Clinical Decision Support (CDS) Content and Health Level 7 (HL7)-compliant Knowledge Artifacts (KNARTs)

Rheumatology: Rheumatoid Arthritis Clinical Content White Paper

Department of Veterans Affairs (VA)

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

Clinical Decision Support (CDS) Content and Health Level 7 (HL7)-compliant Knowledge Artifacts (KNARTs): Rheumatology: Rheumatoid Arthritis Clinical Content White Paper

by Department of Veterans Affairs (VA), , , , and

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Table 1. Relevant KNART Information to this White Paper

KNART Type	KNART ID - Name	Associated CLIN
Order Set	Rheumatoid Arthritis	CLIN0004AB
Documentation Template	Rheumatoid Arthritis	CLIN0005AB
Consult Request	Rheumatoid Arthritis	N/A

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1.1. Clinical Context Domains 1

VA Subject Matter Expert (SME) Panel

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Introduction

The VA is committed to improving the ability of clinicians to provide care for patients while increasing quality, safety, and efficiency. Recognizing the importance of standardizing clinical knowledge in support of this goal, VA is implementing the HL7 Knowledge Artifact Specification for a wide range of VA clinical use cases. Knowledge Artifacts, referred to as *KNARTs*, enable the structuring and encoding of clinical knowledge so the knowledge can be integrated with electronic health records to enable clinical decision support.

The purpose of this Clinical Content White Paper (*CCWP*) is to capture the clinical context and intent of KNART use cases in sufficient detail to provide the KNART authoring team with the clinical source material to construct the corresponding knowledge artifacts using the HL7 Knowledge Artifact Specification. This paper has been developed using material from a variety of sources: VA artifacts, clinical practice guidelines, evidence in the body of medical literature, and clinical expertise. After reviewing these sources, the material has been synthesized and harmonized under the guidance of VA subject matter experts to reflect clinical intent.

Unless otherwise noted, items within this white paper (e.g., documentation template fields, orderable items, etc.) are chosen to reflect the clinical intent at the time of creation. To provide an exhaustive list of all possible items and their variations is beyond the scope of this work.

Conventions Used

Conventions used within the knowledge artifact descriptions include:

<*obtain*> : Indicates a prompt to obtain the information listed

- If possible, the requested information should be obtained from the underlying system(s). Otherwise, prompting the user for information may be required
- The technical and clinical notes associated with a section should be consulted for specific constraints on the information (e.g., time-frame, patient interview, etc.)
- Unless otherwise noted, <obtain> indicates to obtain the most recent observation. It is recognized that this default time-frame value may be altered by future implementations

[...] : Square brackets enclose explanatory text that indicates some action on the part of the user, or general guidance to the clinical or technical teams. Examples include, but are not limited to:

[Begin ...] , *[End ...]* : Indicates the start and end of specific areas to clearly delineate them for technical purposes.

[Activate ...] : Initiates another knowledge artifact or knowledge artifact section.

[Section Prompt: ...] : If this section is applicable, then the following prompt should be displayed to the user.

[Section Selection Behavior: ...] : Indicates technical constraints or considerations for the selection of items within the section.

[Attach: ...] : Indicates that the specified item should be attached to the documentation template if available.

[Link: ...] : Indicates that rather than attaching an item, a link should be included in the documentation template.

[Clinical Comment: ...] : Indicates clinical rationale or guidance.

[Technical Note: ...] : Indicates technical considerations or notes.

[If ...] : Indicates the beginning of a conditional section.

[Else, ...] : Indicates the beginning of the alternative branch of a conditional section.

[End if ...] : Indicates the end of a conditional section.

□ *[Check boxes]* : Indicates items that should be selected based upon the section selection behavior.

Chapter 1. Rheumatoid Arthritis

Clinical Context

Rheumatoid arthritis is the most prevalent autoimmune inflammatory arthritis and is a disease that is associated with substantial disability and impacts quality of life, morbidity, and mortality. Its diagnosis and management, however, remain unclear to many primary care providers who generate the majority of referrals to rheumatologists. Exposing the basic American College of Rheumatology recommendations to primary care providers and integrating them into their workflow can decrease practice variability and increase the efficiency and appropriateness of subspecialty management ([Singh 2016]).

Table 1.1. Clinical Context Domains

Target User	Provider to include Primary Care
Patient	Adult Patients
Priority	Routine
Specialty	Primary Care
Location	Outpatient

Knowledge Artifacts

This section describes the knowledge artifacts that are intended for users caring for adult patients who present to a Primary Care Clinic with joint pain or inflammatory arthritis. The intent of these artifacts is to ensure a minimum workup is initiated prior to a Rheumatology Consultation.

Three knowledge artifacts define this clinical use case and are described in detail in the following sections. They are:

- Consult Request
  - High-level, encompassing artifact meant to communicate the request for a rheumatology consultation
  - Relies upon the documentation template and order set artifacts
- Documentation Template
  - Documents the information provided by the referring provider
  - Includes logic for appropriate display of documentation sections
- Order Set
  - Orderable items associated with the consult request
  - Includes logic for appropriate display of the order set

Chapter 2. Composite

[Begin Composite.]

Knowledge Narrative

[See Clinical Context in Chapter 1.]

Consult Request

[Technical Note: The following list provides the basic components of the consult request. This is the high-level, encompassing artifact, and must be combined with the documentation template and order set to form a fully functional knowledge artifact. The information for the consult request can be obtained as part of the composite or within the corresponding order set component in the consult section. If obtained within the composite, this information should pre-populate the respective order set component.]

[Section Prompt: In order to initiate a rheumatology consult, please provide the following information.]

- Reason for Consult: Joint Pain
- <obtain> Patient identification
- <obtain> Patient demographics
- <obtain> Information required by receiving facility
- Consult Specialty: Rheumatology
- Priority: Routine
- <obtain> Referring Physician
- <obtain> Referring Physician Contact Information

[Activate documentation template.]

[End Composite.]

Chapter 3. Documentation Template

[Begin Documentation Template.]

Knowledge Narrative

[See Clinical Context in Chapter 1.]

[Section Prompt: This documentation template is intended for primary care physicians documenting findings for outpatients with joint pain or inflammatory arthritis in preparation for their referral to rheumatology.]

History

[Begin History section.]

[Section Selection Behavior: Yes or no should be selected for each question.]

[Section Prompt: Please ask the patient the following questions:]

Is the duration of joint pain greater than 6 weeks?

- □ Yes
- □ No

Are hands or wrists involved?

- □ Yes
- □ No

Is morning stiffness present?

- □ Yes
- □ No

Did the pain have a gradual onset?

- □ Yes
- □ No

<obtain> Optional additional information

[End History section.]

Physical Exam

[Begin Physical Examination section.]

[Section Selection Behavior: Yes or no should be selected for each question.]

[Section Prompt: Please answer the following questions and provide any required additional details.]

Are there greater than four joints involved?

- □ Yes <obtain> Specific Joints Affected

- □ No

Are there signs of joint inflammation (e.g., warmth, soft tissue swelling, or tenderness)?

- □ Yes <obtain> Specific Joints Affected
- □ No

[If yes, then present the list of signs.]

[Begin list of signs.]

[Section Prompt: Check all signs that are applicable.]

[Selection Behavior: Any or none may be selected.]

- □ Warmth
- □ Soft Tissue Swelling
- □ Tenderness

[End list of signs.]

[End if Yes.]

[End Physical Exam section.]

Medication History

[Begin Medication History section.]

[Technical Note: Consider automatically including the information in this section if it is available.]

[Section Prompt: Please answer the following questions and provide any required additional details.]

[Section Selection Behavior: If Yes to a given question, then display the subcategories that follow it.]

Current or prior use of disease-modifying anti-rheumatic drugs?

- □ No
- □ Yes

  [Technical Note: If Yes then display DMARDs Section.]

  [Begin DMARDs section.]

  [Section Selection Behavior: Select at least one.]

  - □ adalimumab
  - □ etanercept
  - □ hydroxychloroquine
  - □ infliximab
  - □ leflunomide
  - □ methotrexate
  - □ rituximab

- □ sulfasalazine
- □ other <obtain> Detail

[End DMARDs.]

Was there prior use of prednisone or other glucocorticoids?

- □ Yes

[If Yes to “Was there prior use of prednisone or other glucocorticoids?” then display the subcategories of information related to the prior use.]

- <obtain> Drug name
- <obtain> Date initiated

If there are any other medication history details, please include them here:

<obtain> Patients current medications list

[End Medication History section.]

Laboratory Studies

[Begin Laboratory Studies section.]

[Technical Note: If available, the most recent results and associated dates from within the past 3 months only should be included for the following: C-reactive protein, erythrocyte sedimentation rate, hepatitis C antibody screen, complete blood count, and complete metabolic panel. If available, the most recent results and associated dates from any time should be included for the following: rheumatoid factor and anti-cyclic citrullinated peptide antibody (ACPA/Anti-CCP).]

- ACPA/Anti-CCP <obtain> Results and date
- C-Reactive Protein <obtain> Results and date
- Erythrocyte Sedimentation Rate <obtain> Results and date
- Rheumatoid Factor <obtain> Results and date
- Hepatitis C Antibody Screen <obtain> Results and date
- Complete Blood Count <obtain> Results and date
- Complete Metabolic Panel <obtain> Results and date
- Other <obtain> Test <obtain> Results <obtain> Date

[End Laboratory Studies section.]

Imaging and Diagnostic Studies

[Begin Imaging and Diagnostic Studies section.]

[Technical Note: Results text should be attached automatically if it is provided for the hand radiograph interpretation field. Include any studies performed within the past year.]

- <obtain> Hand Radiograph Interpretation

- [Link Images: Hand Radiograph]

[End Imaging and Diagnostic Studies Section.]

[End documentation template.]

Chapter 4. Order Set

[Begin Order Set.]

Knowledge Narrative

[See Clinical Context in Chapter 1.]

[Clinical Comment: This order set applies to any adult outpatients presenting to a primary care provider with joint pain or equivalent symptoms of inflammatory arthritis. All orders are routine unless otherwise specified.]

Medications

[Begin Medications section.]

[Section Prompt: No medications are required prior to a rheumatology consult. However, if prednisone is considered prior to the rheumatology consult, be aware that prednisone can potentially mask symptoms that would be evaluated by rheumatology.]

[End Medications section.]

Laboratory Studies

[Begin Laboratory Studies section.]

[Section Prompt: Consider ordering the following laboratory studies if they have not been ordered within the last three months. Note: The Anti-Nuclear Antibody (ANA) test is not considered appropriate to be ordered for suspected rheumatoid arthritis.]

[Section Selection Behavior: Optional. Any or none may be selected.]

- □ Rheumatoid Factor
- □ Anti-cyclic citrullinated peptide antibody (ACPA/Anti-CCP)
- □ Hepatitis C antibody screen
- □ Complete blood count
- □ Complete metabolic panel
- □ C-reactive protein
- □ Erythrocyte sedimentation rate

[End Laboratory Studies section.]

Imaging and Diagnostic Studies

[Begin Imaging and Diagnostic Studies section.]

[Section Prompt: Consider ordering the following imaging study if it has not been done within the past year.]

[Section Selection Behavior: Optional.]

- □ x-ray hands, bilateral, to evaluate for possible rheumatoid arthritis

[End Imaging and Diagnostic Studies section.]

[End Order Set.]

Bibliography/Evidence

[Aletaha, 2010] D Aletaha, T Neogi, and AJ Silman. “2010 Rheumatoid arthritis classification criteria: an American College of Rheumatology/European League Against Rheumatism collaborative initiative”. *Arthritis Rheum*. 2010. 62. 9. 2569-2581.

[Singh, 2016] JA Singh, KG Saag, and SL Bridges. “American College of Rheumatology. 2015 American College of Rheumatology Guideline for the Treatment of Rheumatoid Arthritis”. *Arthritis and Rheumatology (Hoboken, NJ)*. 2016. 68. 1. 1-26.

Appendix A. Existing VA Artifacts

Figure A.1. Rheumatology Provider's Note

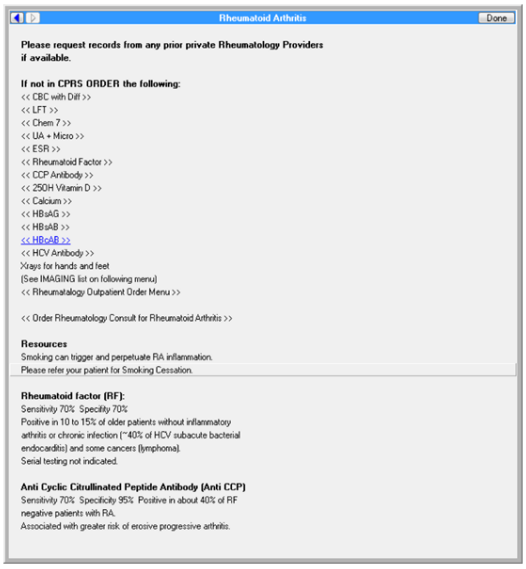


Figure A.2. Rheumatology Consult

Figure A.3. Rheumatology Outpatient

Figure A.4. Rheumatology Medications

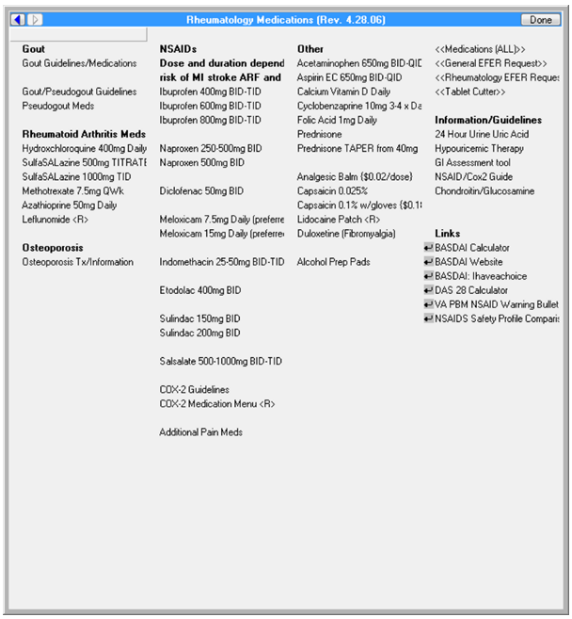
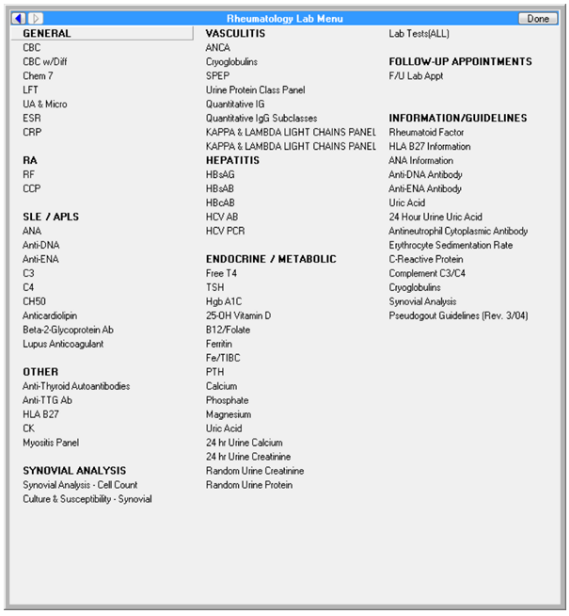


Figure A.5. Rheumatology Lab Menu



Appendix B. Acronyms

Acronym	Definition
ACPA/Anti-CCP	Anti-cyclic Citrullinated Peptide Antibody
ANA	Anti-Nuclear Antibody
CDS	Clinical Decision Support
DMARDs	Disease-Modifying Antirheumatic Drugs
HL7	Health Level 7
KBS	Knowledge Based Systems
KNART	Knowledge Artifact
NSAID	Nonsteroidal anti-inflammatory drug
OIIG	Office of Informatics and Information Governance
SLE	Systemic Lupus Erythematosus
SME	Subject Matter Expert
TO	Task Order
VA	Department of Veteran Affairs
VACO	VA Central Office
VAMC	VA Medical Center