

A3

<u>Step</u>	<u>Data item</u>	<u>Representation</u>	<u>Rep.</u>
Adults with low back limitations not improving over 4 weeks	Age	<i>ClinicalAttribute</i> <i>Name:age</i> <i>Time</i> <i>Value</i> <i>Unit:year</i>	<i>Age.instance.value > 18</i>
	activity intolerance due to low back pain and/or back-related leg symptoms	<i>Symptom</i> <i>Name: activity intolerance due to low back pain and/or back-related leg symptoms</i> <i>Time:</i> <i>Start_time</i> <i>End_time</i> <i>Duration</i> <i>Location:</i> <i>No_of_events</i> <i>Severity</i> <i>Quality</i> <i>Moderating factors</i>	I1 = get (activity intolerance due to low back pain and/or back-related leg symptoms, last, before (activity intolerance due to low back pain and/or back-related leg symptoms – 4 weeks, last) I2 = get (activity intolerance due to low back pain and/or back-related leg symptoms, last)
	activity intolerance due to low back pain and/or back-related leg symptoms	<i>Symptom</i> <i>Name: activity intolerance due to low back pain and/or back-related leg symptoms</i> <i>Time:</i> <i>Start_time</i> <i>End_time</i> <i>Duration</i> <i>Location:</i> <i>No_of_events</i> <i>Severity</i> <i>Quality</i> <i>Moderating factors</i>	I_1.instance.severity <= I_2.instance.severity
Second Physical and History	Physical exam and History	<i>Diagnostic Procedure</i>	
Neurological symptoms in lower limb(s)?	Neurological symptoms in lower limb(s)	<i>Symptom</i> <i>Name:Lower back pain</i> <i>Time:</i> <i>Start_time</i> <i>End_time</i> <i>Duration</i> <i>Location: lower limbs</i> <i>No_of_events</i> <i>Severity</i> <i>Quality</i> <i>Moderating factors</i>	<i>Lower_back_pain.instance.associated_symptoms == Neurological_symptoms</i>
Significant sciatica present > 4 weeks	Lower back pain	<i>Symptom</i> <i>Name: Lower back pain</i> <i>Time:</i> <i>Start_time</i> <i>End_time</i> <i>Duration</i> <i>Location:</i>	<i>Lower back pain.instance.Associated_symptoms == sciatica and Lower back pain.instance.Associated_symptoms.instance.duration > 4 weeks</i>

		No_of_events Severity Quality Associated symptoms Moderating factors	
Primarily low back symptoms		<i>Symptom</i> Name: Lower back pain Time: Start_time End_time Duration Location: No_of_events Severity Quality Moderating factors	Lower_back_pain.instance.associated_symptoms != Neurological_symptoms
Evaluate for specific suspected conditions: CBC, ESR, AP/lateral x-rays, bone scan	Evaluate for specific suspected conditions	<i>Message_Action_Spec</i> Message: Evaluate for specific suspected conditions. Suggested tests may include: CBC, ESR, AP/lateral x-rays, bone scan Destination:	
Tests for specific suspected conditions	Tests for specific suspected conditions	<i>DiagnosticProcedure</i> Name: Time_of_observation: Start_time: End_time: Status: to_be_ordered Result:	
Test results positive? (The decision is triggered by the tests status being “results available”)	Test results	List of <i>TestResult</i> (Name: Time_of_observation: Time_performed: Test_value:) n	for (int i=0; i<len(List of TestResult); i++) { if List of TestResult[i].is_positive() return true; } return false;
Age-related changes only?	Test results	List of <i>TestResult</i>	for (int i=0; i<len(List of TestResult); i++) { if List of TestResult[i].is_positive() && equal((Age), TestResult[i].Explained_by()) return true; } return false;
Evaluate as indicated	Evaluate as indicated	<i>Message_Action_Spec</i> Message: Evaluate as indicated Destination:	
Obvious level of nerve root dysfunction on physical examination?	Obvious level of nerve root dysfunction on physical examination	<i>Diagnostic Procedure</i> Location: Status: was_performed Start_time: End_time:	Physical Exam.Diagnostic Procedure.Test result == “obvious level of nerve root dysfunction” (CategoricalResult)

		Name: physical exam Observation_time:	
EMG (SEP)	EMG (SEP)	<i>Diagnostic Procedure</i> Name:EMG Status:	Status = order
		<i>Diagnostic Procedure</i> Name:SEP Status:	If (Age.ClinicalAttribute.value > 50 && Age.ClinicalAttribute.units == year) then SEP.status = order
	Age	<i>Clinical Attribute</i> value: units:	
Evidence of nerve root dysfunction on EMG/SEP?	Evidence of nerve root dysfunction on EMG/SEP	<i>Diagnostic Procedure</i> Location: Status: was_performed Start_time: End_time:	EMG.Diagnostic Procedure.Test result == “evidence of nerve root dysfunction” .SEP.Diagnostic Procedure.Test result == “evidence of nerve root dysfunction”
Consult surgeon about choice of imagining study (MRI, CT) to define nerve root compression	PreReferralAction	<i>PreReferralAction</i> From: To: Purpose: Expected answer: Urgency	Purpose == “characterize nerve root compression” Expected answer = imaging study type
Imaging Study	Imaging Study	<i>Diagnostic Procedure</i>	Imaging Study.Diagnostic Procedure.name == PreRefferalAction.ExpectedResult.status = order
Physiologic and anatomic evidence indicates nerve root compression?	Physiologic and anatomic evidence indicates nerve root compression	<i>Diagnostic Procedure</i>	Imaging Study.Diagnostic Procedure.name == PreRefferalAction.ExpectedResult.result == “nerve root compression” (Text Result)

Unexplained weight loss	Unexplained weight loss	<i>Symptom</i> <i>Name:</i> Unexplained weight loss <i>Time:</i> <i>Start_time</i> <i>End_time</i> <i>Duration</i> <i>Location:</i> <i>No_of_events</i> <i>Severity</i> <i>Quality</i> <i>Moderating factors</i>	Unexplained weight loss.instance == true
Failure to improve with one month of therapy	Activity intolerance due to low back pain and/or back-related leg symptoms.	<i>Symptom</i> <i>Name:</i> activity intolerance due to low back pain and/or back-related leg symptoms. <i>Time:</i> <i>Start_time</i> <i>End_time</i> <i>Duration</i> <i>Location:</i> <i>No_of_events</i> <i>Severity</i> <i>Quality</i> <i>Moderating factors</i>	*I_1 = get (activity intolerance due to low back pain and/or back-related leg symptoms, last, less(<i>pain killer for LBP.start_time</i>) *I_2 = get (activity intolerance due to low back pain and/or back-related leg symptoms, last, more(<i>pain killer for LBP.start_time</i> + 1 month))
	Lower back pain drug therapy	<i>Drug</i> <i>Name:</i> <i>pain killer for LBP time</i> <i>Start_time</i> <i>End_time</i> <i>Duration</i> <i>Dose</i> <i>unit</i>	I_1.instance.severity <= I_2.insrtance.severity
Bed rest no relief	Low back pain	<i>Symptom</i> <i>Name:</i> Low back pain <i>Start_time</i> <i>End_time</i> <i>Duration</i> <i>Location:</i> <i>No_of_events</i> <i>Severity</i> <i>Quality</i> <i>Moderating factors:</i>	Low back pain.instance.moderating_factor. != Bed rest
Duration of pain > 1 month	Low back pain	<i>Symptom</i> <i>Name:</i> Low back pain. <i>Time:</i> <i>Start_time</i> <i>End_time</i> <i>Duration</i> <i>Location:</i> <i>No_of_events</i> <i>Severity</i> <i>Quality</i> <i>Moderating factors</i>	Low back pain.instance.duration > 1 month

Intravenous drug abuse	Intravenous drug abuse	<i>Diagnosis</i> <i>Name:</i> Intravenous drug abuse <i>Time</i> <i>start_time</i> <i>end_time</i> <i>duration</i>	Intravenous drug abuse.instance == true Intravenous drug abuse.instance.end_time > Lower back pain.instance.start_time
Urinary tract infection	Urinary tract infection	<i>Diagnosis</i> <i>Name:</i> Urinary tract infection <i>start_time</i> <i>end_time</i> <i>duration</i>	Urinary tract infection.instance==true Urinary tract infection.instance.end_time > Lower back pain.instance.start_time
Skin infection	Skin infection	<i>Diagnosis</i> <i>Name:</i> Skin infection <i>start_time</i> <i>end_time</i> <i>duration</i>	Skin infection.instance==true Skin infection.instance.end_time > Lower back pain.instance.start_time
Trauma	Trauma	<i>Diagnosis</i> <i>Name:</i> Trauma <i>start_time</i> <i>end_time</i> <i>duration</i>	Trauma ==true Trauma.instance.end_time > Lower back pain.instance.start_time
corticosteroid	corticosteroid	<i>Drug</i> <i>Name:</i> <i>Time</i> <i>Start_time</i> <i>End_time</i> <i>Duration</i> <i>Dosage</i> <i>unit</i>	Corticosteroid.instance == true
Sciatica	Lower back pain	<i>Symptom</i> <i>Name:</i> Lower back pain <i>Time:</i> <i>Start_time</i> <i>End_time</i> <i>Duration</i> <i>Location:</i> <i>No_of_events</i> <i>Severity</i> <i>Quality</i> <i>Associated symptoms</i> <i>Moderating factors</i>	Lower back pain.instance. Associated symptoms == sciatica

pseudoclaudication	Lower back pain	<i>Symptom</i> <i>Name:</i> Lower back pain Time: Start_time End_time Duration Location: No_of_events Severity Quality Associated symptoms Moderating factors	Lower back pain.instance. Associated symptoms == pseudoclaudication
morning stiffness	Lower back pain	<i>Symptom</i> <i>Name:</i> Lower back pain Time: Start_time End_time Duration Location: No_of_events Severity Quality Associated symptoms Moderating factors	Lower back pain.instance. Associated symptoms == morning stiffness