Neurosurgery: Radiculopathy (Lumbar Thoracic) Order Set

Order Set: Conceptual Structure

Contract: VA118-16-D-1008, Task Order (TO): VA-118-16-F-1008-0007, CLIN0004AE

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Neurosurgery: Radiculopathy (Lumbar Thoracic) Order Set: Order Set: Conceptual Structure

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

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Preface

Table 1. Revision History

Date	Life Cycle Event
June 20, 2018	Published
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Table 2. Clinical White Paper Contributors

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Table 3. Artifact Identifier

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	71695ccb-cc42-5c04-82ae-7685caae0a97	B16

Artifact Applicability

Table 4. Applicability Foci, Description and Codes

Focus	Description	Code System	Code	Value Set	Value Set Version
PatientAgeGroup	Adult			N/A	N/A
ClinicalVenue	Outpatient			N/A	N/A
ClinicalFocus	Adult outpatient being referred to Neurosurgery for Radiculopathy (Lumbar/Thoracic).			N/A	N/A
TargetUser	Provider in Primary Care, Emergency Medicine, Anesthesiology, Pain Clinic, Physical Therapy			N/A	N/A
WorkflowTask	Referral to Neurosurgery for Radiculopathy (Lumbar/Thoracic).			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

No externalData expression definitions and no trigger definitions are present.

Chapter 2. Expression Definitions

No expression definitions are present.

Chapter 3. Medications

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.

NSAIDs

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).

✪ Ibuprofen 400 mg tablet oral every 6 hours as needed for back pain; may increase dose frequency to one tablet every 4 hours 100 tablets 2 refills

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

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

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 | Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;197805 Ibuprofen 400 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]

purpose[0]: Postcoordinated Expression [277132007 | Therapeutic procedure (procedure)] ->(363702006 |Has focus (attribute))->[161891005 |Backache (finding)]

unstructured[0]: 100 tablets 2 refills

requestedResult.lowerBound: 1

requestedResult.upperBound: 1

requestedResult.includeLowerBound: true

requestedResult.includeUpperBound: true

requestedResult.measureSemantic: Precoordinated Expression 421026006 |Oral tablet (qualifier value)|

repetition[0].periodDuration.lowerBound: 1

repetition[0].periodDuration.upperBound: 50

repetition[0].periodDuration.resolution: 1

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

repetition[0].eventFrequency.lowerBound: 4

repetition[0].eventFrequency.upperBound: 6

repetition[0].eventFrequency.includeLowerBound: true

repetition[0].eventFrequency.includeUpperBound: true

repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258702006 |hour (qualifier value)|

✪ Naproxen 550mg tablet oral every 12 hours as needed for back pain 100 tablets 2 refills

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

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

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 | Direct substance (attribute))->[Rx;849431 Naproxen sodium 550 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]

purpose[0]: Postcoordinated Expression [277132007 | Therapeutic procedure (procedure)] ->(363702006 |Has focus (attribute))->[161891005 |Backache (finding)]

unstructured[0]: 100 tablets 2 refills

requestedResult.lowerBound: 1

requestedResult.upperBound: 1

requestedResult.includeLowerBound: true

requestedResult.includeUpperBound: true

requestedResult.measureSemantic: Precoordinated Expression 421026006 |Oral tablet (qualifier value)|

repetition[0].periodDuration.lowerBound: 1

repetition[0].periodDuration.upperBound: 150

repetition[0].periodDuration.resolution: 1

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

repetition[0].eventFrequency.lowerBound: 4

repetition[0].eventFrequency.upperBound: 6

repetition[0].eventFrequency.includeLowerBound: true

repetition[0].eventFrequency.includeUpperBound: true

repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258702006 |hour (qualifier value)|

Other Analgesics

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

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

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

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 | Direct substance (attribute))->[Rx;313782 Acetaminophen 325 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]

purpose[0]: Postcoordinated Expression [277132007 | Therapeutic procedure (procedure)] ->(363702006 |Has focus (attribute))->[161891005 |Backache (finding)]

unstructured[0]: Do not take more than 10 tablets per day

unstructured[1]: 100 tablets 2 refills

requestedResult.lowerBound: 2

requestedResult.upperBound: 2

requestedResult.includeLowerBound: true

requestedResult.includeUpperBound: true

requestedResult.measureSemantic: Precoordinated Expression 421026006 |Oral tablet (qualifier value)|

repetition[0].periodDuration.lowerBound: 1

repetition[0].periodDuration.upperBound: 50

repetition[0].periodDuration.resolution: 1

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

repetition[0].eventFrequency.lowerBound: 4

repetition[0].eventFrequency.upperBound: 6

repetition[0].eventFrequency.includeLowerBound: true

repetition[0].eventFrequency.includeUpperBound: true

repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258702006 |hour (qualifier value)|

Other Analgesics

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; and on day 6 take one tablet before breakfast. 21 tablets 0 refills

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

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

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 | Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;259966 methylPREDNISolone 4 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]

purpose[0]: Postcoordinated Expression [277132007 | Therapeutic procedure (procedure)] ->(363702006 |Has focus (attribute))->[161891005 |Backache (finding)]

unstructured[0]: 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; and on day 6 take one tablet before breakfast

unstructured[1]: 21 tablets 0 refills

repetition[0].periodDuration.lowerBound: 6

repetition[0].periodDuration.upperBound: 6

repetition[0].periodDuration.resolution: 1

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

repetition[0].eventFrequency.lowerBound: 4

repetition[0].eventFrequency.upperBound: 6

repetition[0].eventFrequency.includeLowerBound: true

repetition[0].eventFrequency.includeUpperBound: true

repetition[0].eventFrequency.measureSemantic: Precoordinated Expression 258702006 |hour (qualifier value)|

Chapter 4. Procedures

Consider ordering the following procedures in conjunction with the neurosurgery consult.

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

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

> statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|
>
> topic: Postcoordinated Expression [432406007 |Epidural injection using computed tomography guidance (procedure)] ->(260686004 |Method (attribute))->[129326001 |Injection - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[116596006 |Glucocorticoid preparation (product)|
>
> unstructured[0]: per interventionist
>
> requestedResult.lowerBound: 3
>
> requestedResult.upperBound: 3
>
> requestedResult.includeLowerBound: true
>
> requestedResult.includeUpperBound: true
>
> requestedResult.measureSemantic: Precoordinated Expression 385218009 |Injection (qualifier value)|

Lumbar support brace for subacute lower back pain

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

> statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|
>
> topic: Postcoordinated Expression [410619003 |Application (procedure)] ->(363699004 | Direct device (attribute))->[56144002 |Back braces, device (physical object)]
>
> purpose[0]: Postcoordinated Expression [277132007 |Therapeutic procedure (procedure)] ->(363702006 |Has focus (attribute))->[279039007 |Low back pain (finding)]

Lumbosacral corset for lumbar spinal stenosis to improve walking distance

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

> statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|
>
> topic: Postcoordinated Expression [410619003 |Application (procedure)] ->(363699004 | Direct device (attribute))->[bc971b16-e8e0-46a2-a182-1085eb65a57f |Lumbosacral corset (physical object)]
>
> purpose[0]: Postcoordinated Expression [277132007 |Therapeutic procedure (procedure)] ->(363702006 |Has focus (attribute))->[18347007 |Spinal stenosis of lumbar region (disorder)]
>
> unstructured[0]: to improve walking distance

Spinal manipulation provide for symptomatic relief in patients with lumbar disc herniation and radiculopathy

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

> statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|
>
> topic: Precoordinated Expression 44275008 |Manipulation of spine (procedure)|
>
> unstructured[0]: provide for symptomatic relief in patients with lumbar disc herniation and radiculopathy

Chapter 5. Imaging

Consider ordering one of the following imaging studies in conjunction with the neurosurgery consult.

#

MRI lumbar spine without intravenous (IV) contrast (consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention)

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

> statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|
>
> topic: Precoordinated Expression 394451000119106 |Magnetic resonance imaging of lumbar spine without contrast (procedure)|
>
> unstructured[0]: consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention

MRI lumbar spine with and without intravenous (IV) contrast (consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention

MRI lumbar spine with intravenous (IV) contrast (consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention; indeterminate or nondiagnostic MRI without contrast)

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

> statementType: Precoordinated Expression 385644000 | Requested (qualifier value)|
>
> topic: Precoordinated Expression 41333006 |Magnetic resonance imaging of lumbar spine with contrast (procedure)|
>
> unstructured[0]: consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention

MRI lumbar spine without intravenous (IV) contrast (consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention; indeterminate or nondiagnostic MRI without contrast)

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

> statementType: Precoordinated Expression 385644000 | Requested (qualifier value)|
>
> topic: Precoordinated Expression 394451000119106 | Magnetic resonance imaging of lumbar spine without contrast (procedure)|
>
> unstructured[0]: consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention; indeterminate or nondiagnostic MRI without contrast)

MRI lumbar spine with and without IV contrast (consider for persistent, severe, or progressive low back pain; failed conservative management;

candidate for surgical intervention; indeterminate or nondiagnostic MRI without contrast)

MRI lumbar spine with intravenous (IV) contrast (consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention; indeterminate or nondiagnostic MRI without contrast)

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

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

> topic: Precoordinated Expression 41333006 |Magnetic resonance imaging of lumbar spine with contrast (procedure)|

> unstructured[0]: consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention; indeterminate or nondiagnostic MRI without contrast)

MRI lumbar spine without intravenous (IV) contrast (consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention; indeterminate or nondiagnostic MRI without contrast)

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

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

> topic: Precoordinated Expression 394451000119106 | Magnetic resonance imaging of lumbar spine without contrast (procedure)|

> unstructured[0]: consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention; indeterminate or nondiagnostic MRI without contrast)

CT lumbar spine without intravenous (IV) contrast (consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention; MRI contraindicated)

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

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

> topic: Precoordinated Expression 572091000119106 |Computed tomography of lumbar spine without contrast (procedure)|

> unstructured[0]: consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention; MRI contraindicated

CT lumbar spine with intravenous (IV) contrast (consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention; MRI contraindicated)

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

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

topic: Precoordinated Expression 90523008 |Computerized axial tomography of lumbar spine with contrast (procedure)|

unstructured[0]: consider for persistent, severe, or progressive low back pain; failed conservative management; candidate for surgical intervention; MRI contraindicated

Chapter 6. Additional Consults

Consider ordering from the following consults in conjunction with the neurosurgery consult.

#

Consult physical therapy to evaluate for conservative therapy for lumbar thoracic radiculopathy (e.g., structured exercise, electrical stimulation, acupuncture, exercise instruction)

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

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

> topic: Precoordinated Expression 71318009 |Physical medicine consultation and report (procedure)|

> purpose[0]: Postcoordinated Expression [410158009 |Physical therapy assessment (procedure)] ->(363702006 |Has focus (attribute))->[42452002 |Thoracic radiculopathy (disorder)]

> purpose[1]: Postcoordinated Expression [410158009 |Physical therapy assessment (procedure)] ->(363702006 |Has focus (attribute))->[128196005 |Lumbar radiculopathy (disorder)]

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

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

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

> topic: Precoordinated Expression 165172002 |Diagnostic psychiatric interview (procedure)|

> purpose[0]: Postcoordinated Expression [386053000 | Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[365396002 |Finding related to ability to cope with pain (finding)]

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

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

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

> topic: Precoordinated Expression f6368012-f67e-4dfa-af9d-2348ff364b7d |Social services consultation (procedure)|

> purpose[0]: Postcoordinated Expression [386053000 | Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[1181000205104 |Finding related to ability to adhere to conservative treatment (finding)]

Consult pain management to address modalities for treating chronic pain

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

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

topic: Precoordinated Expression 1041000205107 | Consultation for pain management and report (procedure)|

purpose[0]: Postcoordinated Expression [386053000 | Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[408954001 |Chronic pain control (procedure)]

Chapter 7. Patient Education

Consider ordering patient education in conjunction with the neurosurgery consult.

#

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

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

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

topic: Postcoordinated Expression [409073007 |Education (procedure)] ->(363702006 |Has focus (attribute)|)->[128196005 |Lumbar radiculopathy (disorder)]

unstructured[0]: level-appropriate materials on natural progression, conservative management, and procedural management

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

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

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

topic: Postcoordinated Expression [409073007 |Education (procedure)] ->(363702006 |Has focus (attribute)|)->[42452002 |Thoracic radiculopathy (disorder)]

unstructured[0]: level-appropriate materials on natural progression, conservative management, and procedural management

Chapter 8. Tabular List

Terminology Service Request (TSR) Mappings

Table 8.1. Terminology Versions

Name	Identifer	Version
SNOMED CT	2.16.840.1.113883.6.96	United States Edition 20180301

Table 8.2. Terminology References

System	Code	Display Text[a]	References[b]
SNOMED CT	1041000205107 | Consultation for pain management and report (procedure)|	Precoordinated Expression	1
SNOMED CT	165172002 |Diagnostic psychiatric interview (procedure)|	Precoordinated Expression	1
SNOMED CT	258702006 |hour (qualifier value)|	Precoordinated Expression	4
SNOMED CT	258703001 |day (qualifier value)|	Precoordinated Expression	4
SNOMED CT	385218009 |Injection (qualifier value)|	Precoordinated Expression	1
SNOMED CT	385644000 |Requested (qualifier value)|	Precoordinated Expression	21
SNOMED CT	394451000119106 | Magnetic resonance imaging of lumbar spine without contrast (procedure)|	Precoordinated Expression	3
SNOMED CT	41333006 |Magnetic resonance imaging of lumbar spine with contrast (procedure)|	Precoordinated Expression	2
SNOMED CT	421026006 |Oral tablet (qualifier value)|	Precoordinated Expression	3
SNOMED CT	44275008 |Manipulation of spine (procedure)|	Precoordinated Expression	1
SNOMED CT	572091000119106 | Computed tomography of lumbar spine without contrast (procedure)|	Precoordinated Expression	1
SNOMED CT	71318009 |Physical medicine consultation and report (procedure)|	Precoordinated Expression	1

System	Code	Display Text[a]	References[b]
SNOMED CT	90523008 |Computerized axial tomography of lumbar spine with contrast (procedure)|	Precoordinated Expression	1
SNOMED CT	[277132007 |Therapeutic procedure (procedure)] ->(363702006 |Has focus (attribute))->[161891005 | Backache (finding)]	Postcoordinated Expression	4
SNOMED CT	[277132007 |Therapeutic procedure (procedure)] ->(363702006 |Has focus (attribute))->[18347007 | Spinal stenosis of lumbar region (disorder)]	Postcoordinated Expression	1
SNOMED CT	[277132007 |Therapeutic procedure (procedure)] ->(363702006 |Has focus (attribute))->[279039007 | Low back pain (finding)]	Postcoordinated Expression	1
SNOMED CT	[386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[1181000205104 |Finding related to ability to adhere to conservative treatment (finding)]	Postcoordinated Expression	1
SNOMED CT	[386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[365396002 | Finding related to ability to cope with pain (finding)]	Postcoordinated Expression	1
SNOMED CT	[386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[408954001 |Chronic pain control (procedure)]	Postcoordinated Expression	1
SNOMED CT	[409073007 |Education (procedure)] ->(363702006 |Has focus (attribute)|)->[128196005 |Lumbar radiculopathy (disorder)]	Postcoordinated Expression	1
SNOMED CT	[409073007 |Education (procedure)] ->(363702006 |Has focus (attribute)|)-	Postcoordinated Expression	1

System	Code	Display Text[a]	References[b]
	>[42452002 |Thoracic radiculopathy (disorder)]		
SNOMED CT	[410158009 |Physical therapy assessment (procedure)] ->(363702006 |Has focus (attribute))->[128196005 |Lumbar radiculopathy (disorder)]	Postcoordinated Expression	1
SNOMED CT	[410158009 |Physical therapy assessment (procedure)] ->(363702006 |Has focus (attribute))->[42452002 |Thoracic radiculopathy (disorder)]	Postcoordinated Expression	1
SNOMED CT	[410619003 |Application (procedure)] ->(363699004 |Direct device (attribute))->[56144002 |Back braces, device (physical object)]	Postcoordinated Expression	1
SNOMED CT	[410619003 |Application (procedure)] ->(363699004 |Direct device (attribute))->[bc971b16-e8e0-46a2-a182-1085eb65a57f | Lumbosacral corset (physical object)]	Postcoordinated Expression	1
SNOMED CT	[416118004 | Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 | Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;197805 Ibuprofen 400 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]	Postcoordinated Expression	1
SNOMED CT	[416118004 | Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 | Administration - action (qualifier value)] ->(363701004 |Direct substance	Postcoordinated Expression	1

System	Code	Display Text[a]	References[b]
	(attribute))->[Rx;259966 methylPREDNISolone 4 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]		
SNOMED CT	[416118004 | Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 | Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;313782 Acetaminophen 325 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 | Oral (qualifier value)]	Postcoordinated Expression	1
SNOMED CT	[416118004 | Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 | Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;849431 Naproxen sodium 550 MG Oral Tablet] ->(410675002 | Route of administration (attribute))->[260548002 | Oral (qualifier value)]	Postcoordinated Expression	1
SNOMED CT	[432406007 |Epidural injection using computed tomography guidance (procedure)] ->(260686004 |Method (attribute))->[129326001 |Injection - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[116596006 | Glucocorticoid preparation (product)|	Postcoordinated Expression	1
SNOMED CT	f6368012-f67e-4dfa-af9d-2348ff364b7d |Social	Precoordinated Expression	1

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System	Code	Display Text[a]	References[b]
	services consultation (procedure)|		

[a]If a code is used multiple times in the KNART, only the display text of the first instance is shown.

[b]Count of the number of times the given code system and code pair is used in the KNART.

Chapter 9. Behavior Symbols

Table 9.1. Group Organizational Behavior

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

Table 9.2. Group Selection Behavior

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

Table 9.3. Required Behavior

Symbol	Name	Definition
◆	Must	An action with this behavior must be included in the actions processed by the end user; the end user may not choose not to include this action.
◇	Could	An action with this behavior may be included in the set of actions processed by the end user.

Symbol	Name	Definition
➢	MustUnlessDocumented	An action with this behavior must be included in the set of actions processed by the end user, unless the end user provides documentation as to why the action was not included.

Table 9.4. Precheck Behavior

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

Table 9.5. Cardinality Behavior

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

Table 9.6. Item Flags

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

Table 9.7. Read Only Behavior

Symbol	Name	Definition
#	true	For a particular action or action group, specifies whether the elements are read only.

Appendix A. References

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

List of References

Related Resources

[CCWP] *Neurosurgery: Radiculopathy (Lumbar /Thoracic) Clinical Content White Paper*

[CSD] *Neurosurgery: Radiculopathy (Lumbar Thoracic) Order Set Conceptual Structure Document*

[KVRpt] *Neurosurgery: Radiculopathy (Lumbar Thoracic) Order Set KNART Validation Report*

Supporting Evidence

[Kaiser 2014] *Kaiser, Michael G, Jason C Eck, Michael W Groff, Zoher Ghogawala, William C Watters, Andrew T Dailey, Daniel K Resnick, et al 2014. "Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine" Journal of Neurosurgery Spine 21 (1): 133–39. doi:10.3171/2014.4.SPINE14326.* (link [https://doi.org/10.3171/2014.4.SPINE14326])

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[Kreiner 2014] *Kreiner, D. Scott, Steven W Hwang, John E Easa, Daniel K Resnick, Jamie L Baisden, Shay Bess, Charles H Cho, et al. 2014. "An Evidence-Based Clinical Guideline for the Diagnosis and Treatment of Lumbar Disc Herniation with Radiculopathy." The Spine Journal: Official Journal of the North American Spine Society 14 (1): 180–91. doi:10.1016/j.spinee.2013.08.003* (link [http://www.spine.org/Pages/PracticePolicy/ClinicalCare/ClinicalGuidlines/Default.aspx])

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[Patel, 2015] *Patel, ND, Broderick, DF, Burns, J, et al. 2015. "Expert Panel on Neurologic Imaging. ACR Appropriateness Criteria: Low Back Pain. American College of Radiology" https://acsearch.acr.org/docs/69483/Narrative/. Revised 2015.* (link [https://acsearch.acr.org/docs/69483/Narrative/])

[NLM 2016a] *MEDROL- methylprednisolone tablet [Internet]: U.S. National Library of Medicine. 2016. Available from: https://dailymed.nlm.nih.gov/dailymed/*

drugInfo.cfm?setid=39d5270b-d957-4821-93d6-501b7b9f02d4 (link [https://dailymed.nlm.nih.gov/ dailymed/drugInfo.cfm?setid=39d5270b-d957-4821-93d6-501b7b9f02d4])

[NLM 2016b] *NAPROSYN- naproxen tablet; EC-NAPROSYN- naproxen tablet, delayed release; NAPROSYN- naproxen suspension; ANAPROX- naproxen sodium tablet; ANAPROX DS-naproxen sodium tablet [Internet].: National Library of Medicine; 2016. Available from: https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=68848217-03c9-4377-9be6-6f567e629129.* (link [https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=68848217-03c9-4377-9be6-6f567e629129.])

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