Why a Clinical Rules Engine?

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The speaker has no conflict to disclose.

Huntsville Hospital

- 881 Licensed Beds
- Two main buildings – Main Hospital (Adult side) and the Women's and Children's Hospital
- Acute care tertiary community teaching facility
- 21% critical care beds

Department of Pharmacy

- 154 total fte's
  - 8 residents (6 PGY-1 and 2 PGY-2)
  - 18 Clinical Specialists
  - 46 Unit Base Pharmacists
  - 65 Technicians
- Cart-less distribution model – 90 Pyxis mains with 95% first dose dispense rate
- Omnicell PharmacyCentral Carousels in both facilities

Question

- What is a clinical rules engine?
  - A) A set of protocols by which a drug should be used?
  - B) The technical name for the engine in the new Chevrolet Volt
  - C) A set of criteria by which the appropriateness or inappropriateness of a particular situation can be evaluated

What is a “rules” engine

- Simply put, a “rules” engine is a product or process that uses (evaluates) available data against an algorithm (a set of criteria) to identify those sets of data that either meet the specified criteria or does not meet the specified criteria

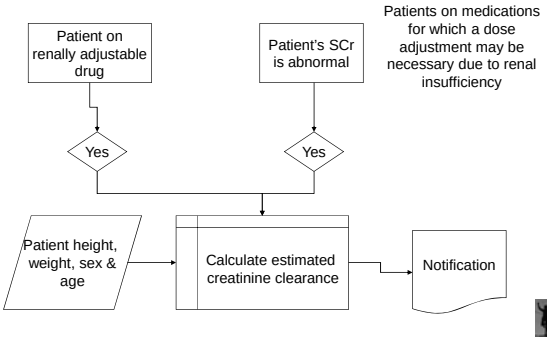
Why a Rules Engine?

- We average over 14,500 active orders daily
- Daily an average of 6,300 new orders are generated
- Over 700 physicians are involved and more than 2,000 nurses
- Over 42,000 discharges, 700 DRG’s and uncountable co-morbidities
- Our formulary encompasses over 3,500 different products
- How else to keep patient medication issues from slipping between the cracks?

Why a Rules Engine

- A rules engine does not get tired
- It never gets bored
- It never misses anything
- It documents EVERYTHING it does
- It offers no opinions
- It is consistent
- It does not forget, and always follows up
- It frees up pharmacist time to focus on the true task of a professional, evaluation and decision making

How does it work?



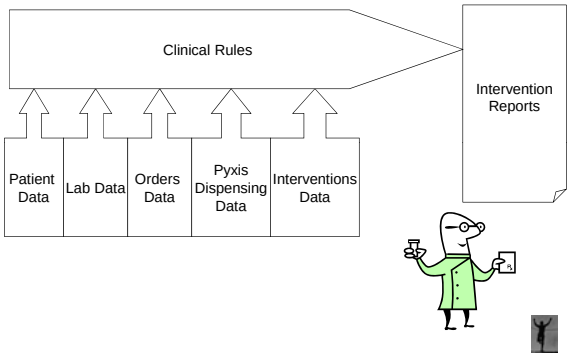
A History Lesson

- And in the beginning
  - Compounding and dispensing
  - 1960's-70's – Beginning of clinical training and practice
  - Paper profiles – Looking for problems
  - Electronic profiles – Looking for problems
  - It was possible to spend more time out of your day looking for clinical issues than dealing with them
  - Who has time for that!

The Evolution of PhRED

- PhRED – Pharmacy Rules Evaluation Database
  - 1.0 - Started out in Dallas as an extract of data from our Cerner Classic system with data fed into a Paradox database
    - IV to PO
    - Duration of Therapy
  - 2.0 – In Tulsa moved to MS Access using data extracted from our PerSE clinical system, included lab data for the first time
    - Same as above
    - Drug Toxicity (Acetaminophen)
    - Drugs given too close in time
    - Renal dose adjustments
  - 3.0 – In Huntsville, using data extracted from our GE Centricity Enterprise system. 20 rules in all.
    - Enhanced to include workload data tracking
    - Included Pyxis Override report

PhRED Data Sources



Time for a Change

- PhRED is homegrown and limited (albeit, pretty powerful too)
- PhRED runs in batch mode – Printing out 500 pages of reports at 7:30am
- Always out of date!
- Hard to get clinical workload accurately documented
- Needed a real time strategy

What to do?

- I was aware of several vendors of clinical rules engines
  - Vigilanz Dynamic Monitoring System – Vigilanz
  - Clinical Xpert - Thomson Reuters
  - MedMined – CareFusion
  - TheraDoc - Hospira
  - Sentri7 – Pharmacy One Source
- We already had several PharmacyOne Source products installed
- Our staff was doing a great job using Quantifi for miscellaneous clinical documentation
- So we evaluated Sentri7 and felt it was a good fit

Current State

Overall Clinical Rules Structure				
GE Centricity Blaze Rules	• GE rules used for concurrent checking of desired circumstances – Presence of INR for new warfarin order – Presence in potassium level WNL for new potassium order – Automatic ordering of labs with orders for certain drugs	PhRED	• Sentri7 used for those items needing a more "real time" approach – Renal alerts – IV to PO – Many of the current PhRED reports • PhRED is reserved for those clinical rules too complex or requiring data not available to the other two rules engines	Sentri7

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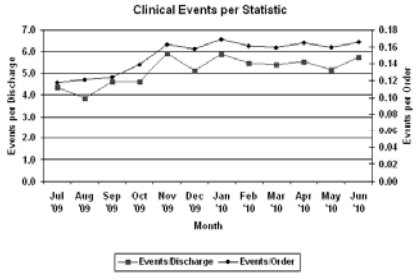

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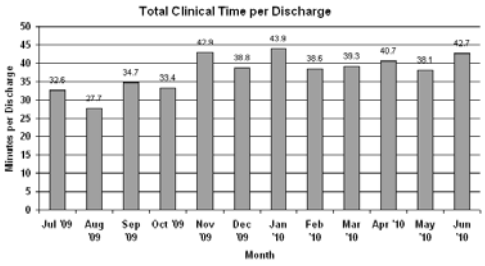

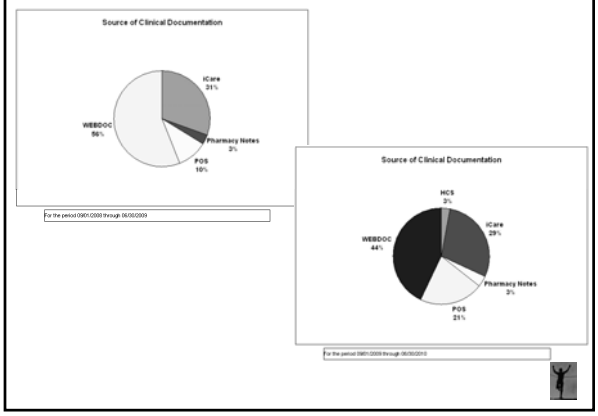

ROI Impact

Changes in Clinical Intervention Patterns

Period	Interventions	Cost Avoidance	Manhours Consumed	Interventions / Manhour
October - February 08	121,990	$ 2,096,075	19,180	6.4
October - June 09	169,174	$ 2,492,430	20,760	8.1
Delta Quanitity	**47,184**	**$ 396,355**	**1,580**	**1.8**
Delta %	**38.7%**	**18.9%**	**8.2%**	**28.1%**
October - June 09	169,174	$ 2,492,430	20,760	8.1
October - June 10	215,179	$ 3,306,353	26,170	8.2
Delta Quantity	**46,005**	**$ 813,923**	**5,410**	**0.1**
Delta %	**27.2%**	**32.7%**	**26.1%**	**0.9%**

- Staff additions have fueled performance increases in the past
- Sentri7 has increase our ability to focus on interventions of value
- Overall performance and documentation of the required effort has increased

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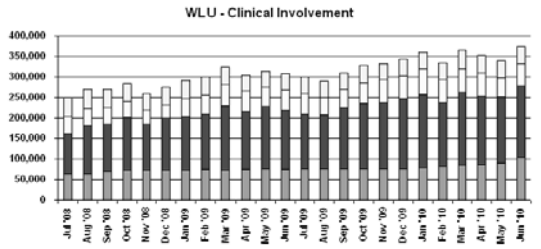

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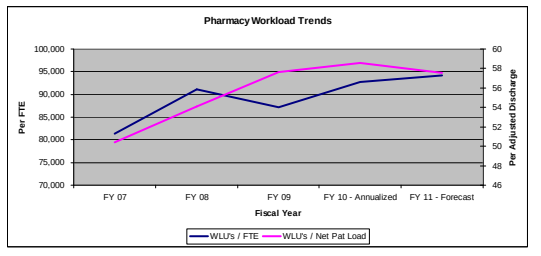

Summary

- Clinical rules are indispensable
- Wisely used they can greatly stretch the abilities of the average pharmacist to make above average “catches” and interventions
- Vastly improves medication issue detection rates
- Helps to document the work done, and the work yet to be done
- No single approach will probably capture all medication process improvement opportunities
- The tools can be used to guide medication process improvement opportunities
- Think OUTSIDE the box!
- Never, ever, leave well enough alone!

ICHP Annual Meeting
McDaniel - Technology for Tomorrow Pearls: Why a Clinical Rules Engine?
121-000-10-046-L04-P
121-000-10-046-L04-T

Post Test Questions

1. Clinical rules systems are beneficial only for larger, more complex clinical environments.
True or False

2. Your best pharmacists don't really need a clinical rules environment to be more productive.
True or False

3. The manual mining of clinical data is an efficient use of a pharmacist's time.
True or False

4. Clinical rules engines enhance patient safety, but don't actually pay for themselves.
True or False

5. What are some reasons why a pharmacy might find a clinical rules engine application useful:

A. Saves pharmacists time in identifying potentially actionable issues
B. Might identify issues the pharmacist might otherwise fail to catch
C. Enables auto-documentation of the number of opportunities that exist for drug therapy improvement
D. All of the above

6. Which of the following approaches to building a multi-modal rules environment are viable:

A. Use of embedded rules built within your clinical environment (proactive)
B. Use of a third party rule system that instantly identifies criteria matches (reactive)
C. Custom applications that deal with issues that are more complex and require custom coding
D. All of the above