

PDPM Grouper JAR Package V2.4000

Centers for Medicare & Medicaid Services

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Table of Contents

Introduction.....	2
Disclaimer.....	2
Description	2
Interfacing with the JAR	3
Parameter Definitions.....	3
Errors.....	4
Test Data.....	5
Version History	5
DLL Version History.....	5
JAR Version History	6
Contact Information.....	7

Introduction

This is the 14th revision to the initial release of the Patient-Driven Payment Model (PDPM) Grouper software. This is an update to the release V2.23000 of the PDPM Grouper as a Java Archive (JAR) library. A list of previous DLL and JAR versions will be maintained in the Version History section of this document.

Effective beginning October 1, 2019, the PDPM began to be used under the Skilled Nursing Facility (SNF) Prospective Payment System (PPS) for classifying SNF patients in a covered Part A stay.

Effective beginning October 1, 2020, the PDPM began to be used for OBRA assessments where A0310A = [01,02,03,04,05,06] and A0310B = [99] and target date was on or after October 1, 2020.

Please note the following:

- Use of the PDPM for OBRA assessment calculation is state-optional – each state must specify whether it requires the PDPM calculation for its OBRA's.
- FY2025 ICD-10 primary codes must be used for I0020B in these assessments.
- Also, FY2025 ICD-10 secondary codes must be used for the I8000A-J items in these assessments.

For detailed information on the PDPM logic, please visit <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/MDS30RAIManual.html> and refer to Chapter 6 in the latest version of the RAI Manual.

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Description

This package contains the Java source code as well as a compiled Java Archive (JAR) library.

NOTE: This package is intended for vendors/developers to include in their software.

Interfacing with the JAR

There are six public methods provided for use by other programs to pass MDS information into the PDPM grouper.

Method 1: *Pdpm.exec (String line) // for fixed-length structured Strings*

Method 2: *Pdpm.xmlStringExec (String xml) // for xml structured Strings*

Method 3: *Pdpm.exec (SnfClaim claim)*

Method 4: *Pdpm.exec (File snfFile)*

Method 5: *Pdpm.stringExec (String line) //for C++ to call the jar*

Method 6: *Pdpm.exec (Path path, Consumer<SnfClaim> additionalPostProcessing) //for 32-bit JDK processing large data set*

Note: While there are six public methods, there are other protected methods with similar names and parameters that are used for testing and do not need to be used by end users for processing.

Descriptions of the necessary classes, methods, input parameters and return values are described below.

Parameter Definitions

Class: Pdpm.java			
Parameter Name	Parameter Type	Data Type	Description
line	Input	String	A 3690-byte fixed-length string containing an MDS assessment in the format defined by the MDS 3.0 Data Specifications V3.00.1, which went into production on October 1st, 2019.
xml	Input	String	An XML structured String with a single MDS assessment
claim	Input	SnfClaim	SnfClaim is a Java class contained in the PDPM Grouper JAR with fields to store the relevant inputs and outputs related to an MDS assessment.
snfFile	Input	File	A java.io.File containing either one or more fixed-length strings containing MDS assessments with a txt extension or an XML file containing one MDS assessment with an xml extension.
path	Input	Path	A java.nio.file.Path for path to the input file
additionalPost Processing	Input	Consumer< SnfClaim>	Custom post processing result for low memory system (for java 32-bit JDK)

Class: SnfClaim.java				
Parameter Name	I/O	Data Type	Method	Description
assessmentSystem	I	String	setAssessmentSystem	MDS Assessment System Code
birthdate	I	LocalDate	setBirthDate	java.time.LocalDate representing the birth date of the patient in the MDS assessment
admissionDate	I	LocalDate	setAdmissionDate	java.time.LocalDate representing the admission date of the patient in the MDS assessment

Class: SnfClaim.java				
Parameter Name	I/O	Data Type	Method	Description
assessments	I	List<Assessment>	setAssessments(List), addAssessment(Assessment)	Quality measures of the patient in the MDS assessment consisting of: <ul style="list-style-type: none"> String – name String – item Integer – value boolean – isBlank boolean – isAssessed Assessment.java located in gov.cms.grouper.snf.model package.
dischargeDate	I	LocalDate	setDischargeDate	java.time.LocalDate representing the discharge date of the patient in the MDS assessment
assessmentReferenceDate	I	LocalDate	setAssessmentReferenceDate	java.time.LocalDate representing the assessment reference date (target date) of the patient in the MDS assessment
primaryDiagnosis	I	SnfDiagnosisCode	setPrimaryDiagnosis	Primary diagnosis of the MDS assessment consisting of: <ul style="list-style-type: none"> String – value String – clinicalCategory String – speechCategory String - nutritionalCategory SnfDiagnosisCode.java located in gov.cms.grouper.snf.model package.
obra	I	Integer	setObra	The OBRA value on the MDS assessment
secondaryDiagnoses	I	List<SnfDiagnosisCode>	setSecondaryDiagnoses(List), addSecondaryDiagnosis(SnfDiagnosisCode)	The secondary diagnoses of the MDS assessment consisting of: <ul style="list-style-type: none"> String – value String – clinicalCategory String – speechCategory String - nutritionalCategory SnfDiagnosisCode.java located in gov.cms.grouper.snf.model package.
hippsCode	O	String	getHippsCode	The resulting 5-character HIPPS Code returned by the method.
errors	O	List<String>	getErrors	A java.util.List of Strings comprised of an error number and the error description. If no errors were encountered in the processing then the list will be empty.
version	O	Int	getVersion	An int representing the current component version of the PDPM grouper used to calculate the HIPPS Code.

In addition to retrieving the output from the SnfClaim object via the output methods listed above, the fixed length MDS string, including calculated HIPPS code and version, can be retrieved by passing the processed claim into `Pdpm.getClaimFixedString(SnfClaim snfClaim)`.

Errors

Each SnfClaim object can store a List<String> of errors. Multiple errors can exist on the same SnfClaim object. The list of possible errors is contained in the table below.

Error String
0) "Assessment reference date is missing or is invalid: <value>"
1) "Invalid A0310A: <value> or A0310B: <value>"
2) "Line length is less than 3688 bytes (<value>); PDPM Grouper unable to process further."
3) "Unknown process error: <message>"

Test Data

Test submission data files have been provided in the zip file “PDPM_V2.4000_Test_Data.zip”, so that vendors may confirm that their software is generating the correct results. The correct PDPM score and version for each assessment are stored in Z0100A (positions 1344-1350 of the assessment fixed-length string) and Z0100B (positions 1351-1360 of the assessment fixed-length string).

Version History

DLL Version History

Version	Comments
1.0000	This was the initial production release.
1.0001	This was a jRAVEN-only release, and not available separately. It resolved the following issues: <ul style="list-style-type: none"> - In the method BehavioralSymptomsStep2 the value of 0 was treated as a not assessed/not complete. As a result the staff assessment was being used to determine cognitive performance. - The ConversionFunctionTwoDigit function was not handling the “-“ and “^” characters, which was resulting in the default 0 being returned. - When determining the NTA score for number of “Stage 4 Unhealed Pressure Ulcer Currently present” the value must be greater than 0. The method DetermineUnhealedPressure only checked for a value of 1.
1.0002	This was the second production release. It resolved the following issues: <ul style="list-style-type: none"> - The code “CheckImpairment = (ImpairIndicate1, ImpairIndicate2)” was incorrect, and was modified to be “CheckImpairment = CheckImpair(ImpairIndicate1, ImpairIndicate2).” - There are 20 ICD codes that can score under multiple conditions for the NTA component. The PDPM code was only allowing those ICD codes to score once.
1.0003	This was the third production release. It resolved the following issues: <ul style="list-style-type: none"> - SLP Category: Modified logic to account for [S020XXD] in I0020B when Non-Orthopedic Surgery eligible and the patient has had a recent surgery that is a non-orthopedic Surgery. - SLP Category: Modified the logic to account for [S34111D] in I0020B when Orthopedic Surgery eligible and the patient has NOT had a recent surgery. - Cognitive Level: Modified the code so that it applies logic to look for “1” in B0100 instead of looking for “01”. - In the event an ICD10 code was not found in the applicable list for item I0020B, the method DeterminePrimaryDiagnosis returned an index of 0, which was incorrectly indicating the code “A000” and, therefore, the clinical category “Acute Infections” instead of being handled as a “Return to Provider.” It was modified to return -1.
1.0004	This is the fourth production release. It adds support for the new COVID-19 ICD-10-CM code, U07.1, which is a valid code for use with MDS assessments with target date on or after April 1, 2020.
1.0005	This was the BETA for the fifth production release. It supported calculation of HIPPS codes for assessments with A0310A = [01,02,03,04,05,06] and A0310B = [99]. It DID NOT contain support for FY2021 ICD-10 codes, which will be used with MDS assessments with target date on or after October 1, 2020. For the BETA, FY2020 codes were used for all MDS assessments. Note that the BETA documentation indicated that the Version value was 1.0005B; however, the DLL was actually returning 1.0005. Therefore, it was decided to increment the product version to 1.0006.
1.0006	This was the sixth release (fifth production release, since 1.0005 was a beta release). As with the previous beta release, it supported calculation of HIPPS codes for assessments with A0310A = [01,02,03,04,05,06] and A0310B = [99]. It also contained support for

Version	Comments
	<p>FY2021 ICD-10 codes, which must be used for MDS assessments with target date on or after October 1, 2020.</p> <p>IMPORTANT NOTE: The I8000A-J items began to be versioned in the grouper. Therefore, FY2021 ICD-10 codes must be used for the I8000A-J items for MDS assessments with target date on or after October 1, 2020.</p>
1.0007	<p>This is the seventh release (sixth production release, since 1.0005 was a beta release). This release adds six ICD-10 codes that were inadvertently excluded from the NTA calculation in V1.0006:</p> <ul style="list-style-type: none"> • T8484XA • T8389XA • T8321XA • T82399A • T82392A • T83021A
1.0008	<p>This is the eighth release (seventh production release, since 1.0005 was a beta release). This release corrects an issue with a dynamic array that was not consistently reinitialized when processing multiple assessments within a short time frame. This occasionally caused incorrect PDPM recalculation results when processing pre- and post- 10/01/2020 assessments.</p>
1.0009	<p>This is the ninth release (eighth production release, since 1.0005 was a beta release). This release adds support for new ICD-10 codes that can be used for assessments with target date of January 1, 2021 and later: Z11.52, Z20.822, Z86.16, M35.81, M35.89 and J12.82. Note that one ICD-10 code that was already in production, M35.8, will not be allowed in assessments with target date on or after January 1, 2021, since it is replaced by the two new codes, M35.81 and M35.89.</p> <p>UPDATE: In addition, there were three sets of NTA Comorbidity mappings that were incorrect for ICD-10 changes made on 10/01/2020. The following corrections were made:</p> <ol style="list-style-type: none"> 1. Immune Disorders (RxCC97): D848 removed; D8481, D84821, D84822, D8489 added. 2. Pulmonary Fibrosis and Other Chronic Lung Disorders (RxCC227): J8417 removed; J84170, J84178 added. 3. Complications of Specified Implanted Device or Graft (RxCC176): T86842 removed; T868421, T868422, T868423, T868429 added.

JAR Version History

Version	Comments
2.0000_B ETA	<p>This is the first public version of the JAR. It is released as a beta version which replicates the DLL v1.0009 functionalities and underlying logic. It DOES NOT contain support for FY2022 ICD-10 codes, which will be used with MDS assessments with target date on or after October 1, 2021. For the BETA, FY2021 codes were used for all MDS assessments.</p>
2.0000	<p>This is the second release of the JAR. It contains support for FY2022 ICD-10 codes which are used with MDS assessments with a target date on or after October 1, 2021. This release supports processing of records back to v1.0003, with a target date on or after October 1, 2019.</p> <p>UPDATE: In addition, there were logic updates to the NTA Comorbidity Score Calculation. Item M1040B has now been combined with M1404A and M1040C; now when any of these three MDS items is present, it adds one point, at most, to the total NTA score.</p>
2.0001	<p>This is the third release of the Jar (second production release). This release resolved the following issues:</p>

Version	Comments
	<ul style="list-style-type: none"> - Correction of a logic issue on “Behavioral Symptoms and Cognitive Performance” under Nursing payment component. When C0100 and C0500 are both dashes (not assessed), the grouper returned an incorrect nursing classification. - NTA comorbidity score calculation issue fixed. It was calculating I8000: End-Stage Liver Disease and I8000: Immune Disorders as 2 points each but those should only count as 1 point each.
2.0002	<p>This is fourth release of the Jar (third production release). This release resolved the following issues:</p> <ul style="list-style-type: none"> - Diagnosis code mapping to NTA comorbidities could have 1 to 2 mappings. Before only 1 to 1 mappings were captured from the PDPM_ICD10_Mappings_FY20XX excel sheet. List of diagnosis codes updated: D89810, D89811, D89812, D89813, K7041, M3211, M3213, M3301, M3311, M3321, M3391, M3481, T8630, T8631, T8632, T8633, T8639, Z48280, Z943 - NTA comorbidity description fix for “Disorders of Immunity - Except: RxCC97: Immune Disorders”. Previous incorrect spacing in the description resulted in point not adding up correctly during NTA comorbidity score calculation.
2.0003	<p>This release updated the Log4j library to version 2.17.1 to patch some security vulnerabilities that was found with that library.</p> <p>No changes to PDPM logic.</p>
2.1000	<p>This release was updated to support FY2023 ICD-10 codes which are used with MDS assessments with a target date on or after October 1, 2022.</p> <p>UPDATE:</p> <ol style="list-style-type: none"> 1) When the ICD-10 code in item I0020B (Primary Medical Condition) has a Clinical Category of "Return to Provider", the RECALCULATED_Z0100A (recalculated HIPPS code) will not be output for 5-day or IPA assessments, but will still be output for OBRA assessments, as long as the ICD-10 code is a valid code. 2) Jars are packaged differently (snf-x.x.x-jar-with-dependencies removed). Instead, jars in the “lib” folder should be included on the classpath to avoid compilation issues (refer to snf.bat). 3) The software now uses a Protobuf bin file in place of the original/plain CSV files for processing; however, to maintain consistency, we are still providing the corresponding CSV files in the src\main\resources\specTableCSV folder.
2.2000	<p>This release was updated to support FY2024 ICD-10 codes which are used with MDS assessments with a target date on or after October 1, 2023.</p> <p>This release was also updated to support the following MDS Items (left) being changed to new MDS Items (right):</p> <p>D0300 -> D0160</p> <p>K0510A1 -> K0520A2</p> <p>K0510A2 -> K0520A3</p> <p>K0510B1 -> K0520B2</p> <p>K0510B2 -> K0520B3</p> <p>K0510C2 -> K0520C3</p>

Version	Comments
	<p>O0100A2 -> O0110A1B</p> <p>O0100B2 -> O0110B1B</p> <p>O0100C2 -> O0110C1B</p> <p>O0100D2 -> O0110D1B</p> <p>O0100E2 -> O0110E1B</p> <p>O0100F2 -> O0110F1B</p> <p>O0100H2 -> O0110H1B</p> <p>O0100I2 -> O0110I1B</p> <p>O0100J2 -> O0110J1B</p> <p>O0100M2 -> O0110M1B</p> <p>Zip file PDPM_V2.2000_INTERNAL_DATA.zip created to store the internal data of the component. They will no longer reside in src\main\resources\specTableCSV.</p>
2.2001	<p>This release was updated to adjust the OBRA logic for target date on or after October 1, 2023.</p> <p>Where standalone OBRA assessments will be treated similarly to that of the interim payment assessments.</p> <p>This means that:</p> <p style="padding-left: 40px;">If A0310A=01 (OBRA) and A0310B=99 (PPS), use column 1 (GGxxxxx1)</p> <p style="padding-left: 40px;">If A0310A=02-06 (OBRA) and A0310B=99 (PPS), use column 5 (GGxxxxx5)</p>
2.2002	<p>Clinical category assignments and data related to Orthopedic surgery eligibility were changed for certain codes to reflect changes finalized in the FY2024 SNF PPS Final rule, consistent with proposed changes in the FY2024 SNF PPS Proposed rule.</p>
2.3000	<p>This release was updated to support FY2025 ICD-10 codes which are used with MDS assessments with a target date on or after October 1, 2024.</p> <p>Additionally, JAR support for XML files and a new method for XML Strings was added. Here are the methods affected:</p> <ol style="list-style-type: none"> 1. <i>Pdpm.xmlStringExec</i> - Added to accept XML structured Strings for single MDS claims. 2. <i>Pdpm.exec(File snfFile)</i> - Modified to accept XML files containing single MDS claims. 3. <i>Pdpm.exec(Path path, Consumer<SnfClaim> additionalPostProcessing)</i> - Modified to accept paths to XML files containing single MDS claims.
2.4000	<p>This release was updated to support FY2026 ICD-10 codes which are used with MDS assessments with a target date on or after October 1, 2025. As part of this release, 487 clinical category mappings were added, 28 clinical category mappings were removed, and 34 clinical category mappings were modified. Additionally, 3 NTA comorbidities were added and 1 NTA comorbidity was removed. Refer to the tables in PDPM_V2.4000_Internal_Data.zip for more details.</p> <p>NOTE: Version 2.4000 was compiled using Java version 17 and will run on version 17 and higher. It cannot be run on version 8 or any version lower than 17</p>

Contact Information

Please report any issues by contacting the Grouper Support team, using the following email address:
GrouperBetaTesting@cms.hhs.gov.