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

Rheumatology: Rheumatoid Arthritis Clinical Content White Paper - Order Set (B14, CLIN0004AB), Consult Request Documentation Template (B38, CLIN0005AB), Composite (B59)

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

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Table of Contents

Comment [AD3]: Fix toc page numbers

List of Figures

Comment [AD4]: Fix page number references here, too.

List of Tables

VA Subject Matter Expert (SME) Panel

Name	Title	Project Role
Amy Joseph, MD	Chief of Rheumatology, St Louis VAMC; Professor of Medicine, Washington University School of Medicine	Subject Matter Expert, Primary
J. Steuart Richards, MD	Chief of Rheumatology, Pittsburgh VAMC	Subject Matter Expert, Secondary

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 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.).

  - Default values: unless otherwise noted, <obtain> indicates to obtain the most recent observation within the past 2 years. 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 …]: Indicate 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.

113
114
• [Attach: ...]: Indicates that the specified item should be attached to the documentation template if available.

115
116
• [Link: ...]: Indicates that, rather than attaching, a link to the item should be included in the documentation template.

117
• [Clinical Comments: …]: Indicates clinical rationale or guidance.

118
• [Technical Note: ...]: Indicates technical considerations or notes.

119
• [If …]: Indicates the beginning of a conditional section.

120
• [Else, …]: Indicates the beginning of the alternative branch of a conditional section.

121
• [End if …] Indicates the end of a conditional section.

122
• Check boxes: Indicates items that should be selected based upon the section selection behavior.

Rheumatoid Arthritis

1. Clinical Context

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

Clinical Context Domains

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

2. Knowledge Artifacts

This section describes the CDS KNARTs 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

  - This is a high-level, encompassing artifact meant to communicate the request for a rheumatology consultation.

  - It relies upon the documentation template and order set artifacts.

- Documentation Template

  - This is a template used to document the information provided by the referring provider.

  - It includes logic for appropriate display of documentation sections.

- Order Set

  - This is the set of orderable items associated with the consult request.

  - It includes logic for appropriate display of the order set.

Composite

150   [Begin Composite.]

1. Knowledge Narrative

152   [See Clinical Context in Chapter 1.]

2. Consult Request

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

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

160   • Reason for Consult: Joint Pain

161   • Consult Specialty: Rheumatology

162   • Priority: Routine

163   • <obtain> Referring Physician

164   • <obtain> Referring Physician Contact Information

165   [Activate Documentation Template.]

166   [End Composite.]

Documentation Template

168   [Begin Documentation Template.]

1. Knowledge Narrative

170   [See Clinical Context in Chapter 1.]

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

2. History

174   [Begin History section.]

175   [Section Selection Behavior: Select Yes or No for each question.]

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

177   Is the duration of joint pain greater than 6 weeks?

178   • ☐Yes

179   • ☐No

180   Are hands or wrists involved?

181   • ☐Yes

182   • ☐No

183   Is morning stiffness present?

184   • ☐Yes

185   • ☐No

186   Did the pain have a gradual onset?

187   • ☐Yes

188   • ☐No

189   <obtain> Optional additional information

190   [End History section.]

3. Physical Exam

192   [Begin Physical Examination section.]

193   [Section Selection Behavior: Select Yes or No for each question.]

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

195   Are more than four joints involved?

196   • ☐Yes <obtain> Specific Joints Affected

197   • ☐No

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

199   • ☐Yes <obtain> Specific Joints Affected

200   • ☐No

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

202   [Begin list of signs.]

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

204   [Selection Behavior: Select any or none. Optional.]

205   • ☐Warmth

206   • ☐Soft Tissue Swelling

207   • ☐Tenderness

208   [End list of signs.]

209   [End if Yes.]

210   [End Physical Exam section.]

4. Medication History

212   [Begin Medication History section.]

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

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

215
216   [Section Selection Behavior: Select Yes or No for each question. If Yes to a given question, then display the subcategories that follow it.]

217   Was there prior use of disease-modifying antirheumatic drugs?

218   • ☐Yes

219
220   [If Yes to "Was there prior use of disease-modifying antirheumatic drugs?" then display the subcategories of medications.]

221   • ☐ adalimumab

222   • <obtain> Date initiated

223   • <obtain> Dose

224   • ☐etanercept

225   • <obtain> Date initiated

226   • <obtain> Dose

227   • ☐hydroxychloroquine

228   • <obtain> Date initiated

229   • <obtain> Dose

230   • ☐infliximab

231 • \<obtain\> Date initiated

232 • \<obtain\> Dose

233 • ☐leflunomide

234 • \<obtain\> Date initiated

235 • \<obtain\> Dose

236 • ☐methotrexate

237 • \<obtain\> Date initiated

238 • \<obtain\> Dose

239 • ☐rituximab

240 • \<obtain\> Date initiated

241 • \<obtain\> Dose

242 • ☐sulfasalazine

243 • \<obtain\> Date initiated

244 • \<obtain\> Dose

245 • ☐other

246 • \<obtain\> Date initiated

247 • \<obtain\> Dose

248 [End if Yes.]

249 • ☐ No

250 Was there prior use of prednisone or other glucocorticoids?

251 • ☐Yes

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

254 • \<obtain\> Drug name

255 • \<obtain\> Date initiated

256 • \<obtain\> Date ended

257 [End if Yes.]

258 • ☐ No

259 [End Medication History section.]

5. Laboratory Studies

261 [Begin Laboratory Studies section.]

262 [Technical Note: If available, the most recent results and dates within the past 3 months should be included for
263 the following: C-reactive protein, erythrocyte sedimentation rate, hepatitis C antibody screen, complete blood

264 count, and complete metabolic panel. If available, the most recent results and dates from any time should be
265 included for the following: rheumatoid factor and anti-cyclic citrullinated peptide antibody (ACPA/Anti-CCP).]

266 • Anti-cyclic Citrullinated Peptide Antibody (ACPA/Anti-CCP) <obtain> Results and date

267 • C-Reactive Protein <obtain> Results and date

268 • Erythrocyte Sedimentation Rate <obtain> Results and date

269 • Rheumatoid Factor <obtain> Results and date

270 • Hepatitis C Antibody Screen <obtain> Results and date

271 • Complete Blood Count <obtain> Results and date

272 • Complete Metabolic Panel <obtain> Results and date

273 • Other <obtain> Test <obtain> Results <obtain> Date

274 [End Laboratory Studies section.]

275 6. Imaging and Diagnostic Studies

276 [Begin Imaging and Diagnostic Studies section.]

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

279 • <obtain> Hand Radiograph Interpretation

280 • [Link Images: Hand Radiograph]

281 [End Imaging and Diagnostic Studies section.]

282 [End Documentation Template.]

Order Set

₂₈₃

₂₈₄ [Begin Order Set.]

1. Knowledge Narrative

₂₈₅

₂₈₆ [See Clinical Context in 1.]

₂₈₇ [Clinical Comment: This order set applies to any adult outpatients presenting to a primary care provider with
₂₈₈ joint pain or equivalent symptoms of inflammatory arthritis. All orders are routine unless otherwise specified.]

2. Medications

₂₈₉

₂₉₀ [Begin Medications section.]

₂₉₁ ~~[Clinical Note: No medications are required prior to a rheumatology consult. However, if a user attempts to~~
₂₉₂ ~~order prednisone prior to the rheumatology consult, the user should be cautioned that prednisone can mask~~
₂₉₃ ~~symptoms and should not be ordered prior to evaluation by rheumatology.]~~

₂₉₄ [Section Prompt: No medications are required prior to a rheumatology consult. However, if prednisone is
₂₉₅ considered prior to the rheumatology consult, be aware that prednisone can potentially mask symptoms that
₂₉₆ would be evaluated by rheumatology.]

₂₉₇ [End Medications section.]

3. Laboratory Studies

₂₉₈

₂₉₉ [Begin Laboratory Studies section.]

₃₀₀ [Section Prompt: Consider ordering the following laboratory studies if they have not been ordered within the
₃₀₁ last three months. Note: The ANA test is not considered appropriate to be ordered for suspected rheumatoid
₃₀₂ arthritis.]

₃₀₃ [Section Selection Behavior: Select any or none. Optional.]

₃₀₄ • ☐ Rheumatoid factor

₃₀₅ • ☐ Anti-cyclic citrullinated peptide antibody (ACPA/Anti-CCP)

₃₀₆ • ☐ Hepatitis C antibody screen

₃₀₇ • ☐ Complete blood count

₃₀₈ • ☐ Complete metabolic panel

₃₀₉ • ☐ C-reactive protein

₃₁₀ • ☐ Erythrocyte sedimentation rate

₃₁₁ [End Laboratory Studies section.]

4. Imaging and Diagnostic Services

₃₁₂

₃₁₃ [Begin Imaging and Diagnostic Studies section.]

₃₁₄ [Section Prompt: Consider ordering the following imaging study if it has not been done within the past year.]

₃₁₅ [Section Selection Behavior: Optional.]

Comment [WL5]: I am trying to understand the workflow for this. How does the system know that we are in the timeframe "prior to rheumatology consult"? This would be nice but does just opening this order set enable the functionality? If not, then perhaps some kind of guidance presented to the user here would be helpful.

Team B3 10/11/17: Clarified the clinical intent and changed from a clinical comment to an actual prompt to warn ordering providers that prednisone can mask symptoms.

Comment [CS6]: Linda, I agree that it is not clear when and how this order set would be activated. I wonder if the documentation template or the consult request should specify a link to the order set. This is a general issue that should be handled the same across the various KNARTS

316 • ☐x-ray hands, bilateral, to evaluate for possible rheumatoid arthritis

317 [End Imaging and Diagnostic Studies section.]

318 [End Order Set.]

Bibliography/Evidence

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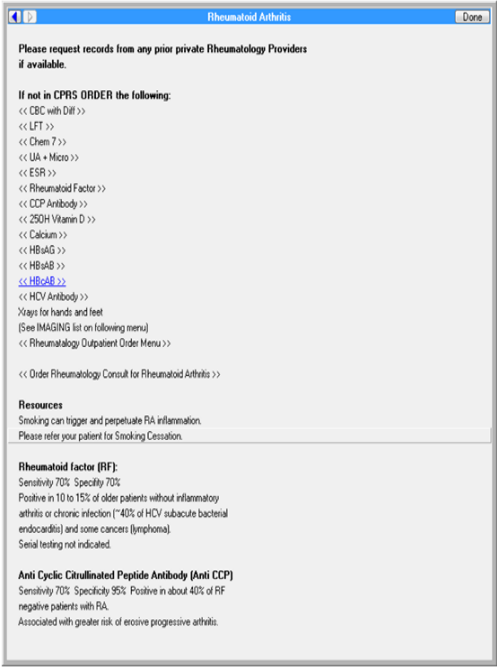322 *Arthritis Rheum*. 2010. 62. (9). 2569-2581.

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

Appendix A: Existing VA Artifacts

326

327 **Figure A.1. Figure 1**

328

329   **Figure A.2. Figure 2**

330

331 **Figure A.3. Figure 3**
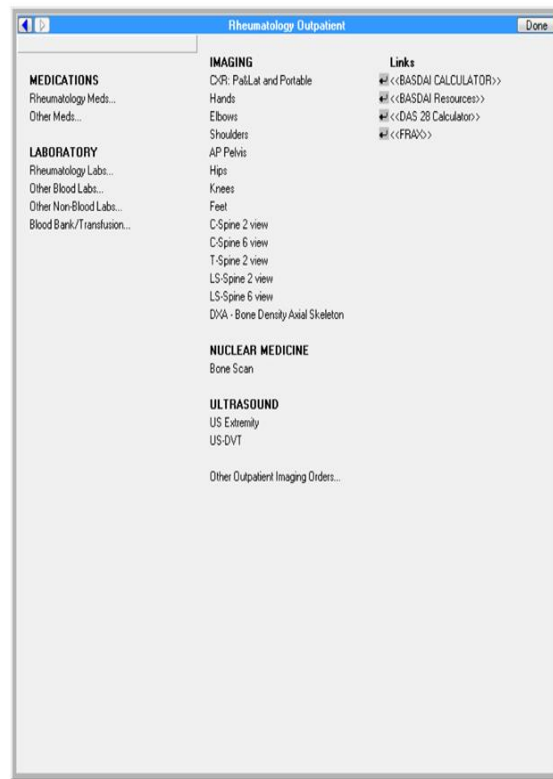
332

333 **Figure A.4. Figure 4**

334
335

336   **Figure A.5. Figure 5**

337

338

339