

Medicare Severity Diagnosis Related Groups (MS-DRG) Software

Java API guide

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Medicare Severity Diagnosis Related Groups (MS-DRG) Software Java API Guide

This document describes how to call the MS-DRG Software from a Java® application. It also notes the necessary dependencies required to execute the MS-DRG Software. Suggested system requirements are also provided. The use of MS-DRG software outside of a Java calling program is also possible but outside the scope of this document. There is also an included sources jar for MS-DRG.

System requirements

Oracle®, OpenJDK, or other Java® Version 8 or greater.

Dependency information

Table 1. Solventum open source dependencies

Jar name	Version	Purpose	Information
gfc-base-api-3.4.9.jar	3.4.9	Grouper Foundation Class Common grouper calling framework and common business objects to standardize grouper development https://github.com/solventum-oss/GFC-Grouper-Foundation-Classes	Solventum created open source binary

Table 2. Third party open source dependencies

Third party software name	Version	Are the distributed binaries modified by Solventum?	Purpose	Licensing
Google Protocol Buffers Distributables: protobuf-java-3.22.2.jar URL: https://developers.google.com/protocol-buffers	3.22.2	No modification / Not a derivative work; only aggregated with Solventum software.	Embedded content storage/ processing speed optimization	Copyright 2021 Google Inc. All rights reserved License Type: New BSD License URL: https://ptolemy.berkeley.edu/ptolemyII/ptII1.0/ptII/lib/protobuf-license.htm

Third party software name	Version	Are the distributed binaries modified by Solventum?	Purpose	Licensing
SLF4J API Distributables: slf4j-api-.jar URL: http://www.slf4j.org/	1.7.36	No modification / Not a derivative work; only aggregated with Solventum software.	Logging	Copyright (c) 2004-2017 QOS.ch License Type: SLF4j (MIT License) URL: http://www.slf4j.org/license.html

Table 3. Included Dependencies

Jar name	Version	Purpose	Information
msdrg-model-v2 2.6.0.jar	2.6.0	Provide access to component objects.	Contained in ZIP file, Separate *-sources Jar file also included
msdrg-v420-42.0.3.3.jar	42.0.3.3	The MsDrg implementation and embedded content.	Contained in ZIP file. Separate *-sources Jar file also included
msdrg-binary-access-1.2.6.jar	1.2.6	Provides access to component data	Contained in ZIP file. Separate *-sources Jar file also included

Calling the MS-DRG application

The MS-DRG application can be called using the following steps:

1. Include the required dependencies on the classpath.
2. Initialize `MsdrgruntimeOption` to set the component grouping configurations (see Class `MsdrgruntimeOption` (page [12](#))).
3. Initialize and populate `RuntimeOptions` to set the individual runtime configuration options (see Class `RuntimeOptions` (page [10](#))).
4. Set `RuntimeOptions` on `MsdrgruntimeOption`.
5. Populate and build class `MsdrgruntimeInput` to set patient demographic and claim information (see Class `MsdrgruntimeInput`) (page [14](#)). This is done by creating lists of `MsdrgruntimeInputPrCode` and `MsdrgruntimeInputDxCODE` and enums using the various “with” methods from `MsdrgruntimeInputBuilder` to populate the Input followed by calling the `.builder()` method to create an immutable object.
6. Initialize `MsdrgruntimeComponent` and pass in `MsdrgruntimeOption` as a parameter to create a new instance of the component (see Class `MsdrgruntimeComponent`) (page [12](#)).

7. Use the `process()` method on `MsdrComponent` and pass in `MsdrClaim` as a parameter to group the claim.
8. Use the `.getOutput()` method on `MsdrClaim` to get the results of grouping (see Class `MsdrClaim` (page [13](#))).

Sample code

This sample code illustrates the prior steps using hardcoded claim information.

```
import com.mmm.his.cer.foundation.exception.FoundationException;
import com.mmm.his.cer.foundation.model.GfcPoa;
import gov.agency.msdr.model.v2.MsdrOption;
import gov.agency.msdr.model.v2.MsdrRuntimeOption;
import gov.agency.msdr.model.v2.RuntimeOptions;
import gov.agency.msdr.model.v2.enumeration.MarkingLogicTieBreaker;
import gov.agency.msdr.model.v2.enumeration.MsdrAffectDrgOptionFlag;
import gov.agency.msdr.model.v2.enumeration.MsdrDischargeStatus;
import gov.agency.msdr.model.v2.enumeration.MsdrHospitalStatusOptionFlag;
import gov.agency.msdr.model.v2.enumeration.MsdrSex;
import gov.agency.msdr.model.v2.transfer.MsdrClaim;
import gov.agency.msdr.model.v2.transfer.input.MsdrInput;
import gov.agency.msdr.model.v2.transfer.input.MsdrInputDxCODE;
import gov.agency.msdr.model.v2.transfer.input.MsdrInputPrCode;
import gov.agency.msdr.model.v2.transfer.output.MsdrOutputData;
import gov.agency.msdr.v420.MsdrComponent;
import java.util.ArrayList;
import java.util.List;
import java.util.Optional;

public class Main {
    public static void main(String[] args) throws FoundationException {
        //Initialize MsdrRuntimeOption
        MsdrRuntimeOption runtimeOptions = new MsdrRuntimeOption();
        //Initialize RuntimeOptions
        RuntimeOptions options = new RuntimeOptions();
        //Set the three enums on RuntimeOptions

        options.setPoaReportingExempt(MsdrHospitalStatusOptionFlag.NON_EXEMPT);
        options.setComputeAffectDrg(MsdrAffectDrgOptionFlag.COMPUTE);

        options.setMarkingLogicTieBreaker(MarkingLogicTieBreaker.CLINICAL_SIGNIFICANCE);
        //Put RuntimeOptions on the MsdrRuntimeOption map
```

```
runtimeOptions.put(MsdrOption.RUNTIME_OPTION_FLAGS, options);
//Create list of procedure codes
List<MsdrInputPrCode> procCodes = new ArrayList<>();
procCodes.add(new MsdrInputPrCode("0TY00Z0"));
procCodes.add(new MsdrInputPrCode("0FYG0Z0"));
procCodes.add(new MsdrInputPrCode("5A1D70Z"));
//Create list of secondary diagnosis codes List<MsdrInputDxCode>
sdxCodes = new ArrayList<>(); sdxCodes.add(new MsdrInputDxCode("E0800",
GfcPoa.Y));
//Set up the claim input
MsdrInput input = MsdrInput.builder()
    .withAdmissionDiagnosisCode(new MsdrInputDxCode("I120",
GfcPoa.Y))
    .withAgeDaysAdmit(0)
    .withAgeDaysDischarge(0)
    .withAgeInYears(0)

.withDischargeStatus(MsdrDischargeStatus.HOME_SELF CARE_ROUTINE)
    .withProcedureCodes(procCodes)
    .withSex(MsdrSex.MALE)
    .withPrincipalDiagnosisCode(new MsdrInputDxCode("I120",
GfcPoa.Y))
    .withSecondaryDiagnosisCodes(sdxCodes)
    .build();
//create claim and pass in input
MsdrClaim claim = new MsdrClaim(input);

//initialize component with runtime options
MsdrComponent component = new MsdrComponent(runtimeOptions);
// Process the claim through the component
component.process(claim);
// Get output
Optional<MsdrOutputData> output = claim.getOutput();

}
}
```

Support for multiple versions

This JAR contains support for versions back to 40.0. Users should remove the following versions from their classpaths:

- msdr-v411-41.1.1.0.jar
- msdr-model-v2-2.3.1.jar

and replace with the JARs specified in table 3 earlier in this document.

Users should also make the following changes to their application code:

```
// Users will need to implement their own methodology for determining
the grouper version.
int version = 420;
Processable<MsdrgrClaim, MsdrgrOption, MsdrgrRuntimeOption> component;
switch (version) {
    case 400:
        component = new
gov.agency.msdrgr.v400.MsdrgrComponent(runtimeOptions);
        break;
    case 401:
        component = new
gov.agency.msdrgr.v401.MsdrgrComponent(runtimeOptions);
        break;
    case 410:
        component = new
gov.agency.msdrgr.v410.MsdrgrComponent(runtimeOptions);
        break;
    case 411:
        component = new
gov.agency.msdrgr.v411.MsdrgrComponent(runtimeOptions);
        break;
    case 420:
        component = new
gov.agency.msdrgr.v420.MsdrgrComponent(runtimeOptions);
        break;
    default:
        throw new Exception(
            "Could not create component for version " + version);
}

// set the options on the component.
component.reconfigure(runtimeOptions);

// Process the claim through the component
component.process(claim);
```

Note: For versions older than 40.0, the following JARs should remain on the classpath:

- msdrgr-39.1.0.2.jar
- msdrgr-model-1.3.1.jar
- msdrgr-proto-generator-1.1.jar
- msdrgr-39.0.0.0.jar

- msdrg-model-1.1.0.jar
- msdrg-proto-generator-1.1.jar

Class and enum information

Class Runtime Options

Package gov.agency.msdrg.model.v2

public class RuntimeOptions

Constructors

RuntimeOptions()
RuntimeOptions(MsdrgHospitalStatusOptionFlag poaReportingExempt,
MsdrgAffectDrgOptionFlag computeAffectDrg,
MarkingLogicTieBreaker markingLogicTieBreaker)

Table 4. Method summary RuntimeOptions

Return type	Method	Description
MsdrgAffectDrgOptionFlag	getComputeAffectDrg()	Get enum value for computing if a code affects DRG
MarkingLogicTieBreaker	getMarkingLogicTieBreaker()	Get enum value for how to break ties in marking logic
MsdrgHospitalStatusOptionFlag	getPoaReportingExempt()	Get enum for hospital status on whether they are exempt from reporting POA
void	setComputeAffectDrg(MsdrgAffectDrgOptionFlag computeAffectDrg)	Set enum value whether to compute
void	setMarkingLogicTieBreaker(MarkingLogicTieBreaker markingLogicTieBreaker)	Set enum value for how to break ties in marking logic. Related to which code will get marked as effecting DRG assignment.

Return type	Method	Description
void	setPoaReportingExempt(MsdrghospitalStatusOptionFlag poaReportingExempt)	Set enum value whether the hospital is exempt from POA (present on admission) reporting

Enum MsdrgAffectDrgOptionFlag

Package gov.agency.msdrg.model.v2.enumeration

public enum MsdrgAffectDrgOptionFlag

Table 5. Enum constant Msdrg Affecting DRG Option Flag

Enum constant	Description
COMPUTE	(Default) Compute which codes affect DRG
DO_NOT_COMPUTE	Do not compute if codes affect DRG

Enum MarkingLogicTieBreaker

Package gov.agency.msdrg.model.v2.enumeration

public enum MarkingLogicTieBreaker

Table 6. Enum constant Marking Logic Tie Breaker

Enum constant	Description
CLINICAL_SIGNIFICANCE	(Default) Will use codes in clinical significance order to break ties in calculating which codes affect DRG assignment.
CODE_ORDER	Will use the order codes are entered on the claim to break ties in calculating which codes affect DRG assignment.

Enum MsdrgHospitalStatusOptionFlag

Package gov.agency.msdrg.model.v2.enumeration

public enum MsdrgHospitalStatusOptionFlag

Table 7. Enum constant Msdrgr Hospital POA Reporting Status Option Flag

Enum constant	Description
EXEMPT	Hospital is exempt from reporting POA (present on admission)
NON_EXEMPT	Hospital is not exempt from reporting POA (present on admission)
UNKNOWN	(Default) Unknown

Class MsdrgrRuntimeOption

Package gov.agency.msdrgr.model.v2

```
public class MsdrgrRuntimeOption extends
com.mmm.his.cer.foundation.ComponentRuntime<MsdrgrOption>
```

Constructor

```
MsdrgrRuntimeOption()
```

Class MsdrgrComponent

Package gov.agency.msdrgr.v420

```
public class MsdrgrComponent
```

Constructor

```
MsdrgrComponent(MsdrgrRuntimeOption options)
```

Table 8. Method summary MsdrgrComponent

Return type	Method	Description
void	close()	Close
RuntimeOptions	getOptions()	Getter for runtime options.
protected void	initialize()	Set up MSDRG component.
void	process(MsdrgrClaim claim) throws FoundationException	Process a claim.
void	reconfigure(MsdrgrRuntimeOption option)	Change the runtime options for a different claim

Class MsdrgrClaim

Package gov.agency.msdrgr.model.v2.transfer

public class MsdrgrClaim extends com.mmm.his.cer.foundation.transfer.Claim

Table 9. Method summary MsdrgrClaim

Modifier and Type	Method and Description
boolean	equals(java.lang.Object obj)
MsdrgrInputData	getInput() Return the input data as an interface.
java.util.Optional<MsdrgrOutputData>	getOutput() Get output data from this claim.
int	hashCode ()

Constructor Detail

MsdrgrClaim

```
public MsdrgrClaim(MsdrgrInput input)
```

Constructor.

Method Detail

getInput

```
public MsdrgrInputData getInput()
```

Return the input data as an interface. Once set on the claim, the input data should not be changed.

Returns:

claim input data as MsdrgrInputData

getOutput

```
public java.util.Optional<MsdrgrOutputData> getOutput()
```

Get output data from this claim. Depending on where in the lifecycle this is called, there may or may not be output data, so this returns an Optional.

Returns:

Optional object containing MsdrInputData.

setOutput

```
public void setOutput(MsdrOutput output)
```

Set the output for this claim. Since we use side effects in GFC, this is the only way to return output. However, we are only returning an interface to the output that only has getters which provides some safety.

hashCode

```
public int hashCode()
```

Overrides:

hashCode in class java.lang.Object

equals

```
public boolean equals(java.lang.Object obj)
```

Overrides:

equals in class java.lang.Object

Class MsdrInput

Package gov.agency.msdr.model.v2.transfer.input

Table 10. Method summary MsdrInput

Modifier and Type	Method and Description
static MsdrInput.MsdrInputBuilder	builder()
boolean	equals(java.lang.Object obj)
java.util.Optional<MsdrInputDxCode>	getAdmissionDiagnosisCode() Get the input admission diagnosis.
int	getAgeDaysAdmit() Get the age (in number of days) on admission.
int	getAgeDaysDischarge() Get the age (in number of days) on discharge.

Modifier and Type	Method and Description
int	getAgeInYears() Get the patient age in years.
java.util.Optional<MsdrgrDischargeStatus>	getDischargeStatus() Get the input discharge status.
java.util.Optional<MsdrgrInputDxCODE>	getPrincipalDiagnosisCode() Get the input principal diagnosis.
java.util.List<MsdrgrInputPrCODE>	getProcedureCodes() Get the input procedure codes.
java.util.List<MsdrgrInputDxCODE>	getSecondaryDiagnosisCodes() Get the input secondary diagnosis codes.
java.util.Optional<MsdrgrSex>	getSex() Get the input sex of the patient.
int	hashCode()
MsdrgrInput.MsdrgrInputBuilder	toBuilder()

Methods inherited from class java.lang.Object

getClass, notify, notifyAll, toString, wait, wait, wait

Method Detail

getAdmissionDiagnosisCode

```
public java.util.Optional<MsdrgrInputDxCODE>
getAdmissionDiagnosisCode()
```

Description copied from interface: MsdrgrInputData

Get the input admission diagnosis.

Specified by:

getAdmissionDiagnosisCode in interface MsdrgrInputData

Returns:

an Optional containing a MsdrgrInputDxCODE.

getPrincipalDiagnosisCode

```
public java.util.Optional<MsdrInputDxCode>  
getPrincipalDiagnosisCode()
```

Description copied from interface: MsdrInputData

Get the input principal diagnosis.

Specified by:

getPrincipalDiagnosisCode in interface MsdrInputData

Returns:

an Optional containing a MsdrInputDxCode.

getAgeInYears

```
public int getAgeInYears()
```

Description copied from interface: MsdrInputData

Get the patient age in years.

Specified by:

getAgeInYears in interface MsdrInputData

Returns:

an integer representing the age.

getDischargeStatus

```
public java.util.Optional<MsdrDischargeStatus> getDischargeStatus()
```

Description copied from interface: MsdrInputData

Get the input discharge status..

Specified by:

getDischargeStatus in interface MsdrInputData

Returns:

an Optional containing a MsdrDischargeStatus.

getAgeDaysAdmit

```
public int getAgeDaysAdmit()
```

Description copied from interface: MsdrInputData

Get the age (in number of days) on admission.

Specified by:

getAgeDaysAdmit in interface MsdrInputData

Returns:

an integer representing the age in days.

getAgeDaysDischarge

```
public int getAgeDaysDischarge()
```

Description copied from interface: MsdrInputData

Get the age (in number of days) on discharge.

Specified by:

getAgeDaysDischarge in interface MsdrInputData

Returns:

an integer representing the age in days.

getSex

```
public java.util.Optional<MsdrSex> getSex()
```

Description copied from interface: MsdrInputData

Get the input sex of the patient.

Specified by:

getSex in interface MsdrInputData

Returns:

an Optional containing a MsdrSex.

getSecondaryDiagnosisCodes

```
public java.util.List<MsdrInputDxCode> getSecondaryDiagnosisCodes()
```

Description copied from interface: MsdrInputData

Get the input secondary diagnosis codes.

Specified by:

getSecondaryDiagnosisCodes in interface MsdrInputData

Returns:

a List containing a MsdrInputDxCode.

getProcedureCodes

```
public java.util.List<MsdrInputPrCode> getProcedureCodes()
```

Description copied from interface: MsdrInputData

Get the input procedure codes.

Specified by:

getProcedureCodes in interface MsdrInputData

Returns:

a List containing a MsdrInputPrCode.

builder

```
public static MsdrInput.MsdrInputBuilder builder()
```

toBuilder

```
public MsdrInput.MsdrInputBuilder toBuilder()
```

Specified by:

toBuilder in interface DataBuilder<MsdrInput.MsdrInputBuilder>

hashCode

```
public int hashCode()
```

Overrides:

hashCode in class java.lang.Object

equals

```
public boolean equals(java.lang.Object obj)
```

Overrides:

equals in class java.lang.Object

Class MsdrInputBuilder

Package gov.agency.msdrg.model.v2.transfer.input

```
public static final class MsdrInput.MsdrInputBuilder
```

```
extends java.lang.Object
```

Builder for MsdrInput.

Table 11. Method Summary MsdrInputBuilder

Modifier and Type	Method and Description
MsdrInput	build() Build a new instance.
MsdrInput.MsdrInputBuilder	withAdmissionDiagnosisCode(MsdrInputDxCode admissionDiagnosisCode)
MsdrInput.MsdrInputBuilder	withAgeDaysAdmit(int ageDaysAdmit)
MsdrInput.MsdrInputBuilder	withAgeDaysDischarge(int ageDaysDischarge)
MsdrInput.MsdrInputBuilder	withAgeInYears(int ageInYears)
MsdrInput.MsdrInputBuilder	withDischargeStatus(MsdrDischargeStatus dischargeStatus)
MsdrInput.MsdrInputBuilder	withPrincipalDiagnosisCode(MsdrInputDxCode principalDiagnosisCode)
MsdrInput.MsdrInputBuilder	withProcedureCodes(java.util.List<MsdrInputProcedure> procedureCodes)
MsdrInput.MsdrInputBuilder	withSecondaryDiagnosisCodes(java.util.List<MsdrInputDxCode> secondaryDiagnosisCodes)
MsdrInput.MsdrInputBuilder	withSex(MsdrSex sex)

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

*Method Detail***withAdmissionDiagnosisCode**

```
public MsdrInput.MsdrInputBuilder
withAdmissionDiagnosisCode(MsdrInputDxCode admissionDiagnosisCode)
```

withPrincipalDiagnosisCode

```
public MsdrInput.MsdrInputBuilder
withPrincipalDiagnosisCode(MsdrInputDxCode principalDiagnosisCode)
```

withAgeInYears

```
public MsdrInput.MsdrInputBuilder withAgeInYears(int ageInYears)
```

withDischargeStatus

```
public MsdrInput.MsdrInputBuilder
withDischargeStatus(MsdrDischargeStatus dischargeStatus)
```

withAgeDaysAdmit

```
public MsdrInput.MsdrInputBuilder withAgeDaysAdmit(int ageDaysAdmit)
```

withAgeDaysDischarge

```
public MsdrInput.MsdrInputBuilder withAgeDaysDischarge(int
ageDaysDischarge)
```

withSex

```
public MsdrInput.MsdrInputBuilder withSex(MsdrSex sex)
```

withSecondaryDiagnosisCodes

```
public MsdrInput.MsdrInputBuilder
withSecondaryDiagnosisCodes(java.util.List<MsdrInputDxCode>
secondaryDiagnosisCodes)
```

withProcedureCodes

```
public MsdrInput.MsdrInputBuilder
withProcedureCodes(java.util.List<MsdrInputPrCode> procedureCodes)
```

build

```
public MsdrInput build()
```

Build a new instance.

Returns:

new instance of MsdrInput.

Class MsdrOutput

Package gov.agency.msdr.model.v2.transfer.output

```
public class MsdrOutput
```

Table 12. Method summary MsdrOutput

Modifier and Type	Method and Description
static MsdrOutput.MsdrOutputBuilder	static MsdrOutput.MsdrOutputBuilder
boolean	equals(java.lang.Object obj)

Modifier and Type	Method and Description
MsdrgValue<java.lang.Integer>	getFinalBaseDrg() Get the base diagnosis related group for the final grouping.
MsdrgValue<java.lang.Integer>	getFinalDrg() Get the diagnosis related group for the final grouping.
MsdrgSeverity	getFinalDrgSdxSeverity() Get the Final DRG secondary diagnosis severity.
MsdrgGrouperReturnCode	getFinalGrc() Get the grouper return code for the final grouping.
MsdrgValue<java.lang.Integer>	getFinalMdc() Get the major diagnostic category for the final grouping.
MsdrgMedSurgType	getFinalMedSurgType() Get the MsdrgMedSurgType for initial grouping.
MsdrgSeverity	getFinalSeverity() The final claim severity.
MsdrgGrouperFlags	getGrouperFlags() Get the grouper flags used during processing.
MsdrgHacStatus	getHacStatus() Get the HAC status.
MsdrgValue<java.lang.Integer>	getInitialBaseDrg() Get the base diagnosis related group for the initial grouping.
MsdrgValue<java.lang.Integer>	getInitialDrg() Get the diagnosis related group for the initial grouping.
MsdrgSeverity	getInitialDrgSdxSeverity() Get the Initial DRG secondary diagnosis severity.

Modifier and Type	Method and Description
MsdrgGrouperReturnCode	getInitialGrc() Get the grouper return code for the initial grouping.
MsdrgValue<java.lang.Integer>	getInitialMdc() Get the major diagnostic category for the initial grouping.
MsdrgMedSurgType	getInitialMedSurgType() Get the MsdrgMedSurgType for initial grouping.
MsdrgSeverity	getInitialSeverity() The initial claim severity.
int	getNumHacCategoriesSatisfied() Get the number of distinct HAC categories that were satisfied.
MsdrgOutputDxCode	getPdxOutput() Get principal diagnosis output.
java.util.List<MsdrgOutputPrCode>	getProcOutput() Get all procedure output as a list.
MsdrgOutputPrCode	getProcOutput(int procCodeIndex) Get procedure output by index, starting at 0 for the first pr
java.util.List<MsdrgOutputDxCode>	getSdxOutput() Get all secondary diagnosis output as a list.
MsdrgOutputDxCode	getSdxOutput(int sdxCodeIndex) Get secondary diagnosis output by index, starting at 0 for the first se
int	hashCode()
MsdrgOutput.MsdrgOutputBuilder	toBuilder()

Methods inherited from class *java.lang.Object*

getClass, notify, notifyAll, toString, wait, wait, wait

Method Detail

getGrouperFlags

```
public MsdrGrouperFlags getGrouperFlags()
```

Description copied from interface: MsdrGOutputData

Get the grouper flags used during processing.

Specified by:

getGrouperFlags in interface MsdrGOutputData

Returns:

an MsdrGrouperFlags object.

getInitialGrc

```
public MsdrGrouperReturnCode getInitialGrc()
```

Description copied from interface: MsdrGOutputData

Get the grouper return code for the initial grouping.

Specified by:

getInitialGrc in interface MsdrGOutputData

Returns:

a MsdrGrouperReturnCode

getInitialMdc

```
public MsdrGValue<java.lang.Integer> getInitialMdc()
```

Description copied from interface: MsdrGOutputData

Get the major diagnostic category for the initial grouping.

Specified by:

getInitialMdc in interface MsdrGOutputData

Returns:

a MsdrGValue representing the major diagnostic category and description.

getInitialDrg

```
public MsdrtheValue<java.lang.Integer> getInitialDrg()
```

Description copied from interface: MsdrOutputData

Get the diagnosis related group for the initial grouping.

Specified by:

getInitialDrg in interface MsdrOutputData

Returns:

a MsdrValue representing the diagnosis related group and description.

getInitialMedSurgType

```
public MsdrMedSurgType getInitialMedSurgType()
```

Description copied from interface: MsdrOutputData

Get the MsdrMedSurgType for initial grouping.

Specified by:

getInitialMedSurgType in interface MsdrOutputData

Returns:

an enum representing the type.

getInitialBaseDrg

```
public MsdrValue<java.lang.Integer> getInitialBaseDrg()
```

Description copied from interface: MsdrOutputData

Get the base diagnosis related group for the initial grouping.

Specified by:

getInitialBaseDrg in interface MsdrOutputData

Returns:

a MsdrValue representing the base diagnosis related group and description.

getFinalGrc

```
public MsdrGrouperReturnCode getFinalGrc()
```

Description copied from interface: MsdrOutputData

Get the grouper return code for the final grouping.

Specified by:

getFinalGrc in interface MsdrOutputData

Returns:

a MsdrGrouperReturnCode

getFinalMdc

```
public MsdrValue<java.lang.Integer> getFinalMdc()
```

Description copied from interface: MsdrOutputData

Get the major diagnostic category for the final grouping.

Specified by:

getFinalMdc in interface MsdrOutputData

Returns:

a MsdrValue representing the major diagnostic category and description.

getFinalDrg

```
public MsdrValue<java.lang.Integer> getFinalDrg()
```

Description copied from interface: MsdrOutputData

Get the diagnosis related group for the final grouping.

Specified by:

getFinalDrg in interface MsdrOutputData

Returns:

a MsdrValue representing the diagnosis related group and description.

getFinalMedSurgType

```
public MsdrMedSurgType getFinalMedSurgType()
```

Description copied from interface: MsdrOutputData

Get the MsdrMedSurgType for initial grouping.

Specified by:

getFinalMedSurgType in interface MsdrOutputData

Returns:

an enum representing the type.

getPdxOutput

```
public MsdrOutputDxCode getPdxOutput()
```

Description copied from interface: MsdrOutputData

Get principal diagnosis output.

Specified by:

getPdxOutput in interface MsdrOutputData

Returns:

an instance of MsdrOutputDxCode that contains all output for the principal diagnosis.

getFinalBaseDrg

```
public MsdrValue<java.lang.Integer> getFinalBaseDrg()
```

Description copied from interface: MsdrOutputData

Get the base diagnosis related group for the final grouping.

Specified by:

getFinalBaseDrg in interface MsdrOutputData

Returns:

a MsdrValue representing the base diagnosis related group and description.

getFinalDrgSdxSeverity

```
public MsdrSeverity getFinalDrgSdxSeverity()
```

Description copied from interface: MsdrOutputData

Get the Final DRG secondary diagnosis severity.

Specified by:

getFinalDrgSdxSeverity in interface MsdrOutputData

Returns:

a MsdrSeverity

getInitialDrgSdxSeverity

```
public MsdrSeverity getInitialDrgSdxSeverity()
```

Description copied from interface: MsdrOutputData

Get the Initial DRG secondary diagnosis severity.

Specified by:

getInitialDrgSdxSeverity in interface MsdrOutputData

Returns:

a MsdrSeverity

getNumHacCategoriesSatisfied

```
public int getNumHacCategoriesSatisfied()
```

Description copied from interface: MsdrOutputData

Get the number of distinct HAC categories that were satisfied.

Specified by:

getNumHacCategoriesSatisfied in interface MsdrOutputData

Returns:

int representing the number of HAC categories.

getHacStatus

```
public MsdrHacStatus getHacStatus()
```

Description copied from interface: MsdrOutputData

Get the HAC status.

Specified by:

getHacStatus in interface MsdrOutputData

Returns:

a MsdrHacStatus

getSdxOutput

```
public java.util.List<MsdrOutputDxCode> getSdxOutput()
```

Description copied from interface: MsdrOutputData

Get all secondary diagnosis output as a list. NOTE: if a null is passed as part of the input secondary diagnosis list, the grouper will process it with "NULL" as the code and N as the poa. This will result in a MsdrOutputDxCode being created even for null input.

Specified by:

getSdxOutput in interface MsdrOutputData

Returns:

an UNMODIFIABLE collection of MsdrOutputDxCodes that represents all secondary diagnosis output. The order of the output in the returned list will match the order of the codes in the input secondary diagnosis list.

getSdxOutput

```
public MsdrOutputDxCodes getSdxOutput(int sdxCodeIndex)
```

throws com.mmm.his.cer.foundation.exception.FoundationException

Description copied from interface: MsdrOutputData

Get secondary diagnosis output by index, starting at 0 for the first secondary diagnosis code. NOTE: if a null is passed as part of the input secondary diagnosis list, the grouper will process it with "NULL" as the code and N as the poa. This will result in a MsdrOutputDxCodes being created even for null input.

Specified by:

getSdxOutput in interface MsdrOutputData

Parameters:

sdxCodeIndex - the index of the secondary diagnosis code as it appeared in the input list.

Returns:

a MsdrOutputDxCodes if there was output at the provided index.

Throws:

com.mmm.his.cer.foundation.exception.FoundationException - if the index provided causes an error trying to get output.

getProcOutput

```
public java.util.List<MsdrOutputPrCode> getProcOutput()
```

Description copied from interface: MsdrOutputData

Get all procedure output as a list. NOTE: if a null is passed as part of the input procedure list, the grouper will process it with "NULL" as the code. This will result in a MsdrOutputPrCode being created even for null input.

Specified by:

getProcOutput in interface MsdrOutputData

Returns:

an UNMODIFIABLE collection of MsdrOutputPrCodes that represents all procedure output. The order of the output in the returned list will match the order of the codes in the input procedure list.

getProcOutput

```
public MsdrOutputPrCode getProcOutput(int procCodeIndex)
```

throws com.mmm.his.cer.foundation.exception.FoundationException

Description copied from interface: MsdrOutputData

Get procedure output by index, starting at 0 for the first procedure code. NOTE: if a null is passed as part of the input procedure list, the grouper will process it with "NULL" as the code. This will result in a MsdrOutputPrCode being created even for null input.

Specified by:

getProcOutput in interface MsdrOutputData

Parameters:

procCodeIndex - the index of the procedure code as it appeared in the input list.

Returns:

a MsdrOutputDxCode if there was output at the provided index.

Throws:

com.mmm.his.cer.foundation.exception.FoundationException - if the index provided causes an error trying to get output.

getFinalSeverity

```
public MsdrSeverity getFinalSeverity()
```

Description copied from interface: MsdrOutputData

The final claim severity.

Specified by:

getFinalSeverity in interface MsdrOutputData

Returns:

a MsdrSeverity.

getInitialSeverity

```
public MsdrSeverity getInitialSeverity()
```

Description copied from interface: MsdrOutputData

The initial claim severity.

Specified by:

getInitialSeverity in interface MsdrOutputData

Returns:

a MsdrSeverity.

builder

```
public static MsdrOutput.MsdrOutputBuilder builder()
```

toBuilder

```
public MsdrOutput.MsdrOutputBuilder toBuilder()
```

equals

```
public boolean equals(java.lang.Object obj)
```

Overrides:

equals in class java.lang.Object

hashCode

```
public int hashCode()
```

Overrides:

hashCode in class java.lang.Object

Enum MsdrHacStatus

Package gov.agency.msdr.model.v2.enumeration

```
public enum MsdrHacStatus
```

Table 13. Enum constant Msdr Hospital Acquired Condition Status

Enum constant	Description
NOT_ON_HAC_LIST	Diagnosis code is not on a HAC list
HAC_CRITERIA_MET	HAC's formula has been met

Enum constant	Description
HAC_CRITERIA_NOT_MET	HAC's formula has not been met
HAC_NOT_APPLICABLE_EXCLUSION	HAC's not applicable because the code is an exclusion
HAC_NOT_APPLICABLE_EXEMPT	HAC not applicable due to hospital exemption

Enum MsdrCodeSeverityFlag

Package gov.agency.msdr.model.v2.enumeration

public enum MsdrCodeSeverityFlag

Table 14. Enum constant Msdr Code Severity Flag

Enum constant	Description
MCC	Code was a MCC
CC	Code was a CC
MCC_EXCLUDED_BY_DRG_LOGIC	Code was a MCC but ignored due to exclusion by DRG logic
CC_EXCLUDED_BY_DRG_LOGIC	Code was a CC but ignore due to exclusion by DRG logic
MCC_EXCLUDED	Code was a MCC but ignored due to exclusions
CC_EXCLUDED	Code was a CC but ignored due to exclusions
NEITHER	Code was NCC

Enum MsdrPoaErrorCode

Package gov.agency.msdr.model.v2.enumeration

public enum MsdrPoaErrorCode

Table 15. Enum constant Msdrgr Present On Admission Error Code

Enum constant	Description
POA_NOT_CHECKED	POA not checked
POA_NOT_RECOGNIZED	POA is not recognized
POA_RECOGNIZED_NOT_POA	POA is a valid value meaning "NO"
POA_RECOGNIZED_YES_POA	POA is a valid value meaning "YES"
HOSPITAL_EXEMPT	Hospital is exempt from reporting POA
BLANK_DX_NOT_CONSIDERED	Diagnosis code not considered

Enum MsdrgrGroupingImpact

Package gov.agency.msdrgr.model.v2.enumeration

public enum MsdrgrGroupingImpact

Table 16. Enum constant Msdrgr Grouping Impact

Enum constant	Description
INITIAL	Code impacted DRG assignment only in initial grouping
FINAL	Code impacted DRG assignment only in final grouping
BOTH	Code impacted DRG assignment in both initial and final grouping
NONE	Code did not impact DRG assignment

Enum GfcPOA

Package com.mmm.his.cer.foundation.model

public enum GfcPoa

Table 17. Enum constant Gfc Present on Admission

Enum constant	Description
Y	Yes

Enum constant	Description
N	No
U	Insufficient documentation to determine if present on admission
W	Clinically unable to determine a time of admission
ONE	Exempt from POA reporting/Unreported/ Not used
E	Exempt from POA reporting/ Unreported/Not used
BLANK	Exempt from POA reporting/ Unreported/Not used
INVALID	Invalid

Enum MsdrdSex

Package gov.agency.msdrd.model.v2.enumeration

public enum MsdrdSex

Table 18. Enum constant MsdrdSex

Enum constant	Description
UNKNOWN	Unknown
MALE	Male
FEMALE	Female

Enum MsdrdMedSurgType

Package gov.agency.msdrd.model.v2.enumeration

public enum MsdrdMedSurgType

Table 19. Enum constant Msdrd Medical Surgical Type

Enum constant	Description
MEDICAL	DRG is Medical
NONE	DRG is neither
SURGICAL	DRG is Surgical

Enum MsdrSeverity

Package gov.agency.msdr.model.v2.enumeration

public enum MsdrSeverity

Table 20. Enum constant Msdr Severity

Enum constant	Description
CC	Complication or comorbidity
MCC	Major complications or comorbidities
NON_CC	No complications or comorbidities

Enum MsdrGrouperFlagHacStatus

Package gov.agency.msdr.model.v2.enumeration

Table 21. Enum constant Msdr Grouper Flag Hospital Acquired Condition Status

Enum constant	Description
FINAL_DRG_CHANGES	Final DRG changes after processing HACs(hospital acquired conditions) (HAC processing only occurs during final grouping)
FINAL_DRG_NO_CHANGE	No change between initial and final grouping due to HACs
FINAL_DRG_UNGROUPABLE	When processing HAC's the claim is ungroupable
NOT_APPLICABLE	N/A

Enum MsdrAdmitDxGrouperFlag

Package gov.agency.msdr.model.v2.enumeration

Table 22. Enum constant Msdr Admit Diagnosis Grouper Flag

Enum constant	Description
DX_INVALID	Admission diagnosis is invalid
DX_NOT_GIVEN	No admission diagnosis on claim
DX_VALID	Admission diagnosis is valid

Enum MsdrGrouperReturnCode

Package gov.agency.msdr.model.v2.enumeration

Table 23. Enum constant MsdrGrouper Return Code

Enum constant	Description
DX_CANNOT_BE_PDX	Grouping stopped due to invalid principal diagnosis
HAC_MISSING_ONE_POA	HAC processing stopped due to a missing POA value
HAC_STATUS_INVALID_MULT_HA CS_POA_NOT_Y_W	Hospital Status is invalid or missing and there are multiple HACs that have different HAC POA values that are not Y or W
HAC_STATUS_INVALID_POA_INVA LID_OR_1	Hospital Status is invalid or missing and at least one POA is invalid or missing or 1
HAC_STATUS_INVALID_POA_N_O R_U	Hospital Status is invalid or missing and at least one POA is N or U
INVALID_DISCHARGE_STATUS	Invalid discharge status
INVALID_PDX	Invalid principal diagnosis
INVALID_SEX	Invalid sex
OK	DRG successfully assigned

Enum MsdrGDischargeStatus

Package gov.agency.msdr.model.v2.enumeration

public enum MsdrGDischargeStatus

Enum constant

CANC_CHILD_HOSP
 CANC_CHILD_HOSP_W_PLANNED_READMISSION
 COURT_LAW_ENFRC
 COURT_LAW_ENFRC_W_PLANNED_READMISSION
 CRIT_ACC_HOSP
 CRIT_ACC_HOSP_W_PLANNED_READMISSION
 CUST_SUPP_CARE
 CUST_SUPP_CARE_W_PLANNED_READMISSION
 DESIGNATED_DISASTER_ALTERNATIVE_CARE_SITE

DIED
 FEDERAL_HOSPITAL
 FEDERAL_HOSPITAL_W_PLANNED_READMISSION
 HOME_HEALTH_SERVICE
 HOME_HEALTH_SERVICE_W_PLANNED_READMISSION
 HOME_SELF_CARE_W_PLANNED_READMISSION
 HOME_SELF_CARE_ROUTINE
 HOSPICE_HOME
 HOSPICE_MEDICAL_FACILITY
 LEFT_AGAINST_MEDICAL_ADVICE
 LONG_TERM_CARE_HOSPITAL
 LTCH_W_PLANNED_READMISSION
 NONE
 NURSG_FAC_MEDICAID_CERT_W_PLANNED_READMISSION
 NURSING_FACILITY_MEDICAID_CERTIFIED
 OTH_INSTITUTION
 OTH_INSTITUTION_W_PLANNED_READMISSION
 PSYCH_HOSP_UNIT
 PSYCH_HOSP_UNIT_W_PLANNED_READMISSION
 REHAB_FACILITY_REHAB_UNIT
 REHAB_FACILITY_UNIT_W_PLANNED_READMISSION
 SHORT_TERM_HOSPITAL
 SHORT_TERM_HOSPITAL_W_PLANNED_READMISSION
 SNF
 SNF_W_PLANNED_READMISSION
 STILL_A_PATIENT
 SWING_BED
 SWING_BED_W_PLANNED_READMISSION

Class MsdrgInputDxCode

Package gov.agency.msdrg.model.v2.transfer.input

```
public class MsdrgInputDxCode
extends java.lang.Object
```

Immutable class for DX input codes.

Constructor and Description

MsdrgInputDxCode(java.lang.String value, com.mmm.his.cer.foundation.model.GfcPoa poa)

Table 24. Method summary MsdrgDiagnosisCode

Modifier and Type	Method and Description
boolean	equals(java.lang.Object obj)

Modifier and Type	Method and Description
com.mmm.his.cer.foundation.model.GfcPoa	getPoa()
java.lang.String	getValue()
int	hashCode ()

Methods inherited from class java.lang.Object

getClass, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

MsdrgInputDxCode

```
public MsdrgInputDxCode(java.lang.String value,  
com.mmm.his.cer.foundation.model.GfcPoa poa)
```

Method Detail

getValue

```
public java.lang.String getValue()
```

getPoa

```
public com.mmm.his.cer.foundation.model.GfcPoa getPoa()
```

equals

```
public boolean equals(java.lang.Object obj)
```

Overrides:

equals in class java.lang.Object

hashCode

```
public int hashCode()
```

Overrides:

hashCode in class java.lang.Object

Class MsdrInputPrCode

```
public class MsdrInputPrCode
extends java.lang.Object
```

Immutable class for PR input codes.

Constructor and Description

```
MsdrInputPrCode(java.lang.String value)
```

Table 25. Method summary MsdrProcedureCode

Modifier and Type	Method and Description
boolean	equals(java.lang.Object o)
java.lang.String	getValue()
int	hashCode()

Methods inherited from class java.lang.Object

getClass, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

MsdrInputPrCode

```
public MsdrInputPrCode(java.lang.String value)
```

Method Detail

getValue

```
public java.lang.String getValue()
```

equals

```
public boolean equals(java.lang.Object o)
```

Overrides:

equals in class java.lang.Object

hashCode

```
public int hashCode()
```

Overrides:

hashCode in class java.lang.Object

Class MsdrOutputDxCode

gov.agency.msdr.model.v2.transfer.MsdrOutputDxCode

```
public class MsdrOutputDxCode
extends java.lang.Object
```

Container class that wraps all data regarding the output for a diagnosis code.

Constructor and Description

MsdrOutputDxCode(MsdrInputDxCode inputDxCode, MsdrDiagnosisFlag flags)

Table 26. Method Summary Class MsdrOutputDxCode

Modifier and Type	Method and Description
boolean	equals(java.lang.Object obj)
MsdrGroupingImpact	getDiagnosisAffectsDrg()
MsdrCodeSeverityFlag	getFinalSeverityUsage()
java.util.List<MsdrHac>	getHacs()
MsdrCodeSeverityFlag	getInitialSeverityUsage()
MsdrInputDxCode	getInputDxCode()
java.lang.String	getLegacyFlagString()
MsdrPoaErrorCode	getPoaErrorCode()
int	hashCode()
boolean	isDiagnosisRecognizedByGrouper()

Methods inherited from class java.lang.Object

getClass, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

```
public MsdrOutputDxCode(MsdrInputDxCode inputDxCode,
                        MsdrDiagnosisFlag flags)
```

Method Detail

getInputDxCode

```
public MsdrglInputDxCode getInputDxCode()
```

isDiagnosisRecognizedByGrouper

```
public boolean isDiagnosisRecognizedByGrouper()
```

getDiagnosisAffectsDrg

```
public MsdrgGroupingImpact getDiagnosisAffectsDrg()
```

getFinalSeverityUsage

```
public MsdrgCodeSeverityFlag getFinalSeverityUsage()
```

getInitialSeverityUsage

```
public MsdrgCodeSeverityFlag getInitialSeverityUsage()
```

getPoaErrorCode

```
public MsdrgPoaErrorCode getPoaErrorCode()
```

getHacs

```
public java.util.List<MsdrgHac> getHacs()
```

getLegacyFlagString

```
public java.lang.String getLegacyFlagString()
```

equals

```
public boolean equals(java.lang.Object obj)
```

Overrides:

equals in class java.lang.Object

hashCode

```
public int hashCode()
```

Overrides:

hashCode in class java.lang.Object

Class MsdrOutputPrCode

gov.agency.msdr.model.v2.transfer.output.MsdrOutputPrCode

```
public class MsdrOutputPrCode
extends java.lang.Object
```

Container class that wraps all data regarding the output for a procedure code.

Constructor and Description

MsdrOutputPrCode(MsdrInputPrCode inputPrCode, MsdrProcedureFlag flags)

Table 27. Method Summary Class MsdrOutputPrCode

Modifier and Type	Method and Description
boolean	equals(java.lang.Object o)
java.util.Set<MsdrProcedureHacUsage>	getHacUsage()
MsdrInputPrCode	getInputPrCode()
java.lang.String	getLegacyFlagString()
MsdrGroupingImpact	getProcedureAffectsDrg()
int	hashCode()
boolean	isProcedureIsOperatingRoomProcedure()
boolean	isProcedureRecognizedByGrouper()

Methods inherited from class java.lang.Object

getClass, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

MsdrgOutputPrCode

```
public MsdrgOutputPrCode(MsdrgInputPrCode inputPrCode,  
                        MsdrgProcedureFlag flags)
```

Method Detail

getInputPrCode

```
public MsdrgInputPrCode getInputPrCode()
```

isProcedureRecognizedByGrouper

```
public boolean isProcedureRecognizedByGrouper()
```

getProcedureAffectsDrg

```
public MsdrgGroupingImpact getProcedureAffectsDrg()
```

isProcedureIsOperatingRoomProcedure

```
public boolean isProcedureIsOperatingRoomProcedure()
```

getHacUsage

```
public java.util.Set<MsdrgProcedureHacUsage> getHacUsage()
```

getLegacyFlagString

```
public java.lang.String getLegacyFlagString()
```

equals

```
public boolean equals(java.lang.Object o)
```

Overrides:

equals in class java.lang.Object

hashCode

```
public int hashCode()
```

Overrides:

hashCode in class java.lang.Object

Interface MsdrOutputData

public interface MsdrOutputData

Output data interface.

Table 28. Method Summary Interface MsdrOutputData

Modifier and Type	Method and Description
MsdrValue<java.lang.Integer>	getFinalBaseDrg() Get the base diagnosis related group for the final grouping.
MsdrValue<java.lang.Integer>	getFinalDrg() Get the diagnosis related group for the final grouping.
MsdrSeverity	getFinalDrgSdxSeverity() Get the Final DRG secondary diagnosis severity.
MsdrGrouperReturnCode	getFinalGrc() Get the grouper return code for the final grouping.
MsdrValue<java.lang.Integer>	getFinalMdc() Get the major diagnostic category for the final grouping.
MsdrMedSurgType	getFinalMedSurgType() Get the MsdrMedSurgType for initial grouping.
MsdrSeverity	getFinalSeverity() The final claim severity.
MsdrGrouperFlags	getGrouperFlags() Get the grouper flags used during processing.
MsdrHacStatus	getHacStatus() Get the HAC status.
MsdrValue<java.lang.Integer>	getInitialBaseDrg() Get the base diagnosis related group for the initial grouping.

Modifier and Type	Method and Description
MsdrgValue<java.lang.Integer>	getInitialDrg() Get the diagnosis related group for the initial grouping.
MsdrgSeverity	getInitialDrgSdxSeverity() Get the Initial DRG secondary diagnosis severity.
MsdrgGrouperReturnCode	getInitialGrc() Get the grouper return code for the initial grouping.
MsdrgValue<java.lang.Integer>	getInitialMdc() Get the major diagnostic category for the initial grouping.
MsdrgMedSurgType	getInitialMedSurgType() Get the MsdrgMedSurgType for initial grouping.
MsdrgSeverity	getInitialSeverity() The initial claim severity.
int	getNumHacCategoriesSatisfied() Get the number of distinct HAC categories that were satisfied.
MsdrgOutputDxCode	getPdxOutput() Get principal diagnosis output.
java.util.List<MsdrgOutputPrCode>	getProcOutput() Get all procedure output as a list.
MsdrgOutputPrCode	getProcOutput(int procCodeIndex) Get procedure output by index, starting at 0 for the first procedure code.
java.util.List<MsdrgOutputDxCode>	getSdxOutput() Get all secondary diagnosis output as a list.
MsdrgOutputDxCode	getSdxOutput(int sdxCodeIndex) Get secondary diagnosis output by index, starting at 0 for the first secondary diagnosis code.

Method Detail

getGrouperFlags

```
MsdrgGrouperFlags getGrouperFlags()
```

Get the grouper flags used during processing.

Returns:

an MsdrgGrouperFlags object.

getInitialGrc

```
MsdrgGrouperReturnCode getInitialGrc()
```

Get the grouper return code for the initial grouping.

Returns:

a MsdrgGrouperReturnCode

getInitialMdc

```
MsdrgValue<java.lang.Integer> getInitialMdc()
```

Get the major diagnostic category for the initial grouping.

Returns:

a MsdrgValue representing the major diagnostic category and description.

getInitialDrg

```
MsdrgValue<java.lang.Integer> getInitialDrg()
```

Get the diagnosis related group for the initial grouping.

Returns:

a MsdrgValue representing the diagnosis related group and description.

getInitialMedSugType

```
MsdrgMedSurgType getInitialMedSurgType()
```

Get the MsdrgMedSurgType for initial grouping.

Returns:

an enum representing the type.

getInitialBaseDrg

```
MsdrgValue<java.lang.Integer> getInitialBaseDrg()
```

Get the base diagnosis related group for the initial grouping.

Returns:

a MsdrgrValue representing the base diagnosis related group and description.

getFinalGrc

```
MsdrgrGrouperReturnCode getFinalGrc()
```

Get the grouper return code for the final grouping.

Returns:

a MsdrgrGrouperReturnCode

getFinalMdc

```
MsdrgrValue<java.lang.Integer> getFinalMdc()
```

Get the major diagnostic category for the final grouping.

Returns:

a MsdrgrValue representing the major diagnostic category and description.

getFinalDrg

```
MsdrgrValue<java.lang.Integer> getFinalDrg()
```

Get the diagnosis related group for the final grouping.

Returns:

a MsdrgrValue representing the diagnosis related group and description.

getFinalMedSurgType

```
MsdrgrMedSurgType getFinalMedSurgType()
```

Get the MsdrgrMedSurgType for initial grouping.

Returns:

an enum representing the type.

getFinalBaseDrg

```
MsdrgrValue<java.lang.Integer> getFinalBaseDrg()
```

Get the base diagnosis related group for the final grouping.

Returns:

a MsdrgrValue representing the base diagnosis related group and description.

getFinalDrgSdxSeverity

```
MsdrgSeverity getFinalDrgSdxSeverity()
```

Get the Final DRG secondary diagnosis severity.

Returns:

a MsdrgSeverity

getInitialDrgSdxSeverity

```
MsdrgSeverity getInitialDrgSdxSeverity()
```

Get the Initial DRG secondary diagnosis severity.

Returns:

a MsdrgSeverity

getNumHacCategoriesSatisfied

```
int getNumHacCategoriesSatisfied()
```

Get the number of distinct HAC categories that were satisfied.

Returns:

int representing the number of HAC categories.

getHacStatus

```
MsdrgHacStatus getHacStatus()
```

Get the HAC status.

Returns:

a MsdrgHacStatus

getPdxOutput

```
MsdrgOutputDxCode getPdxOutput()
```

Get principal diagnosis output.

Returns:

an instance of MsdrgOutputDxCode that contains all output for the principal diagnosis.

getSdxOutput

```
java.util.List<MsdrOutputDxCode> getSdxOutput()
```

Get all secondary diagnosis output as a list. NOTE: if a null is passed as part of the input secondary diagnosis list, the grouper will process it with "NULL" as the code and N as the poa. This will result in a MsdrOutputDxCode being created even for null input.

Returns:

an UNMODIFIABLE collection of MsdrOutputDxCodes that represents all secondary diagnosis output. The order of the output in the returned list will match the order of the codes in the input secondary diagnosis list.

getSdxOutput

```
MsdrOutputDxCode getSdxOutput(int sdxCodeIndex)
```

throws com.mmm.his.cer.foundation.exception.FoundationException

Get secondary diagnosis output by index, starting at 0 for the first secondary diagnosis code. NOTE: if a null is passed as part of the input secondary diagnosis list, the grouper will process it with "NULL" as the code and N as the poa. This will result in a MsdrOutputDxCode being created even for null input.

Parameters:

sdxCodeIndex - the index of the secondary diagnosis code as it appeared in the input list.

Returns:

a MsdrOutputDxCode if there was output at the provided index.

Throws:

com.mmm.his.cer.foundation.exception.FoundationException - if the index provided causes an error trying to get output.

getProcOutput

```
java.util.List<MsdrOutputPrCode> getProcOutput()
```

Get all procedure output as a list. NOTE: if a null is passed as part of the input procedure list, the grouper will process it with "NULL" as the code. This will result in a MsdrOutputPrCode being created even for null input.

Returns:

an UNMODIFIABLE collection of MsdrOutputPrCodes that represents all procedure output. The order of the output in the returned list will match the order of the codes in the input procedure list.

getProcOutput

```
MsdrgOutputPrCode getProcOutput(int procCodeIndex)
```

throws `com.mmm.his.cer.foundation.exception.FoundationException`

Get procedure output by index, starting at 0 for the first procedure code. NOTE: if a null is passed as part of the input procedure list, the grouper will process it with "NULL" as the code. This will result in a `MsdrgOutputPrCode` being created even for null input.

Parameters:

`procCodeIndex` - the index of the procedure code as it appeared in the input list.

Returns:

a `MsdrgOutputDxCode` if there was output at the provided index.

Throws:

`com.mmm.his.cer.foundation.exception.FoundationException` - if the index provided causes an error trying to get output.

getFinalSeverity

```
MsdrgSeverity getFinalSeverity()
```

The final claim severity.

Returns:

a `MsdrgSeverity`.

getInitialSeverity

```
MsdrgSeverity getInitialSeverity()
```

The initial claim severity.

Returns:

a `MsdrgSeverity`.