)	Adult	1
SNOMED CT	163925a8-8c77-4832-8d57-00c0ff764d5d  Stool deoxyribonucleic acid testing (procedure)	Precoordinated Expression	1
SNOMED CT	241164003  Double contrast barium enema (procedure)	Precoordinated Expression	1
SNOMED CT	26604007  Complete blood count (procedure)	Precoordinated Expression	1
SNOMED CT	359979000  Total iron binding capacity measurement (procedure)	Precoordinated Expression	1
SNOMED CT	367535003  Fiberoptic colonoscopy (procedure)	Precoordinated Expression	1
SNOMED CT	398166005  Performed (qualifier value)	Precoordinated Expression	16
SNOMED CT	425666002  Computed tomography of colon (procedure)	Precoordinated Expression	1
SNOMED CT	42950004  Iron measurement (procedure)	Precoordinated Expression	1
SNOMED CT	441579003  Measurement of occult blood in stool specimen using immunoassay (procedure)	Precoordinated Expression	1
SNOMED CT	442554004  Guaiac test for occult blood in feces specimen (procedure)	Precoordinated Expression	1
SNOMED CT	453231000124104  Primary care provider (occupation)	Primary Care Provider	1
SNOMED CT	489004  Ferritin measurement (procedure)	Precoordinated Expression	1



System	Code	Display Text <sup>a</sup>	References <sup>b</sup>
SNOMED CT	73761001  Colonoscopy (procedure)	Precoordinated Expression	1
SNOMED CT	76009000  Esophagogastroduodenoscopy (procedure)	Precoordinated Expression	1
SNOMED CT	TSR-NoCode <sup>c</sup>	Precoordinated Expression	31
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a  Observation procedure (procedure)] - >(363702006  Has focus (attribute))->[21522001  Abdominal pain (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a  Observation procedure (procedure)] - >(363702006  Has focus (attribute))->[24526004  Inflammatory bowel disease (disorder)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a  Observation procedure (procedure)] - >(363702006  Has focus (attribute))->[271737000  Anemia (disorder)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a  Observation procedure (procedure)] - >(363702006  Has focus (attribute))->[33962009  Chief complaint (finding)]	Postcoordinated Expression	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a  Observation procedure (procedure)] - >(363702006  Has focus (attribute))->[363510005  Malignant tumor of large intestine (disorder)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a  Observation procedure (procedure)] - >(363702006  Has focus	Postcoordinated Expression	1

System	Code	Display Text <sup>a</sup>	References <sup>b</sup>
	(attribute))->[405729008   Hematochezia (finding)]		
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a   Observation procedure (procedure)] - >(363702006   Has focus (attribute))->[413261003   Inadequate bowel preparation (finding)]	Inadequate	3
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a   Observation procedure (procedure)] - >(363702006   Has focus (attribute))->[448765001   Unintentional weight loss (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a   Observation procedure (procedure)] - >(363702006   Has focus (attribute))->[59614000   Occult blood in stools (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a   Observation procedure (procedure)] - >(363702006   Has focus (attribute))->[703141002   Effective bowel preparation for procedure (finding)]	Adequate	3
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a   Observation procedure (procedure)] - >(363702006   Has focus (attribute))->[88111009   Altered bowel function (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a   Observation procedure (procedure)] - >(363702006   Has focus (attribute))->[b1ad8fa9-668d-4191-930f-eebdf13a914   Familial	Postcoordinated Expression	1

System	Code	Display Text <sup>a</sup>	References <sup>b</sup>
	Colorectal Cancer Type X (disorder)]		
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a  Observation procedure (procedure)]- ->(363702006  Has focus (attribute))->[107674006  Cytologic finding (finding)]- ->(116676008  Associated morphology (attribute))->[43185009  Mild dysplasia (morphologic abnormality)];	Low grade dysplasia	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a  Observation procedure (procedure)]- ->(363702006  Has focus (attribute))->[107674006  Cytologic finding (finding)]- ->(116676008  Associated morphology (attribute))->[55237006  Severe dysplasia (morphologic abnormality)];	High grade dysplasia	1
SNOMED CT	a997cc03-3e99-40e-b-833a-6374c7750a3a  Observation procedure (procedure)] ->(363702006  Has focus (attribute))->[716318002  Lynch syndrome (disorder)]	Postcoordinated Expression	1

<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.

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# Chapter 16. Behavior Symbols

**Table 16.1. Group Organizational Behavior**

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

**Table 16.2. Group Selection Behavior**

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

**Table 16.3. Required Behavior**

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

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

**Table 16.4. Precheck Behavior**

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

**Table 16.5. Cardinality Behavior**

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

**Table 16.6. Item Flags**

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

**Table 16.7. Read Only Behavior**

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

---

# Appendix A. References

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

## List of References

## Related Resources

[CCWP] *Gastroenterology: Colorectal Cancer Risk Clinical Content White Paper*

[CSD] *Gastroenterology: Colorectal Cancer Risk Documentation Template Conceptual Structure Document*

[KVRpt] *Gastroenterology: Colorectal Cancer Risk Documentation Template KNART Validation Report*

## Supporting Evidence

[Giardiello 2014] *Giardiello FM, Allen JI, Axilbund JE, et al. Guidelines on genetic evaluation and management of Lynch syndrome: a consensus statement by the US Multi-Society Task Force on colorectal cancer. Am J Gastroenterol. 2014 Aug;109(8):1159-79. (link [https://doi.org/10.1038/ajg.2014.186])*

[Johnson 2014] *Johnson DA, Barkun AN, Cohen LB, et al; US Multi-Society Task Force on Colorectal Cancer. Optimizing adequacy of bowel cleansing for colonoscopy: recommendations from the US multi-society task force on colorectal cancer. Gastroenterology. 2014;147(4):903-924. (link [https://doi.org/10.1053/j.gastro.2014.07.002])*

[Levin 2008] *Levin B, Lieberman DA, McFarland B, et al; American Cancer Society Colorectal Cancer Advisory Group; US Multi-Society Task Force; American College of Radiology Colon Cancer Committee. Screening and surveillance for the early detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology. CA Cancer J Clin. 2008;58(3):130-160. (link [https://doi.org/10.3322/CA.2007.0018])*

[Lieberman 2012] *Lieberman DA, Rex DK, Winawer SJ, Giardiello FM, Johnson DA, Levin TR. Guidelines for colonoscopy surveillance after screening and polypectomy: a consensus update by the US Multi-Society Task Force on Colorectal Cancer. Gastroenterology. 2012;143(3):844-857. (link [https://doi.org/10.1053/j.gastro.2012.06.001])*

[NCHPCP 2017a] *National Center for Health Promotion and Disease Prevention. Get Recommended Screening Tests and Immunizations for Men. National Center for Health Promotion and Disease Prevention website. https://www.prevention.va.gov/Healthy\_Living/Get\_Recommended\_Screening\_Tests\_and\_Immunizations\_for\_Men.asp. Accessed August 25, 2017. (link [https://www.prevention.va.gov/Healthy\_Living/Get\_Recommended\_Screening\_Tests\_and\_Immunizations\_for\_Men.asp])*

[NCHPDP 2017b] *National Center for Health Promotion and Disease Prevention. Get Recommended Screening Tests and Immunizations for Women. National Center for Health Promotion and Disease Prevention website. https://www.prevention.va.gov/Healthy\_Living/Get\_Recommended\_Screening\_Tests\_and\_Immunizations\_for\_Women.asp. Accessed August 25, 2017. (link [https://www.prevention.va.gov/Healthy\_Living/Get\_Recommended\_Screening\_Tests\_and\_Immunizations\_for\_Women.asp])*

[Rex 2017] *Rex DK, Boland CR, Dominitz JA, et al. Colorectal cancer screening: recommendations for physicians and patients from the U.S. Multi-Society Task Force on Colorectal Cancer. Gastroenterology. 2017;153(1):307-323. (link [https://doi.org/10.1053/j.gastro.2017.05.013])*

- [Shaukat 2013] *Shaukat A, Mongin SJ, Geisser MS, et al. Long-term mortality after screening for colorectal cancer. N Engl J Med. 2013;369(12):1106-1114. (link [https://doi.org/10.1056/NEJMoa1300720])*
- [VA 2017] *U.S. Department of Veterans Affairs. Colorectal cancer screening/surveillance (CRCS/S): reminder system. CRCS-S CR F2F 20171018 KGALPIN.pptx. PowerPoint (Jason Dominitz, MD, email communication, November 2, 2017). (link [Email Communication])*
- [USPSTF 2016] *U.S. Preventive Services Task Force. Final Recommendation Statement: Colorectal Cancer: Screening. U.S. Preventive Services Task Force website. https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/colorectal-cancer-screening2. Reviewed June 2016. (link [https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/colorectal-cancer-screening2])*