Orders and Drugs

A programmer's guide

What is an order?

- It's a request made by a user (usually a provider) on behalf of a patient
- Intended to be processed by another system or component within OpenMRS

Order types

- OpenMRS allows us define our own types of orders
- Two types are built-in:
  - **Lab test** – this is a request by a clinician for a specific laboratory test for a patient
  - **Drug order** – this is a request by a provider for a specific drug for a patient

Administration > Manage Order Types

Order Type Management

Add Order Type

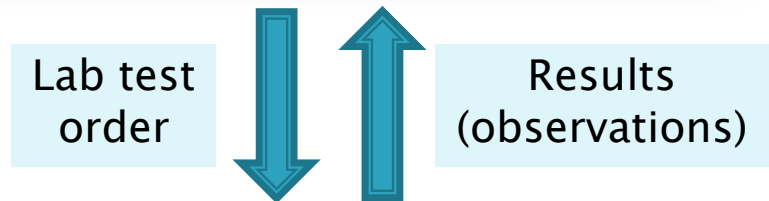| Current Order Types	
Name	**Description**
☐ Drug order	Order of medications for the patient
☐ Lab test	An order by a clinician for a laboratory test
☐ ~~Lunch order~~	~~so hungry~~

Delete Selected Order Types

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Lab test orders

- A clinician can order a lab test
- A separate laboratory module or system should then allow lab technicians to see ordered tests and submit their results

Order

Patient	Horatio L Hornblower	Change
Order type	Lab test ▾	
Related Concept	LABORATORY ORDERS	Change
Instructions		
Start date	02/10/2010 (dd/mm/yyyy)	
Auto-expire date	(dd/mm/yyyy)	
Related Encounter	Select	
Orderer	Rowan Patrick Seymour	Change

Save Order
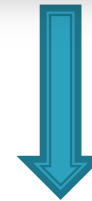
Lab test order ⬇ ⬆ Results (observations)

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Drug orders

- A provider can create this to order drugs for a patient
- A separate pharmacy module or system should then allow a pharmacist to process that order

Drug Order

Patient	Horatio L Hornblower [Change]
Order type	Drug order ▾
Related Concept	ARVS [Change]
Instructions	
Start date	02/10/2010 (dd/mm/yyyy)
Auto-expire date	23/10/2010 (dd/mm/yyyy)
Related Encounter	[Select]
Orderer	Rowan Patrick Seymour [Change]
Dose	50
Units	mg
Frequency	
PRN	◉ No ○ Yes
Complex	○ No ◉ Yes
Quantity	1
Drug	Triomune-30 ▾

[Save Order]

Drug order

Drugs

▶ Different branded drugs may have the same active ingredient, e.g.
  ◦ **Paracetamol** – Panadol, Tylenol, Calpol, etc

Paracetamol

Drugs in OpenMRS

▸ The **active ingredient** or **generic drug** is stored as a `Concept` in OpenMRS

▸ Each **different brand** is then stored as a different `Drug` entry

Paracetamol

Concept

Drug

Drug

Drug

Example: Triomune-30

Concept Drug Management

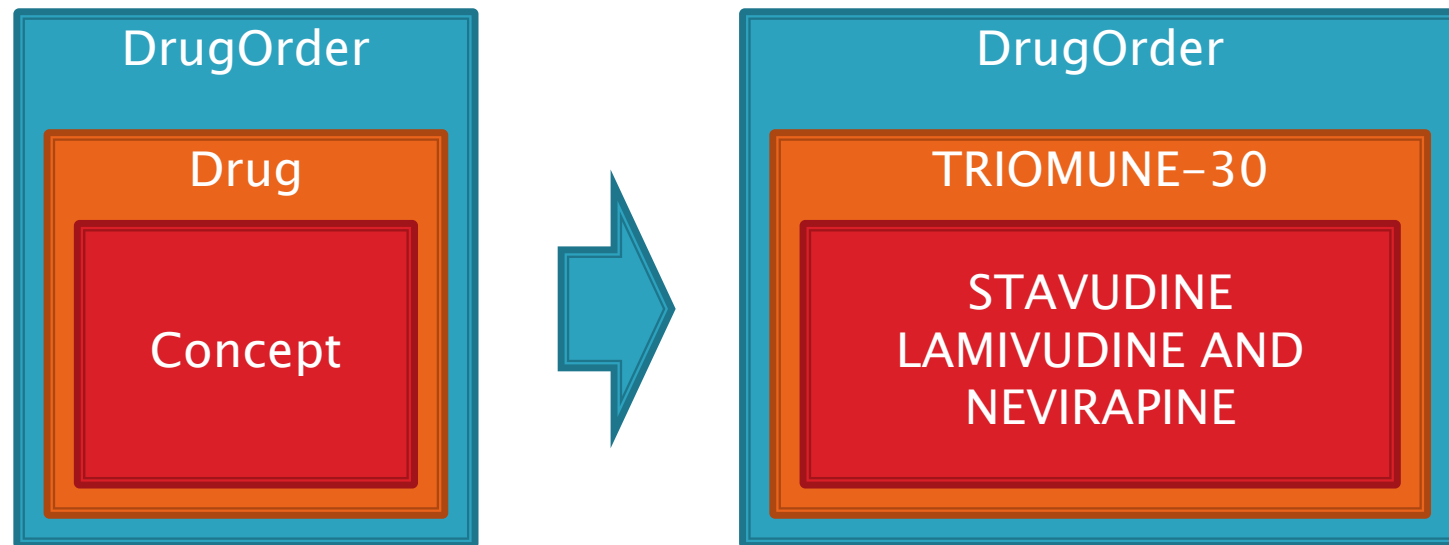|	
Name	Triomune-30
Concept	STAVUDINE LAMIVUDINE AND NEVIRAPINE [Change]
Combination	☑
Dose Strength	
Units	mg
Minimum Dose	
Maximum Dose	
Retired	☐
Created By	Super User - 24-Feb-2005

[Save Concept Drug] [Cancel]

The brand (DRUG)

The active ingredients (CONCEPT)

Important information about the drug

Drug orders

▸ Thus a drug order contains a drug, which contains a concept…

Classes: Order

- This is used to hold orders of type "Lab test"

- Is the base class of `DrugOrder`...

```
class Order {
  private Patient patient;
  private OrderType orderType;
  private Concept concept;
  private String instructions;
  private Date startDate;
  private Date autoExpireDate;
  private Encounter encounter;
  private User orderer;
  private Boolean discontinued
  private User discontinuedBy;
  private Date discontinuedDate;
  private Concept discontinuedReason;
  private String accessionNumber;
  ...
}
```

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Classes: DrugOrder

- This is used to hold orders of type "Drug order"

```
class DrugOrder extends Order {
  private Double dose;
  private Double equivalentDailyDose;
  private String units;
  private String frequency;
  private Boolean prn;
  private Boolean complex;
  private Integer quantity;
  private Drug drug;
  ...
}
```

Finding drugs

- Drugs are accessed via the concept service
  - By drug name...

```
Drug drug =
    Context.getConceptService().getDrug("Triomune-30");
```

  - By concept...

Concept id for STAVUDINE
LAMIVUDINE AND NEVIRAPINE

```
Concept cpt =
    Context.getConceptService().getConcept(792);

List<Drug> drugs =
    Context.getConceptService().getDrugsByConcept(cpt);
```

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Creating a drug order...

```
DrugOrder drugOrder = new DrugOrder();

drugOrder.setOrderType(drugOrderType);
drugOrder.setPatient(patient);
drugOrder.setStartDate(startDate);
drugOrder.setAutoExpireDate(stopDate);
drugOrder.setConcept(concept);


drugOrder.setDrug(drug);
drugOrder.setDose(dosage);
drugOrder.setFrequency(frequency)
drugOrder.setUnits(units);
```

General order properties

Drug order properties

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Order service examples

- To create a new order, use…

```
Order order = new Order();
...
Context.getOrderService().saveOrder(order);
```

- To get all the orders for a specific patient, use…

```
Patient patient = ...

List<Order> orders = Context.getOrderService().
    getOrdersByPatient(patient);
```

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Regimens

- Drugs are often prescribed to a patient in a regimen of multiple drugs
- Unfortunately OpenMRS core doesn't currently have a way to model such a regimen

- But...

Regimen module

- Works by examining the start and end dates of a patient drug orders
  - Drug orders starting and ending simultaneously are consider part of the same regimen
- Usable by other modules as a library