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

Table 2. Third party open source Dependencies

Third party software name	Version	Are the distributed binaries modified by 3M?	Purpose	Licensing
Google Protocol Buffers Distributables: protobuf-java-3.21.1.jar URL: https://developers.google.com/protocol-buffers	3.21.1	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/ptII11.0/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-model-v2.2.0.0.jar	2.0.0	Provide access to component objects.	Contained in ZIP file, Separate *-sources Jar file also included
msdrg-v400-40.0.0.3.jar	40.0.0.3	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 MsdrgInput to set patient demographic and claim information (see Class MsdrgInput) (page 13). This is done by creating lists of MsdrgInputPrCode and MsdrgInputDxCode and enums using the various "with" methods from MsdrgInputBuilder to populate the Input followed by calling the .builder() method to create an immutable object.
6. Initialize MsdrgComponent and pass in MsdrgRuntimeOption as a parameter to create a new instance of the component (see Class MsdrgComponent) (page 11).
7. Use the process() method on MsdrgComponent and pass in MsdrgClaim as a parameter to group the claim.
8. Use the .getOutput() method on MsdrgClaim to get the results of grouping (see Class MsdrgClaim (page 11)).

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.msdrg.model.v2.MsdrgOption;
import gov.agency.msdrg.model.v2.MsdrgRuntimeOption;
import gov.agency.msdrg.model.v2.RuntimeOptions;
import gov.agency.msdrg.model.v2.enumeration.MarkingLogicTieBreaker;
import gov.agency.msdrg.model.v2.enumeration.MsdrgAffectDrgOptionFlag;
import gov.agency.msdrg.model.v2.enumeration.MsdrgDischargeStatus;
import
gov.agency.msdrg.model.v2.enumeration.MsdrgHospitalStatusOptionFlag;
import gov.agency.msdrg.model.v2.enumeration.MsdrgSex;
import gov.agency.msdrg.model.v2.transfer.MsdrgClaim;
import gov.agency.msdrg.model.v2.transfer.input.MsdrgInput;
import gov.agency.msdrg.model.v2.transfer.input.MsdrgInputDxCode;
import gov.agency.msdrg.model.v2.transfer.input.MsdrgInputPrCode;
import gov.agency.msdrg.model.v2.transfer.output.MsdrgOutputData;
import gov.agency.msdrg.v400.MsdrgComponent;
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(MsdrgHospitalStatusOptionFlag.NON_EXEMPT);
        options.setComputeAffectDrg(MsdrgAffectDrgOptionFlag.COMPUTE);

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

.withDischargeStatus(MsdrgDischargeStatus.HOME_SELFCARE_ROUTINE)
            .withProcedureCodes(procCodes)
            .withSex(MsdrgSex.MALE)
            .withPrincipalDiagnosisCode(new MsdrgInputDxCode("I120",
GfcPoa.Y))
            .withSecondaryDiagnosisCodes(sdxCodes)
            .build();
        //create claim and pass in input
        MsdrgClaim claim = new MsdrgClaim(input);

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

    }
}
```

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 computerAffectDrg)	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.
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 Msdrg 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 MsdrgRuntimeOption

Package gov.agency.msdrg.model.v2

public class MsdrgRuntimeOption extends
com.mmm.his.cer.foundation.ComponentRuntime<MsdrgOption>

Constructor

MsdrgRuntimeOption()

Class MsdrgComponent

Package gov.agency.msdrg.v400

public class MsdrgComponent

Constructor

MsdrgComponent(MsdrgRuntimeOption options)

Table 8. Method summary MsdrgComponent

Return type	Method	Description
void	close()	Close
RuntimeOptions	getOptions()	Getter for runtime options.
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.v2.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 MsdrgInputData

getOutput

```
public java.util.Optional<MsdrgOutputData> 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 MsdrgInputData.

setOutput

```
public void setOutput(MsdrgOutput 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 MsdrgInput

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

Table 10. Method summary MsdrgInput

Modifier and Type	Method and Description
static MsdrgInput.MsdrgInputBuilder	builder()
boolean	equals(java.lang.Object obj)
java.util.Optional<MsdrgInputDxCode>	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<MsdrgDischargeStatus>	getDischargeStatus() Get the input discharge status.
java.util.Optional<MsdrgInputDxCode>	getPrincipalDiagnosisCode() Get the input principal diagnosis.
java.util.List<MsdrgInputPrCode>	getProcedureCodes() Get the input procedure codes.
java.util.List<MsdrgInputDxCode>	getSecondaryDiagnosisCodes() Get the input secondary diagnosis codes.
java.util.Optional<MsdrgSex>	getSex() Get the input sex of the patient.
int	hashCode()
MsdrgInput.MsdrgInputBuilder	toBuilder()

Methods inherited from class java.lang.Object

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

Method Detail

getAdmissionDiagnosisCode

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

Description copied from interface: MsdrgInputData

Get the input admission diagnosis.

Specified by:

getAdmissionDiagnosisCode in interface MsdrgInputData

Returns:

an Optional containing a MsdrgInputDxCode.

getPrincipalDiagnosisCode

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

Description copied from interface: MsdrgInputData

Get the input principal diagnosis.

Specified by:

getPrincipalDiagnosisCode in interface MsdrgInputData

Returns:

an Optional containing a MsdrgInputDxCode.

getAgeInYears

```
public int getAgeInYears()
```

Description copied from interface: MsdrgInputData

Get the patient age in years.

Specified by:

getAgeInYears in interface MsdrgInputData

Returns:

an integer representing the age.

getDischargeStatus

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

Description copied from interface: MsdrgInputData

Get the input discharge status..

Specified by:

getDischargeStatus in interface MsdrgInputData

Returns:

an Optional containing a MsdrgDischargeStatus.

getAgeDaysAdmit

```
public int getAgeDaysAdmit()
```

Description copied from interface: MsdrgInputData

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

Specified by:

getAgeDaysAdmit in interface MsdrgInputData

Returns:

an integer representing the age in days.

getAgeDaysDischarge

```
public int getAgeDaysDischarge()
```

Description copied from interface: MsdrgInputData

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

Specified by:

getAgeDaysDischarge in interface MsdrgInputData

Returns:

an integer representing the age in days.

getSex

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

Description copied from interface: MsdrgInputData

Get the input sex of the patient.

Specified by:

getSex in interface MsdrgInputData

Returns:

an Optional containing a MsdrgSex.

getSecondaryDiagnosisCodes

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

Description copied from interface: MsdrgInputData

Get the input secondary diagnosis codes.

Specified by:

getSecondaryDiagnosisCodes in interface MsdrgInputData

Returns:

a List containing a MsdrgInputDxCode.

getProcedureCodes

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

Description copied from interface: MsdrgInputData

Get the input procedure codes.

Specified by:

getProcedureCodes in interface MsdrgInputData

Returns:

a List containing a MsdrgInputPrCode.

builder

```
public static MsdrgInput.MsdrgInputBuilder builder()
```

toBuilder

```
public MsdrgInput.MsdrgInputBuilder toBuilder()
```

Specified by:

toBuilder in interface DataBuilder<MsdrgInput.MsdrgInputBuilder>

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 MsdrgInputBuilder

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

```
public static final class MsdrgInput.MsdrgInputBuilder
```

extends java.lang.Object

Builder for MsdrgInput.

Table 11. Method Summary MsdrgInputBuilder

Modifier and Type	Method and Description
MsdrgInput	build() Build a new instance.
MsdrgInput.MsdrgInputBuilder	withAdmissionDiagnosisCode(MsdrgInputDxCode admissionDiagnosisCode)
MsdrgInput.MsdrgInputBuilder	withAgeDaysAdmit(int ageDaysAdmit)
MsdrgInput.MsdrgInputBuilder	withAgeDaysDischarge(int ageDaysDischarge)
MsdrgInput.MsdrgInputBuilder	withAgeInYears(int ageInYears)
MsdrgInput.MsdrgInputBuilder	withDischargeStatus(MsdrgDischargeStatus dischargeStatus)
MsdrgInput.MsdrgInputBuilder	withPrincipalDiagnosisCode(MsdrgInputDxCode principalDiagnosisCode)
MsdrgInput.MsdrgInputBuilder	withProcedureCodes(java.util.List<MsdrgInputPrCode> procedureCodes)
MsdrgInput.MsdrgInputBuilder	withSecondaryDiagnosisCodes(java.util.List<MsdrgInputDxCode> secondaryDiagnosisCodes)
MsdrgInput.MsdrgInputBuilder	withSex(MsdrgSex sex)

Methods inherited from class java.lang.Object

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

Method Detail

withAdmissionDiagnosisCode

```
public MsdrgInput.MsdrgInputBuilder
withAdmissionDiagnosisCode(MsdrgInputDxCode admissionDiagnosisCode)
```

withPrincipalDiagnosisCode

```
public MsdrgInput.MsdrgInputBuilder
withPrincipalDiagnosisCode(MsdrgInputDxCode principalDiagnosisCode)
```

withAgeInYears

```
public MsdrgInput.MsdrgInputBuilder withAgeInYears(int ageInYears)
```

withDischargeStatus

```
public MsdrgInput.MsdrgInputBuilder
withDischargeStatus(MsdrgDischargeStatus dischargeStatus)
```

withAgeDaysAdmit

```
public MsdrgInput.MsdrgInputBuilder withAgeDaysAdmit(int ageDaysAdmit)
```

withAgeDaysDischarge

```
public MsdrgInput.MsdrgInputBuilder withAgeDaysDischarge(int
ageDaysDischarge)
```

withSex

```
public MsdrgInput.MsdrgInputBuilder withSex(MsdrgSex sex)
```

withSecondaryDiagnosisCodes

```
public MsdrgInput.MsdrgInputBuilder
withSecondaryDiagnosisCodes(java.util.List<MsdrgInputDxCode>
secondaryDiagnosisCodes)
```

withProcedureCodes

```
public MsdrgInput.MsdrgInputBuilder
withProcedureCodes(java.util.List<MsdrgInputPrCode> procedureCodes)
```

build

```
public MsdrgInput build()
```

Build a new instance.

Returns:

new instance of MsdrgInput.

Class MsdrgOutput

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

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)

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

Description copied from interface: MsdrgOutputData

Get the diagnosis related group for the initial grouping.

Specified by:

getInitialDrg in interface MsdrgOutputData

Returns:

a MsdrgValue representing the diagnosis related group and description.

getInitialMedSurgType

```
public MsdrgMedSurgType getInitialMedSurgType()
```

Description copied from interface: MsdrgOutputData

Get the MsdrgMedSurgType for initial grouping.

Specified by:

getInitialMedSurgType in interface MsdrgOutputData

Returns:

an enum representing the type.

getInitialBaseDrg

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

Description copied from interface: MsdrgOutputData

Get the base diagnosis related group for the initial grouping.

Specified by:

getInitialBaseDrg in interface MsdrgOutputData

Returns:

a MsdrgValue representing the base diagnosis related group and description.

getFinalGrc

```
public MsdrgGrouperReturnCode getFinalGrc()
```

Description copied from interface: MsdrgOutputData

Get the grouper return code for the final grouping.

Specified by:

getFinalGrc in interface MsdrgOutputData

Returns:

a MsdrgGrouperReturnCode

getFinalMdc

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

Description copied from interface: MsdrgOutputData

Get the major diagnostic category for the final grouping.

Specified by:

getFinalMdc in interface MsdrgOutputData

Returns:

a MsdrgValue representing the major diagnostic category and description.

getFinalDrg

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

Description copied from interface: MsdrgOutputData

Get the diagnosis related group for the final grouping.

Specified by:

getFinalDrg in interface MsdrgOutputData

Returns:

a MsdrgValue representing the diagnosis related group and description.

getFinalMedSurgType

```
public MsdrgMedSurgType getFinalMedSurgType()
```

Description copied from interface: MsdrgOutputData

Get the MsdrgMedSurgType for initial grouping.

Specified by:

getFinalMedSurgType in interface MsdrgOutputData

Returns:

an enum representing the type.

getPdxOutput

```
public MsdrgOutputDxCode getPdxOutput()
```

Description copied from interface: MsdrgOutputData

Get principal diagnosis output.

Specified by:

getPdxOutput in interface MsdrgOutputData

Returns:

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

getFinalBaseDrg

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

Description copied from interface: MsdrgOutputData

Get the base diagnosis related group for the final grouping.

Specified by:

getFinalBaseDrg in interface MsdrgOutputData

Returns:

a MsdrgValue representing the base diagnosis related group and description.

getFinalDrgSdxSeverity

```
public MsdrgSeverity getFinalDrgSdxSeverity()
```

Description copied from interface: MsdrgOutputData

Get the Final DRG secondary diagnosis severity.

Specified by:

getFinalDrgSdxSeverity in interface MsdrgOutputData

Returns:

a MsdrgSeverity

getInitialDrgSdxSeverity

```
public MsdrgSeverity getInitialDrgSdxSeverity()
```

Description copied from interface: MsdrgOutputData

Get the Initial DRG secondary diagnosis severity.

Specified by:

getInitialDrgSdxSeverity in interface MsdrgOutputData

Returns:

a MsdrgSeverity

getNumHacCategoriesSatisfied

```
public int getNumHacCategoriesSatisfied()
```

Description copied from interface: MsdrgOutputData

Get the number of distinct HAC categories that were satisfied.

Specified by:

getNumHacCategoriesSatisfied in interface MsdrgOutputData

Returns:

int representing the number of HAC categories.

getHacStatus

```
public MsdrgHacStatus getHacStatus()
```

Description copied from interface: MsdrgOutputData

Get the HAC status.

Specified by:

getHacStatus in interface MsdrgOutputData

Returns:

a MsdrgHacStatus

getSdxOutput

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

Description copied from interface: MsdrgOutputData

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.

Specified by:

getSdxOutput in interface MsdrgOutputData

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

```
public MsdrgOutputDxCode getSdxOutput(int sdxCodeIndex)
```

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

Description copied from interface: MsdrgOutputData

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.

Specified by:

getSdxOutput in interface MsdrgOutputData

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

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

Description copied from interface: MsdrgOutputData

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 MsdrgOutputPrCode being created even for null input.

Specified by:

getProcOutput in interface MsdrgOutputData

Returns:

an UNMODIFIABLE collection of MsdrgOutputPrCodes 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 MsdrgOutputPrCode getProcOutput(int procCodeIndex)
```

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

Description copied from interface: MsdrgOutputData

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.

Specified by:

getProcOutput in interface MsdrgOutputData

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

```
public MsdrgSeverity getFinalSeverity()
```

Description copied from interface: MsdrgOutputData

The final claim severity.

Specified by:

getFinalSeverity in interface MsdrgOutputData

Returns:

a MsdrgSeverity.

getInitialSeverity

```
public MsdrgSeverity getInitialSeverity()
```

Description copied from interface: MsdrgOutputData

The initial claim severity.

Specified by:

getInitialSeverity in interface MsdrgOutputData

Returns:

a MsdrgSeverity.

builder

```
public static MsdrgOutput.MsdrgOutputBuilder builder()
```

toBuilder

```
public MsdrgOutput.MsdrgOutputBuilder 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.msdrg.model.v2.enumeration

public enum MsdrgHacStatus

Table 13. Enum constant Msdrg 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 MsdrgCodeSeverityFlag

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

public enum MsdrgCodeSeverityFlag

Table 14. Enum constant Msdrg 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 MsdrgPoaErrorCode

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

public enum MsdrgPoaErrorCode

Table 15. Enum constant Msdrg 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"

Enum constant	Description
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 MsdrgGroupingImpact

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

public enum MsdrgGroupingImpact

Table 16. Enum constant Msdrg 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

Enum constant	Description
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.v2.enumeration

public enum MsdrgSex

Table 18. Enum constant MsdrgSex

Enum constant	Description
UNKNOWN	Unknown
MALE	Male
FEMALE	Female

Enum MsdrgMedSurgType

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

public enum MsdrgMedSurgType

Table 19. Enum constant Msdrg Medical Surgical Type

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

Enum MsdrgSeverity

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

public enum MsdrgSeverity

Table 20. Enum constant Msdrg Severity

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

Enum MsdrgGrouperFlagHacStatus

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

Table 21. Enum constant Msdrg 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 MsdrgAdmitDxGrouperFlag

Package gov.agency.msdrg.model.v2.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 MsdrgGrouperReturnCode

Package gov.agency.msdrg.model.v2.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_HACS_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 orW
HAC_STATUS_INVALID_POA_INVALID_OR_1	Hospital Status is invalid or missing and at least one POA is invalid or missing or 1
HAC_STATUS_INVALID_POA_N_OR_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.msdrg.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_SELFCARE_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)
com.mmm.his.cer.foundation.model.GfcPoa	getPoa()

Modifier and Type	Method and Description
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 MsdrgInputPrCode

public class MsdrgInputPrCode
extends java.lang.Object

Immutable class for PR input codes.

Constructor and Description

MsdrgInputPrCode(java.lang.String value)

Table 25. Method summary MsdrgProcedureCode

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.v2.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	equals(java.lang.Object obj)
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 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 MsdrgOutputPrCode

gov.agency.msdrg.model.v2.transfer.output.MsdrgOutputPrCode

public class MsdrgOutputPrCode
extends java.lang.Object

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

Constructor and Description

MsdrgOutputPrCode(MsdrgInputPrCode inputPrCode, MsdrgProcedureFlag flags)

Table 27. Method Summary Class MsdrgOutputPrCode

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

public interface MsdrgOutputData

Output data interface.

Table 28. Method Summary Interface MsdrgOutputData

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.

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 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 MsdrgValue representing the diagnosis related group and description.

getFinalMedSurgType

```
MsdrgMedSurgType getFinalMedSurgType()
```

Get the MsdrgMedSurgType for initial grouping.

Returns:

an enum representing the type.

getFinalBaseDrg

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

Get the base diagnosis related group for the final grouping.

Returns:

a MsdrgValue 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<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<MsdrgOutputPrCode> 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 MsdrgOutputPrCode being created even for null input.

Returns:

an UNMODIFIABLE collection of MsdrgOutputPrCodes 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.