CDSS CHANGE IMPACTS PATIENT SAFETY

1 Problem

What	Problem(s)	Missing alert; potential for missed testing
When	Date	November 2009 to February 2013
	Time	N/A
	Different, unusual, unique	Internal code for drug changed
Where	Facility, site	Hospital
	Unit, area, equipment	Clinical decision support system (CDSS)
	Task being performed	Evaluation of patients treated with amiodarone

Impact to the Goals

Patient Safety	Potential for untreated thyroid issues
Patient Services	Potential for missed thyroid testing

Frequency	93% of surveyed Medical Information Officers experienced at least 1 CDSS malfunction

Cause Map

Programming Error Leads to Missed Alert

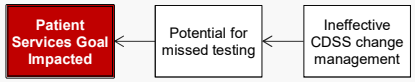
Clinical decision support systems (CDSS) aim to improve health care quality, safety and effectiveness by providing alerts to providers based on criteria (such as identifying drug interactions). However, a malfunctioning CDSS can actually reduce patient safety when physicians rely on these alerts.

"CDSS malfunctions are widespread and often persist for long periods. The failure of alerts to fire is particularly difficult to detect. A range of causes, including changes in codes and fields, software upgrades, inadvertent disabling or editing of rules, and malfunctions of external systems commonly contribute to CDSS malfunctions, and current approaches for preventing and detecting such malfunctions are inadequate."

- Analysis of clinical decision support system malfunctions: a case series and survey
Adam Wright, Thu-Trang T. Hickman, Dustin McEvoy, Skye Aaron, Angela Ai, Jan Marie Andersen, Salman Hussain, Rachel Ramoni, Julie Fiskio, Dean F. Sittig, David W. Bates
Journal of the American Medical Informatics Association Mar 2016, DOI:10.1093/jamia/ocw005

2 Analysis

Basic Level Cause Map - Start with simple Why questions.



Basic Cause-and-Effect

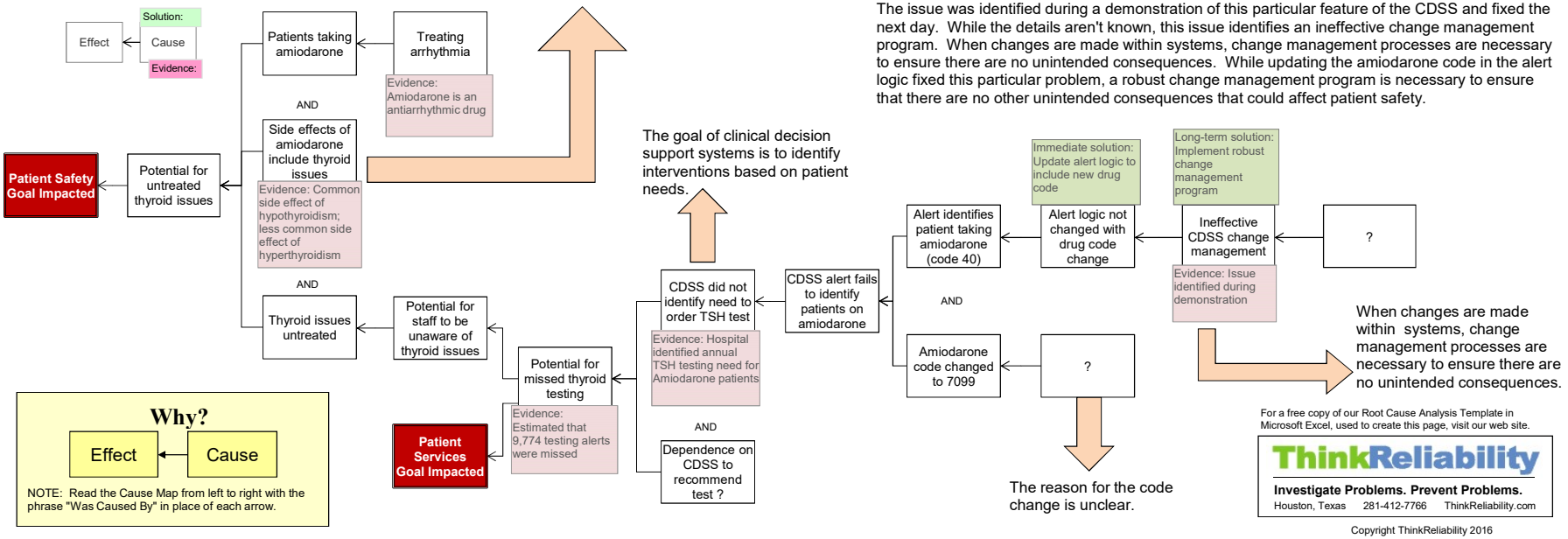
The CDSS malfunction in this case study involved a stopped alert for annual thyroid testing in patients prescribed amiodarone. When the issue was noticed and resolved in February 2013, it was determined that the alert had been stopped since November 2009, when the internal code for the drug amiodarone was changed.

Cause Mapping is a Root Cause Analysis method that captures basic cause-and-effect relationships supported with evidence.

CAUSE MAPPING
Problem Solving • Incident Investigation • Root Cause Analysis

Step 1	Problem	What's the Problem?
Step 2	Analysis	Why did it happen?
Step 3	Solutions	What will be done?

More Detailed Cause Map - Add detail as information becomes available.



Why?

Effect ← Cause

NOTE: Read the Cause Map from left to right with the phrase "Was Caused By" in place of each arrow.

3 Solutions

The issue was identified during a demonstration of this particular feature of the CDSS and fixed the next day. While the details aren't known, this issue identifies an ineffective change management program. When changes are made within systems, change management processes are necessary to ensure there are no unintended consequences. While updating the amiodarone code in the alert logic fixed this particular problem, a robust change management program is necessary to ensure that there are no other unintended consequences that could affect patient safety.

For a free copy of our Root Cause Analysis Template in Microsoft Excel, used to create this page, visit our web site.

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