Rule Breaking

Andrew Heed

Chief Pharmacy Informatics Officer

The Newcastle upon Tyne Hospitals NHS Foundation Trust

Session contents

- Overview of rule build and design principles.
- Developing an interaction rule
- Issues with rules
- Sample governance processes
- WARNING:
  - Largely Cerner based but transferable.
  - Deliberately contains gobbledygook.

How it starts

• The clinical team

"Can we have an interaction rule for statins and stuff?"

How it starts

- The Informatics team

"Yeah no problem!"

How it ends

Cerner | **MAJOR Atorvastatin and Ciclosporin Inter**

There is a significant interaction between Atorvastatin and CicloSPORIN

Concurrent use increases plasma levels of Atorvastatin, which can lead to myopathy / rhabdomyolysis, which can be fatal. For more information click Here

When prescribed with CicloSPORIN the maximum dose of Atorvastatin is 10 mg daily.

This alert will cancel this order a lower dose of Atorvastatin can be ordered below.

Add Order For:

☐ Atorvastatin -> DOSE: 10 mg, oral, NOCTE

OK

It is all very simple!

Cerner Term	
Evoke	The high level trigger
Logic	The fine details
Action	The response

Until it becomes complex

- All about the details . . .
  - What specifically does the rule require?
  - What should the rule do?
  - When should it do it?
  - Who for?
- How will the rule be maintained?
- Is there a better way to do it?

Breaking Rules - When

- Evoke actions:
  - OpenChart
  - Add to scratchpad
    - Order? resume? cancel
  - Sign order
  - Clinical event
- Details:
  - Which applications?
  - Who?

Revision of ePx
Log on to system.
Access patient's record
Search for drug(s) or set(s) or plan(s)
Select from above
Select order details.
Review
Sign
Review
Exit patient's record

Rule Breaking - Why

- Logic section:
  - Incoming order, results
    - Type, dose, route, value, status
  - Previous order, result(s)
    - When, how long ago, this admission?
  - Demographics
    - Gender, age, location
  - Evaluation *(weekday (curdate) =0 or weekday (curdate) =6) or (curtime < 0800 or curtime > 1900)*
  - Calculation

Rule breaking - What

- Actions:
  - Pop-up – instant vs delayed, block, inform,
  - Messages – who to? Data governance
  - Maintain orders e.g. referral
  - Maintain results
  - Secondary rule
  - Action groups

Design principles

- Manageable chunks
- Many simple rules vs Fewer Complex rules
- Develop in de-bug mode.
- Build in small pieces and test as you go.
- Develop template rules with consistent:
  - Nomenclature
  - inclusion / exclusion processes
  - Build sequence

The same interaction 3 ways
(Statin + Ciclosporin)

Rule 1 . Simple pop-up rule	
Evoke:	Add to scratch pad or sign order Incoming order is a statin. Not ordered by pharmacy
Logic:	Incoming order is a statin Active orders exist for Ciclosporin.
Action:	Single pop-up message Default to cancel order?
Comments	Needs a co-rule for incoming Ciclosporin. Same action for all statins

Rule 2. Variable pop-up rule	
Evoke:	Addtoscratchpad or Sign order Incoming order is a statin or ciclosporin. Not ordered by pharmacy

Logic:	Incoming order is either:
	    1) Rosuvastatin, Pravastatin, Simvastatin
	    2) Atorvastatin dose >10mg
	    3) Ciclosporin

	Active orders exist for either:
	    4) Rosuvastatin, Pravastatin, Simvastatin
	    5) Atorvastatin dose >10mg
	    6) Ciclosporin.

Action Group(s)	Four different pop-up messages if
	    1 and 6, 3 and 4 = Cancel statin
	    2 and 6, 3 and 5 = cancel and prompt 10mg atorvastatin

Comments	Handles atorvastatin Requires paediatric version allowing pravastatin. Signorder option allows rule on resume

Rule 3: Referral to pharmacy, no pop-up for prescriber	
Evoke:	Sign order. Incoming order is a statin or ciclosporin. Not ordered by pharmacy

Logic:	Incoming order is:
	    (Rosuvastatin, Pravastatin, Simvastatin, Atorvastatin
	    And an active order exists for Ciclosporin.)
	    Or
	    (Ciclosporin
	    And an active order exists for Rosuvastatin, Pravastatin, Simvastatin, Atorvastatin)

Action	Generates Pharmacy referral and task for Statin / Ciclosporin review. Creates a specific pharmacy priority score. Recalculates overall priority score
Comments	Requires co-rule to readjust priority score when task is completed.

Design Complexities

- Multiple systems.
- Synchronous vs Asynchronous.
- Substitution values.
- Numeric maths vs decimal point maths.
- Scope of EPR deployment.
- Do you really want to put an absolute block on something?

Maintenance Complexities

- Over-lapping rules.
- Changes in:
  - User positions.
  - Templates.
  - Hyperlinks.
  - Drug catalogue.
- Experience tends to "Orange Juice."

Current NUTH Governance

- All Requests reviewed by Med safety Working group (MSWG)
- Pro-forma to define the rule contents.
- Estimate of build time.
- Build / test in path to production
- Log development time
- Advise audit and review process.

Development time estimate NUTH

- Based on pharmacy prioritisation work.
- And assuming:
  - 3 domain path to live
  - change control.
  - Testing.
  - Fully defined
- Simple order or clinical event rule 3 days
- Clinical event and order rule e.g. TDM 6 days
- Interaction 9 days

Have you got the resources to do this?