

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. 3M 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/3mcloud/GFC-Grouper-Foundation-Classes	3M created open source binary
farser-3.3.0.jar	3.3.0	A set of utilities, parsers, and lexers that are used in conjunction with Diagnosis Related Group (DRG) logical formulas https://github.com/3mcloud/farser	3M created open source binary

Table 2. Third party open source Dependencies

Third party software name	Version	Are the distributed binaries modified by 3M?	Purpose	Licensing
Jackson Distributables: Jackson-annotations-2.9.5.jar URL: https://github.com/FasterXML/jackson	2.9.5	No modification / Not a derivative work; only aggregated with 3M software.	JSON serialization/deserialization	Copyright (c) 2007-Tatu Saloranta, tatu.saloranta@iki.fi License type: Apache License Version 2.0 URL: http://www.apache.org/licenses/LICENSE-2.0
Google Protocol Buffers Distributables: protobuf-java-4.0.0-rc-2.jar URL: https://developers.google.com/protocol-buffers	4.0.0-rc-2	No modification / Not a derivative work; only aggregated with 3M 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
SLF4J API Distributables: slf4j-api.jar URL: http://www.slf4j.org/	1.7.26	No modification / Not a derivative work; only aggregated with 3M 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-proto-generator-1.1.jar	1.1	Provide access to component core binary data necessary for proper run-time processing.	Contained in ZIP file. Separate *-sources Jar file also included
msdrg-model-1.3.0.jar	1.3.0	Provide access to component objects.	Contained in ZIP file, Separate *-sources Jar file also included
msdrg-39.1.0.2.jar	39.1.0.2	The MsDrg implementation and embedded content.	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 [11](#))).
3. Initialize and populate `RuntimeOptions` to set the individual runtime configuration options (see Class `RuntimeOptions` (page [9](#))).
4. Set `RuntimeOptions` on `Msdrgruntimeoption`.
5. Populate and build class `Msdrgrinput` to set patient demographic and claim information (see Class `Msdrgrinput`) (page [13](#)). This is done by creating lists of `Msdrgrinputprcode` and `Msdrgrinputdxcode` and enums using the various “with” methods from `Msdrgrinputbuilder` to populate the `Input` followed by calling the `.builder()` method to create an immutable object.
6. Initialize `Msdrgrcomponent` and pass in `Msdrgruntimeoption` as a parameter to create a new instance of the component (see Class `Msdrgrcomponent`) (page [11](#)).
7. Use the `process()` method on `Msdrgrcomponent` and pass in `Msdrgrclaim` as a parameter to group the claim.
8. Use the `.getOutput()` method on `Msdrgrclaim` to get the results of grouping (see Class `Msdrgrclaim` (page [12](#))).

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.msdrgr.model.MsdrgrOption;
import gov.agency.msdrgr.model.MsdrgrRuntimeOption;
import gov.agency.msdrgr.model.RuntimeOptions;
import gov.agency.msdrgr.model.enumeration.MarkingLogicTieBreaker;
import gov.agency.msdrgr.model.enumeration.MsdrgrAffectDrgOptionFlag;
import gov.agency.msdrgr.model.enumeration.MsdrgrDischargeStatus;
import gov.agency.msdrgr.model.enumeration.MsdrgrHospitalStatusOptionFlag;
import gov.agency.msdrgr.model.enumeration.MsdrgrSex;
import gov.agency.msdrgr.model.transfer.MsdrgrClaim;
import gov.agency.msdrgr.model.transfer.MsdrgrInput;
import gov.agency.msdrgr.model.transfer.MsdrgrInputDxCode;
import gov.agency.msdrgr.model.transfer.MsdrgrInputPrCode;
import gov.agency.msdrgr.model.transfer.MsdrgrOutputData;
import gov.agency.msdrgr.v391.MsdrgrComponent;
import java.util.ArrayList;
```

```
import java.util.List;
import java.util.Optional;

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

options.setPoaReportingExempt (MsdrgrHospitalStatusOptionFlag.NON_EXEMPT);
        options.setComputeAffectDrg (MsdrgrAffectDrgOptionFlag.COMPUTE);

options.setMarkingLogicTieBreaker (MarkingLogicTieBreaker.CLINICAL_SIGNIFICANCE);
        //Put RuntimeOptions on the MsdrgruntimeOption map
        runtimeOptions.put (MsdrgrOption.RUNTIME_OPTION_FLAGS, options);
        //Create list of procedure codes
        List<MsdrgrInputPrCode> procCodes = new ArrayList<>();
        procCodes.add(new MsdrgrInputPrCode ("0TY00Z0"));
        procCodes.add(new MsdrgrInputPrCode ("0FYG0Z0"));
        procCodes.add(new MsdrgrInputPrCode ("5A1D70Z"));
        //Create list of secondary diagnosis codes List<MsdrgrInputDxCode>
        sdxCodes = new ArrayList<>(); sdxCodes.add(new MsdrgrInputDxCode ("E0800",
        GfcPoa.Y));
        //Set up the claim input
        MsdrgrInput input = MsdrgrInput.builder()
            .withAdmissionDiagnosisCode (new MsdrgrInputDxCode ("I120",
        GfcPoa.Y))
            .withAgeDaysAdmit (0)
            .withAgeDaysDischarge (0)
            .withAgeInYears (0)

            .withDischargeStatus (MsdrgrDischargeStatus.HOME_SELF_CARE_ROUTINE)
            .withProcedureCodes (procCodes)
            .withSex (MsdrgrSex.MALE)
            .withPrincipalDiagnosisCode (new MsdrgrInputDxCode ("I120",
        GfcPoa.Y))
            .withSecondaryDiagnosisCodes (sdxCodes)
            .build();
        //create claim and pass in input
        MsdrgrClaim claim = new MsdrgrClaim(input);

        //initialize component with runtime options
        MsdrgrComponent component = new MsdrgrComponent(runtimeOptions);
        // Process the claim through the component
```



```

        component.process(claim);
        // Get output
        Optional<MsdrOutputData> output = claim.getOutput();
    }
}

```

Class and enum information

Class Runtime Options

Package gov.agency.msdr.model

```
public class RuntimeOptions
```

Constructors

```

RuntimeOptions()
RuntimeOptions(MsdrHospitalStatusOptionFlag poaReportingExempt,
               MsdrAffectDrgOptionFlag computeAffectDrg,
               MarkingLogicTieBreaker markingLogicTieBreaker)

```

Table 4. Method summary RuntimeOptions

Return type	Method	Description
MsdrAffectDrgOptionFlag	getComputeAffectDrg()	Get enum value for computing if a code affects DRG
MarkingLogicTieBreaker	getMarkingLogicTieBreaker()	Get enum value for how to break ties in marking logic
MsdrHospitalStatusOptionFlag	getPoaReportingExempt()	Get enum for hospital status on whether they are exempt from reporting POA
void	setComputeAffectDrg(MsdrAffectDrgOptionFlag 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.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.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.msdrgh.model.enumeration

public enum MsdrghospitalStatusOptionFlag

Table 7. Enum constant Msdrgh 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 MsdrghRuntimeOption

Package gov.agency.msdrgh.model

public class MsdrghRuntimeOption extends
com.mmm.his.cer.foundation.ComponentRuntime<MsdrghOption>

Constructor

MsdrghRuntimeOption()

Class MsdrghComponent

Package gov.agency.msdrgh.v391

public class MsdrghComponent

Constructor

MsdrghComponent(MsdrghRuntimeOption options)

Table 8. Method summary MsdrghComponent

Return type	Method	Description
void	close()	Close
RuntimeOptions	getOptions()	Getter for runtime options.

Return type	Method	Description
protected void	initialize()	Set up MSDRG component.
void	process(MsdrgClaim claim) throws FoundationException	Process a claim.
void	reconfigure(MsdrgRuntimeOption option)	Change the runtime options for a different claim

Class MsdrgClaim

Package gov.agency.msdrg.model.transfer

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

Table 9. Method summary MsdrgClaim

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

Constructor Detail

MsdrgClaim

```
public MsdrgClaim(MsdrgInput input)
```

Constructor.

Method Detail

getInput

```
public MsdrgInputData 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 MsdrInputData

getOutput

```
public java.util.Optional<MsdrOutputData> 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.transfer

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.

Modifier and Type	Method and Description
int	getAgeDaysAdmit() Get the age (in number of days) on admission.
int	getAgeDaysDischarge() Get the age (in number of days) on discharge.
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 MsdrInputData

Returns:

an Optional containing a MsdrInputDxCode.

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: MsdrgrInputData

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

Specified by:

getAgeDaysAdmit in interface MsdrgrInputData

Returns:

an integer representing the age in days.

getAgeDaysDischarge

```
public int getAgeDaysDischarge()
```

Description copied from interface: MsdrgrInputData

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

Specified by:

getAgeDaysDischarge in interface MsdrgrInputData

Returns:

an integer representing the age in days.

getSex

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

Description copied from interface: MsdrgrInputData

Get the input sex of the patient.

Specified by:

getSex in interface MsdrgrInputData

Returns:

an Optional containing a MsdrgrSex.

getSecondaryDiagnosisCodes

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

Description copied from interface: MsdrgrInputData

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.msdr.model.transfer

```
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 MsdrgOutput

Package gov.agency.msdrg.model.transfer

public class MsdrgOutput

Table 12. Method summary MsdrgOutput

Modifier and Type	Method and Description
static MsdrgOutput.MsdrgOutputBuilder	static MsdrgOutput.MsdrgOutputBuilder
boolean	equals(java.lang.Object obj)
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	getFinalMedSugType() 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.

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	getInitialMedSugType() 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.

Modifier and Type	Method and Description
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 MsdrgGrouperFlags getGrouperFlags()
```

Description copied from interface: MsdrgOutputData

Get the grouper flags used during processing.

Specified by:

getGrouperFlags in interface MsdrgOutputData

Returns:

an MsdrgGrouperFlags object.

getInitialGrc

```
public MsdrgGrouperReturnCode getInitialGrc()
```

Description copied from interface: MsdrgOutputData

Get the grouper return code for the initial grouping.

Specified by:

getInitialGrc in interface MsdrgOutputData

Returns:

a MsdrgGrouperReturnCode

getInitialMdc

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

Description copied from interface: MsdrOutputData

Get the major diagnostic category for the initial grouping.

Specified by:

getInitialMdc in interface MsdrOutputData

Returns:

a MsdrValue representing the major diagnostic category and description.

getInitialDrg

```
public MsdrValue<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.

getInitialMedSugType

```
public MsdrMedSurgType getInitialMedSugType()
```

Description copied from interface: MsdrOutputData

Get the MsdrMedSurgType for initial grouping.

Specified by:

getInitialMedSugType 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.

getFinalMedSugType

```
public MsdrMedSurgType getFinalMedSugType()
```

Description copied from interface: MsdrOutputData

Get the MsdrMedSurgType for initial grouping.

Specified by:

getFinalMedSugType 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 MsdrOutputDxCode 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 MsdrOutputDxCode 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 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

```
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 MsdrghacStatus

Package gov.agency.msdrgh.model.enumeration

public enum MsdrghacStatus

Table 13. Enum constant Msdrgh 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
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 MsdrghCodeSeverityFlag

Package gov.agency.msdrgh.model.enumeration

public enum MsdrghCodeSeverityFlag

Table 14. Enum constant Msdrgh Code Severity Flag

Enum constant	Description
MCC	Code was a MCC
CC	Code was a CC
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 MsdrnPoaErrorCode

Package gov.agency.msdrp.model.enumeration

public enum MsdrnPoaErrorCode

Table 15. Enum constant Msdrp 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 MsdrpGroupingImpact

Package gov.agency.msdrp.model.enumeration

public enum MsdrpGroupingImpact

Table 16. Enum constant Msdrp 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
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 MsdrGSex

Package gov.agency.msdrG.model.enumeration

public enum MsdrGSex

Table 18. Enum constant MsdrGSex

Enum constant	Description
UNKNOWN	Unknown
MALE	Male
FEMALE	Female

Enum MsdrMedSurgType

Package gov.agency.msdr.model.enumeration

public enum MsdrMedSurgType

Table 19. Enum constant Msdr 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.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.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

Enum constant	Description
FINAL_DRG_UNGROUPABLE	When processing HAC's the claim is ungroupable
NOT_APPLICABLE	N/A

Enum MsdrGAdmitDxGrouperFlag

Package gov.agency.msdrG.model.enumeration

Table 22. Enum constant MsdrG 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.msdrG.model.enumeration

Table 23. Enum constant MsdrG Grouper 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

Enum constant	Description
INVALID_SEX	Invalid sex
OK	DRG successfully assigned

Enum MsdrgrDischargeStatus

Package gov.agency.msdrgr.model.enumeration

public enum MsdrgrDischargeStatus

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 MsdrInputDxCode

Package gov.agency.msdrg.model.transfer

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

Immutable class for DX input codes.

Constructor and Description

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

Table 24. Method summary MsdrDiagnosisCode

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

MsdrInputDxCode

```
public MsdrInputDxCode(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

MsdrgInputPrCode

public MsdrgInputPrCode(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 **MsdrgOutputDxCode**

`gov.agency.msdrg.model.transfer.MsdrgOutputDxCode`

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

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

Constructor and Description

`MsdrgOutputDxCode(MsdrgInputDxCode inputDxCode, MsdrgDiagnosisFlag flags)`

Table 26. Method Summary Class MsdrgOutputDxCode

Modifier and Type	Method and Description
boolean	<code>equals(java.lang.Object obj)</code>

Modifier and Type	Method and Description
MsdrgGroupingImpact	getDiagnosisAffectsDrg()
MsdrgCodeSeverityFlag	getFinalSeverityUsage()
java.util.List<MsdrgHac>	getHacs()
MsdrgCodeSeverityFlag	getInitialSeverityUsage()
MsdrgInputDxCODE	getInputDxCODE()
java.lang.String	getLegacyFlagString()
MsdrgPoaErrorCode	getPoaErrorCode()
int	hashCode()
boolean	isDiagnosisRecognizedByGrouper()

Methods inherited from class java.lang.Object

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

Constructor Detail

```
public MsdrgOutputDxCODE (MsdrgInputDxCODE inputDxCODE,
                          MsdrgDiagnosisFlag flags)
```

Method Detail

getInputDxCODE

```
public MsdrgInputDxCODE getInputDxCODE()
```

isDiagnosisRecognizedByGrouper

```
public boolean isDiagnosisRecognizedByGrouper()
```

getDiagnosisAffectsDrg

```
public MsdrgGroupingImpact getDiagnosisAffectsDrg()
```

getFinalSeverityUsage

```
public MsdrgCodeSeverityFlag getFinalSeverityUsage()
```

getInitialSeverityUsage

```
public MsdrgCodeSeverityFlag getInitialSeverityUsage()
```

getPoaErrorCode

```
public MsdrnPoaErrorCode getPoaErrorCode()
```

getHacs

```
public java.util.List<MsdrnHac> 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 MsdrnOutputPrCode

gov.agency.msdrn.model.transfer.MsdrnOutputPrCode

```
public class MsdrnOutputPrCode
```

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

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

Constructor and Description

MsdrnOutputPrCode(MsdrnInputPrCode inputPrCode, MsdrnProcedureFlag flags)

Table 27. Method Summary Class MsdrnOutputPrCode

Modifier and Type	Method and Description
boolean	equals(java.lang.Object o)
java.util.Set<MsdrnProcedureHacUsage>	getHacUsage()

Modifier and Type	Method and Description
MsdrgInputPrCode	getInputPrCode()
java.lang.String	getLegacyFlagString()
MsdrgGroupingImpact	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<MsdrgrProcedureHacUsage> 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 MsdrgrOutputData

```
public interface MsdrgrOutputData
```

Output data interface.

Table 28. Method Summary Interface MsdrgrOutputData

Modifier and Type	Method and Description
MsdrgrValue<java.lang.Integer>	getFinalBaseDrg() Get the base diagnosis related group for the final grouping.
MsdrgrValue<java.lang.Integer>	getFinalDrg() Get the diagnosis related group for the final grouping.
MsdrgrSeverity	getFinalDrgSdxSeverity() Get the Final DRG secondary diagnosis severity.
MsdrgrGrouperReturnCode	getFinalGrc() Get the grouper return code for the final grouping.

Modifier and Type	Method and Description
MsdrgValue<java.lang.Integer>	getFinalMdc() Get the major diagnostic category for the final grouping.
MsdrgMedSurgType	getFinalMedSugType() 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.
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	getInitialMedSugType() Get the MsdrgMedSurgType for initial grouping.
MsdrgSeverity	getInitialSeverity() The initial claim severity.
int	getNumHacCategoriesSatisfied() Get the number of distinct HAC categories that were satisfied.

Modifier and Type	Method and Description
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 getInitialMedSugType()
```

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 MsdrgValue representing the base diagnosis related group and description.

getFinalGrc

```
MsdrgGrouperReturnCode getFinalGrc()
```

Get the grouper return code for the final grouping.

Returns:

a MsdrgGrouperReturnCode

getFinalMdc

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

Get the major diagnostic category for the final grouping.

Returns:

a MsdrgValue representing the major diagnostic category and description.

getFinalDrg

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

Get the diagnosis related group for the final grouping.

Returns:

a MsdrtheValue representing the diagnosis related group and description.

getFinalMedSugType

```
MsdrMedSurgType getFinalMedSugType()
```

Get the MsdrMedSurgType for initial grouping.

Returns:

an enum representing the type.

getFinalBaseDrg

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

Get the base diagnosis related group for the final grouping.

Returns:

a MsdrValue representing the base diagnosis related group and description.

getFinalDrgSdxSeverity

```
MsdrSeverity getFinalDrgSdxSeverity()
```

Get the Final DRG secondary diagnosis severity.

Returns:

a MsdrSeverity

getInitialDrgSdxSeverity

```
MsdrSeverity getInitialDrgSdxSeverity()
```

Get the Initial DRG secondary diagnosis severity.

Returns:

a MsdrSeverity

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<MsdrgOutputDxCode> 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 MsdrgOutputDxCode being created even for null input.

Returns:

an UNMODIFIABLE collection of MsdrgOutputDxCodes 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

```
MsdrgOutputDxCode 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 MsdrgOutputDxCode being created even for null input.

Parameters:

sdxCodeIndex - the index of the secondary diagnosis 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.

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

```
MsdrOutputPrCode 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 MsdrOutputPrCode being created even for null input.

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

```
MsdrSeverity getFinalSeverity()
```

The final claim severity.

Returns:

a MsdrSeverity.

getInitialSeverity

```
MsdrgSeverity getInitialSeverity()
```

The initial claim severity.

Returns:

a MsdrgSeverity.