

# Order Extension Module

## Overview

This module aims to extend the Order API available in OpenMRS 1.9 and earlier, by building the following features:

- Support for creating Order Sets, which allow users to pre-define a set of Order templates
- Support for associating several Orders together in an Order Group
- Extending the Order and DrugOrder objects with the addition of several new fields
- New UI components for managing and viewing OrderSets and OrderGroups

## Order Set Design

```
class OrderSet extends BaseOpenmrsMetadata {
    Operator operator;
    Concept indication;
    boolean cyclical;
    Integer cycleLengthInDays;
    List<OrderSetMember> members;
}

abstract class OrderSetMember extends BaseOpenmrsObject {
    OrderSet orderSet;
    String title;
    String comment;
    boolean selected;
    Integer relativeStartDay;
    Integer lengthInDays;
    String template;
}

abstract class SingleOrderSetMember extends OrderSetMember {
    abstract OrderType getOrderType();
    Concept concept;
    Concept indication;
    String instructions;
}

class TestOrderSetMember extends SingleOrderSetMember {
    OrderType getOrderType() { test order }
}

class DrugOrderSetMember extends SingleOrderSetMember {
    OrderType getOrderType() { ORDERTYPE_DRUG }
    Drug drug;
    Double dose;
    String units;
    Concept route;
    String frequency;
    boolean asNeeded;
    String administrationInstructions;
}

class NestedOrderSetMember extends OrderSetMember {
    OrderSet nestedOrderSet;
}
```

## Order Group Design

```

abstract class OrderGroup extends BaseOpenmrsData {
    OrderSet orderSet;
}

class DrugRegimen extends OrderGroup {
    List<ExtendedDrugOrder> members;
    Integer cycleNumber;
}

```

## Order Extensions

```

interface GroupableOrder extends OpenmrsData {
    Integer getOrderId();
    void setOrderId(Integer orderId);
    Patient getPatient();
    void setPatient(Patient patient);
    OrderType getOrderType();
    void setOrderType(OrderType orderType);
    Concept getConcept();
    void setConcept(Concept concept);
    String getInstructions();
    void setInstructions(String instructions);
    Date getStartDate();
    void setStartDate(Date startDate);
    Date getAutoExpireDate();
    void setAutoExpireDate(Date autoExpireDate);
    Encounter getEncounter();
    void setEncounter(Encounter encounter);
    User getOrderer();
    void setOrderer(User orderer);
    Boolean getDiscontinued();
    void setDiscontinued(Boolean discontinued);
    User getDiscontinuedBy();
    void setDiscontinuedBy(User discontinuedBy);
    Date getDiscontinuedDate();
    void setDiscontinuedDate(Date discontinuedDate);
    Concept getDiscontinuedReason();
    void setDiscontinuedReason(Concept discontinuedReason);
    String getDiscontinuedReasonNonCoded();
    void setDiscontinuedReasonNonCoded(String discontinuedReasonNonCoded);
    String getAccessionNumber();
    void setAccessionNumber(String accessionNumber);
}

class ExtendedOrder extends Order implements GroupableOrder {
    OrderGroup group
}

class ExtendedDrugOrder extends DrugOrder implements GroupableOrder {
    OrderGroup group;
    Concept indication;
    Concept route;
    String administrationInstructions;
}

```


## API

```

OrderExtensionService extends OpenmrsService {
    OrderSet getOrderSet(Integer id);
    OrderSet getOrderSetByUuid(String uuid);
    List<OrderSet> getNamedOrderSets(boolean includeRetired);
    List<OrderSet> findAvailableOrderSets(String partialName, Concept indication);
    OrderSet saveOrderSet(OrderSet orderSet);
    void purgeOrderSet(OrderSet orderSet);
    OrderSetMember getOrderSetMember(Integer id);
    List<OrderSet> getParentOrderSets(OrderSet orderSet);
    <T extends OrderGroup> T saveOrderGroup(T orderGroup);
    <T extends OrderGroup> List<T> getOrderGroups(Patient patient, Class<T> type);
    void addOrdersForPatient(Patient patient, OrderSet orderSet, Date startDate, Integer numCycles);
    OrderGroup getOrderGroup(Integer id);
    DrugRegimen getDrugRegimen(Integer id);
    Integer getMaxNumberOfCyclesForRegimen(Patient patient, DrugRegimen regimen);
    List<ExtendedDrugOrder> getFutureDrugOrdersOfSameOrderSet(Patient patient, OrderSet orderSet, Date startDate);
    List<DrugRegimen> getFutureDrugRegimensOfSameOrderSet(Patient patient, DrugRegimen drugRegimen, Date
startDate);
    List<ExtendedDrugOrder> getExtendedDrugOrders(Patient patient, Concept indication, Date startDateAfter, Date
startDateBefore);
}

```

## Screenshots


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Home
Find/Create Patient
Dictionary
Reporting
Administration









[Admin](#) | [Manage Orders](#) | [Manage Drug Orders](#) | [Manage Order Types](#) | [Manage Order Sets](#)

### View Order Set: HREZ

**Details**
[Edit](#)

**Name:** HREZ  
**Description:** Standard TB Treatment Drug Regimen  
**Operator:** ALL  
**Indication:** TUBERCULOSIS  
**Cyclical:** False

**Members**
Add: | [Lab Test Order](#) | [Drug Order](#) | [Nested Order Set](#)

-   ISONIAZID 100.0 mg ORAL 3/day x 7 days/week
-   RIFAMPICIN 300.0 mg ORAL 2/day x 7 days/week
-   PYRAZINAMIDE 500.0 mg ORAL 3/day x 7 days/week
-   ETHAMBUTOL 400.0 mg ORAL 2/day x 7 days/week

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### HREZ: Edit Drug Order

#### Descriptive Title and Comments

Title

Comment

#### Start Day and Length specifications

Selected By Default

Start Day  (relative to overall Order Set)

Length  Days

#### Drug Order Details

Generic Drug

Specific Drug

Indication / Reason for order

Instructions

Dose

Units

Route

Frequency

As Needed

Administration Instructions

### Mr. Horatio L Hornblower Esq.

OpenMRS Identification Number: **101-6**

71 yrs ( May 1, 1941)

Old Identification Number: 101

**BMI: ? ( Weight , Height )** CD4: | Regimen:

[Overview](#) | [Regimens](#) | [Visits](#) | [Demographics](#) | [Graphs](#) | [Form Entry](#)

[Drug List View](#) | [Calendar View](#)

#### Current Regimens

#### Future Regimens

#### Completed Regimens

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Home | Find/Create Patient | Dictionary | Reporting | Administration

## Mr. Horatio L Hornblower Esq.

### Add New Medication/s

Choose a pre-defined Order Set:

Choose a pre-defined Order Set\*: TUBERCULOSIS - HREZ Start Day\*:  (mm/dd/yyyy)

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## Mr. Horatio L Hornblower Esq.

OpenMRS Identification Number: **101-6**  
Old Identification Number: 101

71 yrs ( May 1, 1941) | BMI: ? ( Weight: , Height: ) CD4: | Regimen: HREZ

Start Visit:

[Drug List View](#) | [Calendar View](#)

### Current Regimens

#### TUBERCULOSIS

Regimens

**Start date: Jul 1, 2012**

Item ordered	Dose/Units	Route	Frequency	Duration (days)	Administration Instructions	Start date	Scheduled Stop Date	Warnings and Precautions
ISONIAZID	100.0 mg	ORAL	3/day x 7 days/week			Jul 1, 2012		<input type="button" value="Stop"/> <input type="button" value="Edit"/> <input type="button" value="Delete"/>
RIFAMPICIN	300.0 mg	ORAL	2/day x 7 days/week			Jul 1, 2012		<input type="button" value="Stop"/> <input type="button" value="Edit"/> <input type="button" value="Delete"/>
PYRAZINAMIDE	500.0 mg	ORAL	3/day x 7 days/week			Jul 1, 2012		<input type="button" value="Stop"/> <input type="button" value="Edit"/> <input type="button" value="Delete"/>
ETHAMBUTOL	400.0 mg	ORAL	2/day x 7 days/week			Jul 1, 2012		<input type="button" value="Stop"/> <input type="button" value="Edit"/> <input type="button" value="Delete"/>

Future Regimens

Completed Regimens

Mr. Horatio L Hornblower Esq.

OpenMRS Identification Number: 101-6

Add New Medication/s

Choose a pre-defined Order Set [Add New Medication/s](#)

Choose an individual drug\*: Triomune-30 x Drug form\*: Triomune-30

Patient prescription details:

Dose\*:  mg Frequency: 1/day x   As Needed

Start Day\*:  (mm/dd/yyyy) Stop date:  (mm/dd/yyyy)

Reason for prescription:

Administration Instructions:  Warnings and Precautions:

[Add](#) [Cancel](#)

Completed Regimens

Mr. Horatio L Hornblower Esq.

OpenMRS Identification Number: 101-6

71 yrs ( May 1, 1941)

Old Identification Number: 101

BMI: ? ( Weight, Height ) CD4: | Regimen: HREZ

[Start Visit](#)

[Overview](#) | [Regimens](#) | [Visits](#) | [Demographics](#) | [Graphs](#) | [Form Entry](#)

[Add New Medication/s](#)

[Drug List View](#) | [Calendar View](#)

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July 2012

today

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21

Ongoing

Item ordered	Dose/Units	Frequency	Start date
ISONIAZID	100.0	3/day x 7 days/week	Jul 1, 2012
RIFAMPICIN	300.0	2/day x 7 days/week	Jul 1, 2012
PYRAZINAMIDE	500.0	3/day x 7 days/week	Jul 1, 2012
ETHAMBUTOL	400.0	2/day x 7 days/week	Jul 1, 2012