

# Deciding on Clinical Decision Support

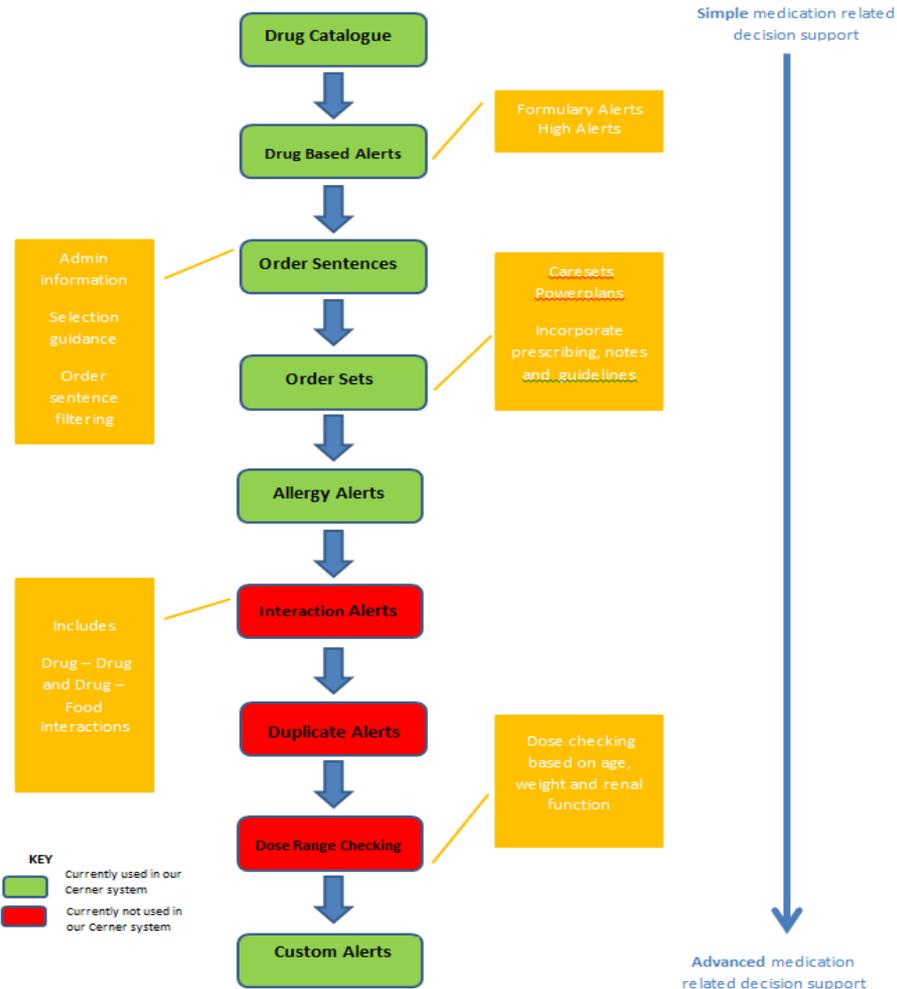
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# Background

- 6 month roll out of ePMA across 5 hospital sites in adult inpatient and outpatient areas starting September 2015
- Paediatrics went live in March 2017
- Implementation of discharge was completed in July 2017
- Generic build across all sites – roll out across the entire Trust was priority
- August 2017 – Optimisation journey begins

# What is clinical decision support?



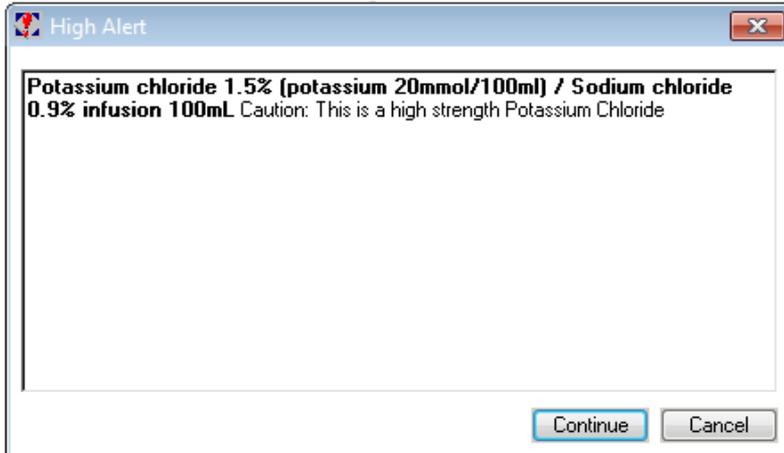
## Drug Catalogue:

This is clinical decision support in its most basic form. The drugs available to prescribe at Imperial College NHS Trust are based on usage and formulary choices.

## Drug alerts:

Any non-formulary medications prescribed are presented with a non-formulary pop up alert which encourage the user to review their choice.

High alerts can be used to highlight high risk medications at the point of prescribing. A pop will appear upon drug selection where a message can be displayed. NPSA alerts have been incorporated as high alerts where possible.



-  High Alert Potassium chloride 1.5% (potassium 20mmol/100ml) / Sodium chloride 0.9% infusion 100mL
-  High Alert Potassium chloride 15% (20mmol/10mL) solution for injection
-  High Alert Potassium chloride 15% (20mmol/10mL) solution for injection FETAL CARE ONLY
-  High Alert Potassium chloride 3% (potassium 40mmol/100ml) / Sodium chloride 0.9% infusion 100mL
-  High Alert Potassium phosphate 17.42% (potassium 20mmol/10ml) solution for infusion

## Order sentences:

Additional information can be added in **‘comments’** or **‘special administration instructions’**. Aimed at providing nursing staff with additional information to aid medication administration.

Special admin instructions have been pre-populated for many medications to match BNF warnings.

Tamsulosin oral, modified-release capsule, 400 micrograms, once a day, Start date: 29/Nov/16 08:00:00 GMT, swallow whole		400 micrograms Not previously given
Tamsulosin		
Self administration		

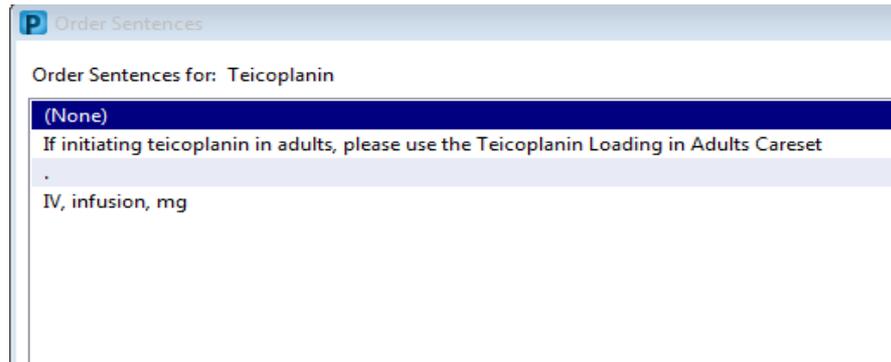
Order comments have also be pre-populated for some medications. Order comments are used we there is a large amount of information required to aid drug administration. For example: Insulin intravenous variable rate infusions:

Insulin soluble human (Insulin intravenous infusion - variable rate) as per Intravenous Insulin Regime (see comments), IV, every hour, 28/Nov/16 12:00:00 GMT	Insulin Regime
Variable Rate Intravenous Insulin Infusion (VRIII) - formerly intravenous sliding scale insulin	Not previously given
Insulin soluble human	
Self administration	
Syringe change	
POCT Glucose	

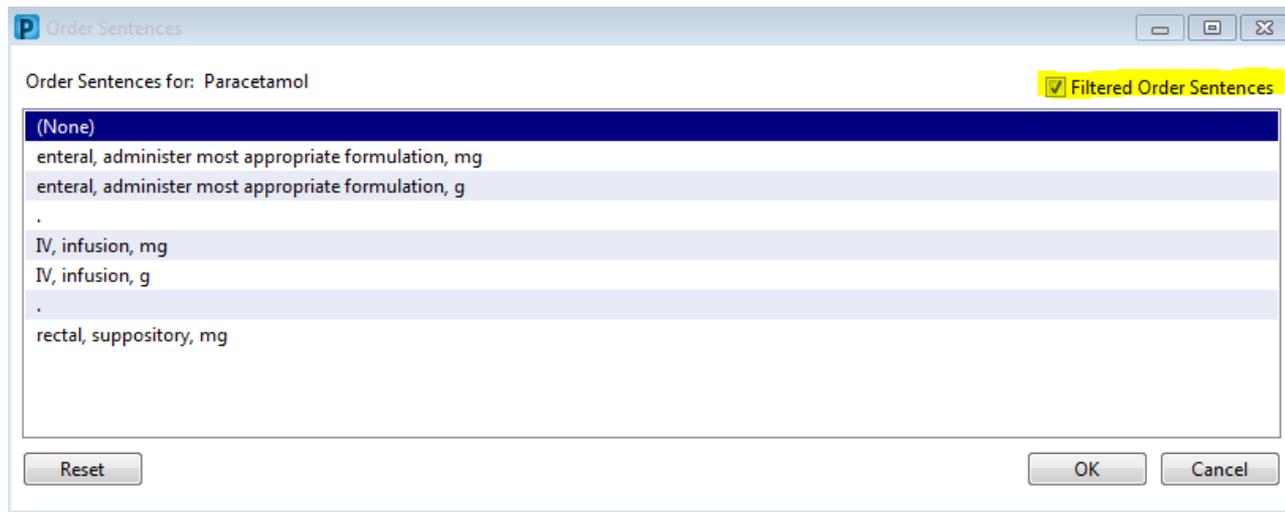
Order comments can be viewed by hovering over the medication on the drug administration page.

27 November 2016 11:43 GMT - 29 November 2016 18:00:00 GMT					
Medication	28/Nov/16	28/Nov/16	28/Nov/16	28/Nov/16	28/Nov/16
Insulin soluble human (Insulin intravenous infusion - variable rate) - Actrapid 50 units in 50ml sodium chloride 0.9%				10 GMT	18:00
as per Intravenous Insulin Regime (see comments), IV, every hour, 28/Nov/16 12:00:00 GMT					
Variable Rate Intravenous Insulin Infusion (VRIII) - formerly intravenous sliding scale insulin					
Capillary blood glucose (mmol/L)					
Infusion rate (units/hr)					
3.9 - 4.9					
5.0 - 7.9					
8.0 - 11.9					
12.0 - 15.9					
16.0 - 19.9					
more than or equal to 20			6 - 8		
Aim for capillary blood glucose levels of 6 - 10mmol/L. If the glucose is greater than 20mmol/L for 2 hours contact medical staff. Infusion rates should be reviewed daily and altered according to glycaemic control.					500
Refer to the Diabetes and Surgical guideline attached for information regarding additional IV fluids and frequency of glucose monitoring.					Last given 500 mg 25/Nov/15:28 GMT
Continue long acting SC insulin for patients with T1DM whilst on VRIII or FRIII					
Review need for IV insulin at least every 24h; refer patients requiring IV insulin for more than 48h to the Diabetes Team using the Think Glucose criteria					
Transition from IV insulin to usual diabetes therapy: IV insulin only remains active for 5-10 mins. Refer to the Diabetes and Surgical guideline Ensure patient has adequate dietary intake, consider dose reduction if this is less than pre-morbid state.					
Insulin/Titratable					

Within the order sentence box **dummy order sentences** can be created to aid selection.



**Order sentence filtering** is also used to provide targeted clinical decision support depending on the patient's age or weight



## Caresets/ Powerplans:

A **care set** or **power plan** allows for a multiple orders to be signed at one time. This functionality also allows for additional notes and guidelines to be incorporated to guide the user in medication order selection.

Tuberculosis Drug Resistant Medication Adult Inpatient, Tuberculosis Drug Resistant Medication Adult Inpatient (Planned Pending)		
4 Medications		
Link to TB Drug Monograph website: <a href="http://www.tbdrugmonographs.co.uk">http://www.tbdrugmonographs.co.uk</a>		
Second Line ORAL Tuberculosis Therapy		
Select those that apply		
Group A		
<input type="checkbox"/>	<input checked="" type="checkbox"/> Levofloxacin	oral, tablet, mg, twice a day, Review date: T+7;N, swallow whole, avoid indigestion remedies, iron and zinc 2 hours before and 2 hours after, for MDR-TB
<input type="checkbox"/>	<input checked="" type="checkbox"/> Moxifloxacin	oral, tablet, 400 mg, once a day, Review date: T+7;N, avoid indigestion remedies, iron and zinc 2 hours before and 2 hours after, for MDR-TB
Group B		
<input type="checkbox"/>	<input checked="" type="checkbox"/>  High Alert Amikacin	IV, infusion, mg, every twenty four hours, Infuse over 60 minute(s), Review date: T+7;N, Take a trough level immediately before the second dose. Aim for trough level <5mg/L, for MDR-TB
<input type="checkbox"/>	<input checked="" type="checkbox"/> Capreomycin	IV/IM, injection, mg, every twenty four hours, Review date: T+7;N, for MDR-TB
Group C		
<input type="checkbox"/>	<input checked="" type="checkbox"/> Clofazimine	oral, capsule, mg, once a day, Review date: T+7;N, with/after food, this medicine may colour your urine, for MDR-TB
<input type="checkbox"/>	<input checked="" type="checkbox"/> cycloSERINE	oral, capsule, mg, once a day, Review date: T+7;N, for MDR-TB
<input type="checkbox"/>	<input checked="" type="checkbox"/> Linezolid	oral, tablet, 600 mg, once a day, Review date: T+7;N, for MDR-TB
<input type="checkbox"/>	<input checked="" type="checkbox"/> Protionamide	oral, tablet, mg, once a day, Review date: T+7;N, swallow whole, with/after food, for MDR-TB
First Line Drugs incorporated into MDR regimes		

# Multum decision support

Includes allergy checking, duplicate checking, and drug - drug interaction checking

The new order has created the following alerts:

Simvastatin (Simvastatin 10mg tablets)

**Severity class**

**Interaction information: pharmacology and management**

Severity	Substance	Details	Status	Interaction Information	Reference Information	Override Reason
Severe	Simvastatin (Simvastatin 10mg tablets)	240 mg, oral, twice a day	Ordered	simvastatin-diltiazem		
Severe	Simvastatin (Simvastatin 10mg tablets)	62.5 mg, oral, twice a day	Ordered	simvastatin-bosentan		
Severe	Bosentan (Bosentan 125mg tablets)	125 mg, oral, once a day	Ordered	simvastatin-bosentan		
Severe	Bosentan (Bosentan 125mg tablets)	125 mg, oral, twice a day	Ordered	simvastatin-bosentan		
Severe	Omeprazole (Omeprazole 20mg gastro-resistant ...)	40 mg, oral, once a day	Ordered	simvastatin-omeprazole		
Severe	Omeprazole (Omeprazole 20mg gastro-resistant ...)	20 mg, oral, once a day	Ordered	simvastatin-omeprazole		
Severe	Ticlopidine (Ticlopidine 300mg/150mg/300mg tablets)	1 tablet(s), oral, twice a day	Ordered	simvastatin-zidovudine		
Severe	Albiretinon (Albiretinon 10mg capsules)	10 mg, oral, once a day	Ordered	simvastatin-albiretinon		
Severe	Warfarin	1 mg, oral, every evening at 6pm	Ordered	simvastatin-warfarin		

**Drugs causing interaction**

Severity	Substance	Details	Status	Interaction Information	Reference Information	Override Reason
Severe	Simvastatin (Simvastatin 10mg tablets)	10 mg, oral, once a day, at bedtime	Ordered	simvastatin-simvastatin		
Severe	Simvastatin (Simvastatin 10mg tablets)	10 mg, oral, once a day, at bedtime	Ordered	simvastatin-simvastatin		
Severe	Simvastatin (Simvastatin 80mg tablets)	80 mg, oral, once a day, at bedtime	Ordered	simvastatin-simvastatin		

Size Columns to Window

Apply to all interactions  Apply only to required interactions

Override Reason: [Dropdown]

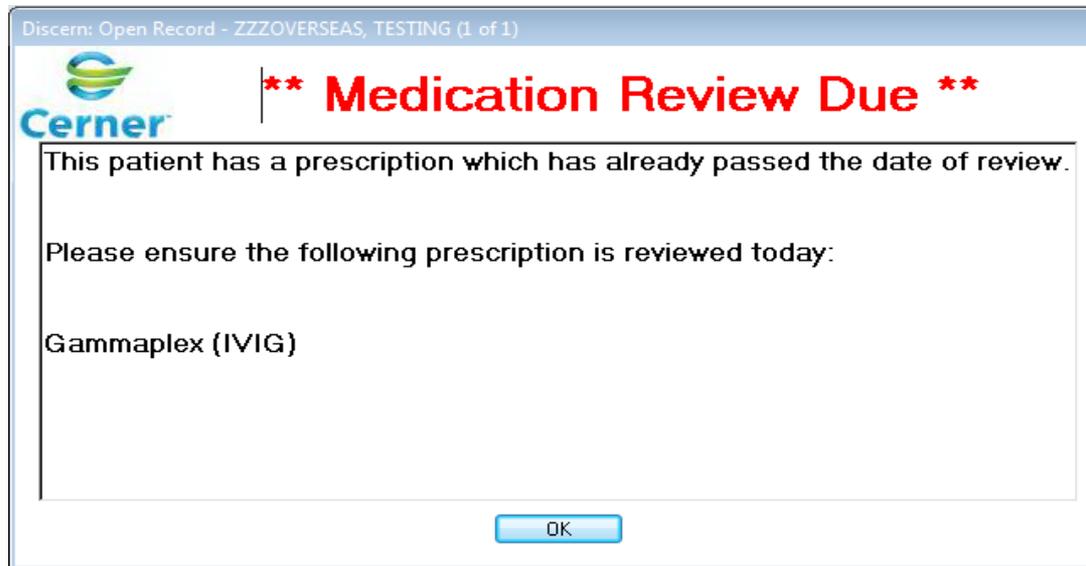
ZZZMEDSTEST, PAYAL - 3679 [Continue] [Remove New Order]

Figure 1: Overview of pros and cons of decision support

Pros	Cons
Instant allergy checking by class	Decision support is attached to the drug chemical (Primary). Therefore if a new primary is created which does not exist in the <u>Multum</u> drug catalogue this will not have any decision support attached until a <u>Multum</u> update is carried out.* Current medicines that do not have a primary include all PGDs, <u>Fidaxomycin</u> and <u>Artenusate</u> **.  Turning on all levels of decision support can cause alert fatigue –with little or no attention paid to important allergy/interaction warnings  Junior medical/pharmacy staff may read too much into interaction warnings if all are made active.  The decision support catalogue currently has 12,211 interactions listed in the ‘Major’ category, 77,440 in the moderate category and 7598 in the mild category.  In <u>Pharmmed</u> manager, even if interaction warnings are switched off, a column with warning symbols remains which can only be ‘hidden’ by individual user preferences.
Provides a double check for interactions and allergies on very busy screens	
Three types of interactions can be detected: drug-drug, drug-food & duplicate prescribing	
The level of interaction severity switched on can be customised	
Interaction checking maybe useful for specialist drugs such as HIV medicines and drugs which are new to the market	
Decision support also allows for interaction checking for drugs that have been discontinued within 24 hours. This is a preference and can be turned off if it is not required.	
Available in both <u>Powerchart</u> and <u>Pharmmed</u> manager	

## Custom alerts

An **EKM rule** can be created to pop up at the point of opening a patient's record or signing an order. The example below is an EKM rule alert. These can be targeted at all users, particular positions and can be associated with a form to capture more information



# Considerations

- Is the clinical decision support request required? Will it prevent clinical risk?
- Is an alert necessary? Can the same message be delivered in an alternative way?
- How can the information be best targeted without causing unnecessary interruption?
- Many requests are in the form of an alert being added to a particular medication. There are various methods of delivering clinical decision support in the form of order sets, documentation and templates that may be more effective than those that interrupt the workflow.
- It is important to deliver clinical decision support involving interruptions to workflows to those that are most appropriate given the context.
- Alternative options should be considered before agreeing an alert should be created within the electronic system.

# Considerations

- Is the request technically possible?
- What are the likely unintended consequences of implementing the alert?
  - a) Alert fatigue
  - b) Prevent prescribing in a timely manner
  - c) Block to access patients record
  - d) Is there a risk that information is provided for some medications and not others which may lead to clinical risk for other medications?
- Is there the ability to keep content current?
- As the amount of content increases, keeping the system up to date becomes increasingly difficult.

# Requests for Decision Support

- Requests for caresets, powerplans, changes existing alerts and workflows
- Parkinsons meds – order sentence to include ‘Must be given on time’
- Stopping this infusion may cause cardiac arrest
- Quinolones may cause tendon rupture
- Palonosetron should not be used with ondasteron
- Removal of ‘Sulfur’ allergies from drug allergy database
- Valproate rule to prompt review in female patients of child bearing potential

# Governance

- A designated committee is required to review incoming requests
- This may be the Drugs & Therapeutics committee, Medication Safety committee or create a new subcommittee if necessary
- Main consideration is whether the existing groups have the required representation to make system related decisions.

Thank you

Any Questions?