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

Neurosurgery: Radiculopathy (Cervical) 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): Neurosurgery: Radiculopathy (Cervical) Clinical Content White Paper

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

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

Table 1. Relevant KNART Information

KNART Name	Associated CLIN
Radiculopathy (Cervical) - Order Set	CLIN0004AB
Radiculopathy (Cervical) - Documentation Template	CLIN0005AC
Radiculopathy (Cervical) - Composite/Consult Request	N/A

Table of Contents

List of Figures

List of Tables

VA Subject Matter Expert (SME) Panel

Name	Title	Project Role
David (Cory) Adamson, MD	Physician, 1670 Clairmont Rd, Atlanta, GA 30033	SME, Primary
Jacob Rachlin, MD	Chief of Neurosurgery, VA Boston Health Care System, 1400 VFW Parkway, Boston, MA 02132	SME, Secondary
Joseph King, MD	Physician, Surgical Service, VA New England/Connecticut Healthcare System, 950 Campbell Ave, West Haven, CT 06516	SME

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 for this use case.

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 one 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 the specified item should be attached to the documentation template if available.

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

  - [Clinical Comments: ...]: 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.

  - [Else if...] Indicates the end of a conditional section.

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

Chapter 1. Radiculopathy (Cervical)

Clinical Context

The Neurosurgery Radiculopathy (Cervical) KNART set is intended for referring providers (Primary Care, Pain Clinic, Anesthesiologist, Physical Therapist and sometimes Emergency Department Physicians) performing an initial workup for adult outpatients with symptoms prior to requesting a Neurosurgery Consultation. Diagnostic and treatment modalities include Magnetic Resonance Imaging (MRI), Computed Tomography (CT) Myelogram, medication, physical therapy, acupuncture, steroid injections and pain clinic visits. The provider should also consider both a mental health evaluation and a substance abuse evaluation (alcohol, smoking, opioids/narcotics) where appropriate. The clinical context for this consultation includes only routine, non-urgent referrals to neurosurgery. Spinal surgery is performed by orthopedic surgeons as well, but since orthopedic surgery was not involved in development of this knowledge artifact it should be reviewed by orthopedic surgery before it is used in the context of consults to orthopedic surgery.

Table 1.1. Clinical Context Domains

Target User	Provider in Primary Care, Emergency Medicine, Anesthesiology, Pain Clinic, Physical Therapy
Patient	Adult outpatient being referred to Neurosurgery for Radiculopathy (Cervical)
Priority	Routine/Non-urgent
Specialty	Primary Care
Location	Outpatient

Knowledge Artifacts

This section describes the CDS knowledge artifacts that are specific to Neurosurgery Radiculopathy (Cervical) and is intended for users caring for adult patients who may require a Neurosurgery referral for surgery. Target clinical users include Primary Care physicians, Emergency Department physicians, Physical Therapist, Pain Clinic or Anesthesiologists. Patient cohort includes adult outpatients being referred to Neurosurgery.

The intent of these artifacts is to ensure a minimum workup is initiated prior to a Neurosurgery Consultation. Specific constraints for these artifacts are that:

• They apply to adult outpatients being considered for Neurosurgery referral.

• All imaging studies and treatment modalities are documented and appropriate results are accessible for Neurosurgery consultation.

There are three knowledge artifacts that define this clinical use case. These artifacts are the Consult Request, the Documentation Template and the Order Set and are described in detail in the following sections.

• Consult Request

  • This is a high-level, encompassing artifact.

  • 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.

Chapter 2. Composite

[Begin Composite.]

Knowledge Narrative

[See Clinical Context in Chapter 1.]

Cervical radiculopathy is a common problem that exerts a significant impact on functional impairment, chronic pain, disability, absenteeism, and other parameters that negatively affect quality of life. Referring physicians, most commonly primary care physicians and mid-level providers, often respond to the frustration of a patient with cervical radiculopathy by ordering advanced imaging tests and prematurely referring patients to subspecialists before exhausting the full array of conservative treatment modalities that are within their scope of practice. Implementation of an evidence-based approach consistent with the recommendations of authoritative professional societies, such as the American Association of Neurological Surgeons and the Congress of Neurological Surgeons, can optimize resource allocation and facilitate use of appropriate treatment modalities based on clinical presentation.

Consult and Referrals

[Begin Consult and Referrals.]

[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: To request a neurosurgery consult for evaluation of cervical radiculopathy, please provide the following information.]

• Reason for Consult: Evaluate patient with cervical radiculopathy for surgery

• Consult Specialty: Neurosurgery

• Priority: Routine

• <obtain> Referring Physician

• <obtain> Referring Physician Contact Information

[Activate Documentation Template.]

[End Consult and Referrals.]

[End Composite.]

Chapter 3. Documentation Template

[Begin Documentation Template.]

Knowledge Narrative

[See Clinical Context in Chapter 1.]

[Section Prompt: This documentation template should be completed by the provider requesting neurosurgical evaluation for a patient with cervical radiculopathy.]

Chief Complaint

[Begin Chief Complaint section.]

[Section Prompt: Chief Complaint.]

[Section Selection Behavior: Select at least one.]

- ☐ Pain

- ☐ Numbness

- ☐ Weakness

- ☐ Other <obtain>

[Section Prompt: Location of symptoms.]

[Section Selection Behavior: Select at least one.]

- ☐ Neck

- ☐ Left Arm

- ☐ Right Arm

- ☐ Other <obtain> Location

[Section Prompt: If pain is not a chief complaint, then skip to Duration of Symptoms.]

[Section Prompt: Please provide details regarding the character of the pain]

- ☐ Burning

- ☐ Shooting/Electric

- ☐ Aching

<obtain> Details

[Section Prompt: Duration of Symptoms?]

[Section Selection Behavior: Select only one.]

- ☐ Acute (Less than 2 weeks)

- ☐ Subacute (Greater than or equal to 2 weeks and less than or equal to 3 months)

- ☐ Chronic (Greater than 3 months)

[End Chief Complaint section.]

Prior Conservative Therapies

[Begin Prior Conservative Therapies section.]

[Section Prompt: Which conservative therapies have been tried?]

Medications.   [Subsection Prompt: Medications.]

[Section Selection Behavior: Select any. Optional.]

[Technical Note: Details for this subsection include: name of medication, dose, date started, and date ended.]

- ☐ Nonsteroidal anti-inflammatory drug (NSAIDs) <obtain> Details

- ☐ Opioids <obtain> Details

- ☐ Antiepileptics <obtain> Details

- ☐ Tricyclic antidepressants <obtain> Details

- ☐ Muscle relaxants <obtain> Details

- ☐ Other <obtain> Details

- ☐ None

Other Therapies.   [Subsection Prompt: Other Therapies.]

[Section Selection Behavior: Select any. Optional.]

[Technical Note: Details for this subsection include: therapy summary, date started, date ended, number of times and outcome.]

- ☐ Occupational Therapy <obtain> Details

- ☐ Cervical traction <obtain> Details

- ☐ Acupuncture <obtain> Details

- ☐ Spinal Manipulation <obtain> Details

- ☐ Cognitive behavioral therapy <obtain> Details

- ☐ Pain clinic <obtain> Details

- ☐ Selective nerve root blocks <obtain> Details

- ☐ Epidural steroid injections <obtain> Details

- ☐ Other <obtain> Details

[End Prior Conservative Therapies section.]

Medical History

[Begin Medical History section.]

[Section Prompt: Applicable Medical History.]

[Section Selection Behavior: Select any. Optional.]

[Technical Note: Details for this section include: summary, consult date, consult results, current status.]

- ☐ Other chronic pain <obtain> Details

- ☐ Posttraumatic stress disorder <obtain> Details

- ☐ Anxiety <obtain> Details

- ☐ Depression <obtain> Details

- ☐ Other mental conditions <obtain> Details

- ☐ Oncological conditions <obtain> Details

- ☐ Obesity <obtain> Body Mass Index (BMI)

- ☐ Cardiovascular conditions <obtain> Details

- ☐ Other relevant medical history <obtain> Details

[Technical Note: Provide link to full medical history.]

[End Medical History section.]

Surgical History

[Begin Surgical History section.]

[Section Prompt: Applicable Surgical History.]

[Section Selection Behavior: Select any. Optional.]

[Technical Note: Details for this section include: surgical summary and surgery date.]

- ☐ Spinal surgery <obtain> Details

- ☐ Other prior surgeries <obtain> Details

[Technical Note: Provide link to full surgical history.]

[End Surgical History section.]

Social History

[Begin Social History section]

[Section Prompt: Social History.]

[Section Selection Behavior: Select any. Optional.]

[Technical Note: Details for this section include: summary, current status, applicable dates.]

- ☐ Alcohol use/abuse <obtain> Details

- ☐ Rehabilitation or detoxification <obtain> Details

- ☐ Current or former tobacco user <obtain> Details <obtain> Pack years

- [Technical Note: Provide link to Tobacco Assessment and Cessation Counseling KNART.]

- ☐ Cocaine use/abuse <obtain> Details

- ☐ Other substance use/abuse <obtain> Details

- ☐ Homeless <obtain> Details

- [Technical Note: Provide link to Homelessness Documentation Template KNART.]

- ☐ Unstable home environment <obtain> Details

- ☐ Home environment conducive to healing <obtain> Details

- ☐ Geographically remote (40+mile drive to medical care) <obtain> Details

[End Social History section.]

Imaging History

[Begin Imaging History section.]

[Section Prompt: Imaging History.]

[Section Prompt: The most recent imaging studies in each category should be included.]

[Technical Note: Result text should be attached automatically if available for the Cervical Spine X-Ray Interpretation field.]

- <obtain> Cervical Spine X-rays Interpretation with dynamic flexion and extension

- [Link Images: Cervical Spine X-Rays.]

[Technical Note: Result text should be attached automatically if available for the Cervical Spine MRI Interpretation field.]

- <obtain> Cervical Spine MRI Interpretation

- [Link Images: Cervical Spine MRI.]

[Technical Note: Result text should be attached automatically if available for the Cervical Spine Myelogram Interpretation field.]

- <obtain> Cervical Spine Myelogram Interpretation

- [Link Images: Cervical Spine Myelogram.]

[Technical Note: Result text should be attached automatically if available for the Cervical Spine CT Interpretation field.]

- <obtain> Cervical Spine CT Interpretation

- [Link Images: Cervical Spine CT.]

[End Imaging History section.]

Medications

[Begin Medications List section.]

<obtain> Current pain medication list

<obtain> Current anticoagulation and antiplatelet list

[End Medications List section.]

Surgical Candidacy

[Begin Surgical Candidacy section.]

[Section Prompt: Does patient want to be considered for surgery?

- ☐ Yes

- ☐ No <obtain> reason for neurosurgical consult

[End Surgical Candidacy section.]

[End Documentation Template.]

Chapter 4. Order Set

[Begin Order Set.]

Knowledge Narrative

[See Clinical Context in Chapter 1.]

Medications

[Begin Medications section]

[Section Prompt: Based upon clinical judgment and if not otherwise contraindicated, consider initiating a new order for one or more of the following medications prior to the neurosurgery consultation.]

[Section Prompt: NSAIDs.]

[Section Prompt: NSAIDs increase the risk of serious gastrointestinal adverse events including bleeding, ulceration, and perforation of the stomach or intestines, which can be fatal. The prevailing recommendations in consensus-based clinical guidelines recommend that NSAID/Cyclo-oxygenase-2 (COX-2) should be avoided in Chronic Kidney Disease (CKD).]

[Technical Note: Provide link to https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3417055/#R6/link]

[Section Selection Behavior: Select only one. Optional.]

- ☐ Ibuprofen 400 mg tablet oral every 6 hours as needed for neck or arm pain; may increase dose frequency to one tablet every 4 hours 100 tablets 2 refills

- ☐ Naproxen sodium 550 mg tablet oral every 12 hours as needed for neck or arm pain 100 tablets 2 refills

[Section Prompt: Other Analgesics.]

[Section Selection Behavior: Select only one. Optional.]

- ☐ Acetaminophen 325 mg tablet oral two tablets every 6 hours as needed for neck or arm pain; may increase dose frequency to two tablets every 4 hours; do not take more than 10 tablets per day 100 tablets 2 refills

[Section Prompt: Glucocorticoids, Oral (For acute pain only)]

[Section Selection Behavior: Select only one. Optional.]

- ☐ Methylprednisolone 4 mg tablet oral by taper:

  - take 6 tablets at once on day 1

  - On day 2 take one tablet before breakfast, one after lunch, one after dinner, and two at bedtime

  - On day 3 take one tablet before breakfast, one after lunch, one after dinner, and one at bedtime

  - On day 4 take one tablet before breakfast, one after lunch, and one at bedtime

  - On day 5 take one tablet before breakfast and one at bedtime

  - On day 6 take one tablet before breakfast.

  - 21 tablets 0 refills

[End Medications section.]

[Section Prompt: Other Medications]

[Technical Note: Provide a link to institutional pharmacy orders]

Procedures

[Begin Procedures section.]

[Section Prompt: Consider ordering the following procedures in conjunction with the neurosurgery consult. Typically for pain management, unless contraindicated for any reason, one would order glucocorticoid injection from the list below first, and if indicated, proceed to selective nerve block based on clinical outcome of patient's symptoms following completion of the series of 3 glucocorticoid injections.]

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

- ☐ Epidural glucocorticoid injection under fluoroscopic or CT guidance per interventionist (series of three)

- ☐ Selective nerve root block per interventionist to distinguish symptomatic level(s) following identification of compressive lesions at multiple levels on MRI or CT myelography

- ☐ Selective nerve root block per interventionist to distinguish symptomatic level(s) in patient with discordance between clinical symptoms and findings on MRI or CT myelography

[End Procedures section.]

Imaging

[Begin Imaging section]

[Section Prompt: Consider ordering one of the following imaging studies in conjunction with the neurosurgery consult.]

[Section Selection Behavior: Select only one. Optional.]

- ☐ X-ray cervical spine anteroposterior (AP) and lateral for neck pain, flexion and extension views

- ☐ MRI cervical spine without intravenous (IV) contrast (consider for: chronic neck pain, failed conservative management, candidate for surgical intervention)

- ☐ CT cervical spine without IV contrast (consider for: chronic neck pain, failed conservative management, candidate for surgical intervention, MRI contraindicated, IV contrast contraindicated)

- ☐ CT myelography cervical spine (consider for: chronic neck pain, failed conservative management, candidate for surgical intervention, MRI contraindicated)

- ☐ CT myelography cervical spine (consider for: chronic neck pain, failed conservative management, candidate for surgical intervention, clinical findings discordant with MRI findings)

[End Imaging Section.]

Additional Consults

[Begin Additional Consults section.]

[Section Prompt: Consider ordering the following consults in conjunction with the neurosurgery consult.]

[Section Selection Behavior: Optional. Select as many as desired.]

- ☐ Consult physical therapy to evaluate for conservative therapy for cervical radiculopathy (e.g., cervical halter traction, electrical stimulation, acupuncture, exercise instruction)

- ☐ Consult psychiatry to evaluate for depression and other psychological factors that may affect patient's perception of pain and ability to manage pain

- ☐ Consult social services to evaluate social factors (e.g., joblessness, homelessness, financial concerns) that may affect patient's ability to adhere to conservative treatment

- ☐ Consult pain management to address modalities for treating chronic pain

- ☐ Consult chiropractor for spinal manipulation

- ☐ Consult acupuncture

[End Additional Consults section.]

Patient Education

[Begin Patient Education section.]

[Section Prompt: Consider ordering patient education in conjunction with the neurosurgery consult.]

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

- ☐ Cervical radiculopathy education (level-appropriate materials on natural progression, conservative management, and procedural management)

[End Patient Education section.]

[End Order Set.]

Bibliography/Evidence

[Bono, 2011] CM Bono, G Ghiselli, and TJ Gilbert. "An evidence-based clinical guideline for the diagnosis and treatment of cervical radiculopathy from degenerative disorders". *Spine J*. 2011. 11. 1. 64-72.

Joint Section on Disorders of the Spine and Peripheral Nerves of the American Association of Neurological Surgeons and Congress of Neurological Surgeons. *Guidelines for the surgical management of cervical degenerative disease*. J Neurosurg Spine. 2009. 11. 2. 97-252.

[Kuijper, 2009] B Kuijper, JTJ Tans, A Beelen, F Nollet, and M de Visser. "Cervical collar or physiotherapy versus wait and see policy for recent onset cervical radiculopathy: randomised trial". *BMJ*. 2009. 11. 339-b3883.

[Newman, 2013] JS Newman, BN Weissman, PD Angevine, and et al. "Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria: Chronic Neck Pain". *American College of Radiology Website*. 2013. https://acsearch.acr.org/docs/69426/Narrative/.

U.S. National Library of Medicine. *IBU- ibuprofen tablet [Dr. Reddy's Laboratories Limited]*. DailyMed website. Revised October 2016. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=24731405-219c-79b4-ecf0-7d5fbfda94ba.

U.S. National Library of Medicine. *MEDROL- methylprednisolone tablet [Pharmacia and Upjohn Company LLC]*. DailyMed website. Revised November 2016. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=39d5270b-d957-4821-93d6-501b7b9f02d4.

U.S. National Library of Medicine.. *NAPROSYN- naproxen tablet; EC-NAPROSYN- naproxen tablet, delayed release; NAPROSYN- naproxen suspension; ANAPROX- naproxen sodium tablet; ANAPROX DS- naproxen sodium tablet [Genentech, Inc.]*. DailyMed website. Revised March 2016. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=68848217-03c9-4377-9be6-6f567e629129.

U.S. National Library of Medicine. *Tylenol Regular Strength-acetaminophen tablet[Johnson &Johnson Consumer Inc.,McNeil Consumer Healthcare Division]*. DailyMed website. Revised March 2016. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=68848217-03c9-4377-9be6-6f567e629129.

Appendix A. Appendix: Existing VA Artifacts

Figure A.1. Neurosurgery Consult

Figure A.2. Neurosurgery Spine Consults

Figure A.3. Cervical/Thoracic Radiculopathy

Figure A.4. MRI Orders

Figure A.5. Myelogram Consult

Figure A.6. Service Prerequisites for Imaging Myelogram Consult

Figure A.7. Reason For Request Myelogram

Figure A.8. Reason for Request Imaging Myelogram Consult

Figure A.9. Reason for Request Short Stay Unit

Figure A.10. Order Consult Myelogram

Figure A.11. Short Stay Orders


```
Reason for Request: Short Stay Care Unit                                    □ ▣ ✕

Consult requested: SSCU - Post Myelogram

Admit patient to SSCU:
   Requested date: |                    [...]    Service:                      [▾]

1) Injection time was at:                       [...]

2) Record VS in CPRS and on SSCU flow sheet upon arrival to unit.

3) Monitor VS every 15 minutes X 2, then every hour X 2 and at discharge.

4) Diet:
   ○ Clear liquids
   ○ Nothing per mouth
   ○ No diet restrictions
   ○ Regular diet, force fluids
   ○ As tolerated
   ○ Other -

5) Activity: *
   □ No restrictions
   □ Bedrest
   □ Bedrest with bathroom privileges
   □ Elevate HOB 30 degrees or more

6) Call MD for persistent Nausea and Vomiting.

7) Discharge home after 3.5 hours post injection. VS @ baseline and
   discharge criteria is met per SSCU Operating policy.

8) Review and send written Discharge instructions with patient. Encourage
   slow movements for 24 hours.

Please enter any additional comments or information below:



          * Indicates a Required Field     [ Preview ]     [ OK ]     [ Cancel ]
```

Figure A.12. Short Stay Care Unit Consult

Figure A.13. Service Prerequisite Questions

Figure A.14. Cervical/Thoracic Myelogram, Urgency Criteria and Required Tests

Figure A.15. The Neurosurgery Service Prerequisites Cervical/Thoracic Myelopathy Outpatient

Figure A.16. Neurosurgery Consult Cervical/Thoracic Myelopathy

Figure A.17. Neurosurgery Consult Goals for Cervical/Thoracic Myelopathy

Figure A.18. Neurosurgery Consult Order

Figure A.19. Neurosurgery Consult Request, Pre-requisite Tests not Completed

Figure A.20. Neurosurgery Consult Request

Figure A.21. Neurosurgery Consult Request

Figure A.22. Neurosurgery Consult Request


```
Template: NEUROSURGERY CERVICAL SPINE OUTPT - WLA

RATED DISABILITIES - NONE FOUND
-
*******************************************************************
NEUROSURGERY CERVICAL DISEASE
For urgent request, please page the service:  Pager info link

If clinically appropriate, this consult may be responded to using chart
review (E-Consult).

***Please note:  Your consult WILL BE DENIED if this patient does not have relevant imaging within 1 year of
your consult request. All outside images MUST be uploaded into our Vista Imaging/IMPAX system before
submitting your request. This helps us screen patients and determine whether or not they would benefit from
surgical intervention ***
○ Cervical Stenosis
◉ Cervical Disc Disease
    ○ <====CLICK HERE TO CONTINUE
      ALL are generally required to warrant neurosurgery:
      1. Has an MRI without contrast (or a CT myelogram if contraindicated)
         been completed within 1 year of this consult request? *○ Yes ○ No
      2. Has this patient had an epidural steroid injection? *○ Yes ○ No
         - If yes, please provide the date:       ▽        ✦
          - If no, please consult interventional pain management prior to
             consulting neurosurgery (consults/procedure order menu-->WLA consults
             -->pain consults WLA-->interventional pain clinic)
            (The majority of herniated discs do NOT require surgery and can improve
            significantly with an epidural steroid injection).
      3. Patient agrees to surgical intervention, if appropriate. *○ Yes ○ No
        - If no, please do not refer this patient to our clinic
           (consult PM&RS instead for conservative management)
      4. Does the patient have radiculopathy in a specific dermatomal
         distribution? *○ Yes ○ No

      Additional history and rationale for request:
      *

  [ All ]  [ None ]   * Indicates a Required Field   [ Preview ]   [ OK ]   [ Cancel ]
```
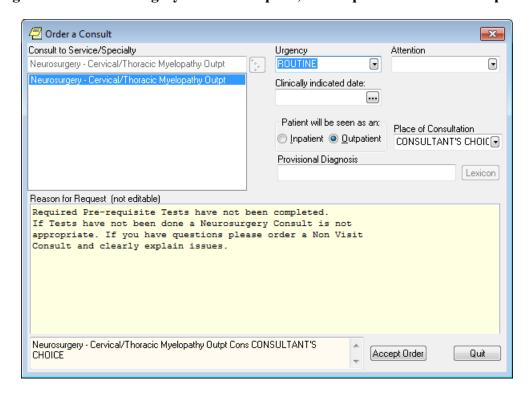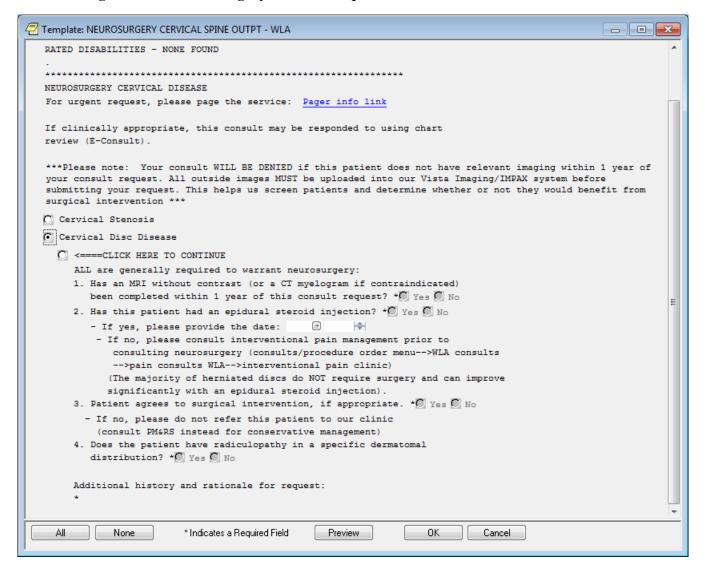
Figure A.23. Service Prerequisites for Myelogram Consult

Appendix B. Acronyms

Acronym	Definition
AP	Anteroposterior
BMI	Body Mass Index
CDS	Clinical Decision Support
CKD	Chronic Kidney Disease
COX-2	Cyclo-oxygenase-2
CT	Computed Tomography
HL7	Health Level 7
IV	Intravenous
KBS	Knowledge Based Systems
KNART	Knowledge Artifact
MRI	Magnetic Resonance Imaging
NSAID	Nonsteroidal anti-inflammatory drug
OIIG	Office of Informatics and Information Governance
SME	Subject Matter Expert
TO	Task Order
VA	Department of Veterans Affairs