

# 1 Problem

<b>What</b>	Problem(s)	Patient overexposed to radiation
<b>When</b>	Date	September 14-18, 2015
	Different, unusual, unique	Use of two beams to deliver treatment (1 used more commonly)
<b>Where</b>	Facility, site	Edinburgh, Scotland
	Unit, area, equipment	Cancer Center
	Task being performed	Palliative radiotherapy

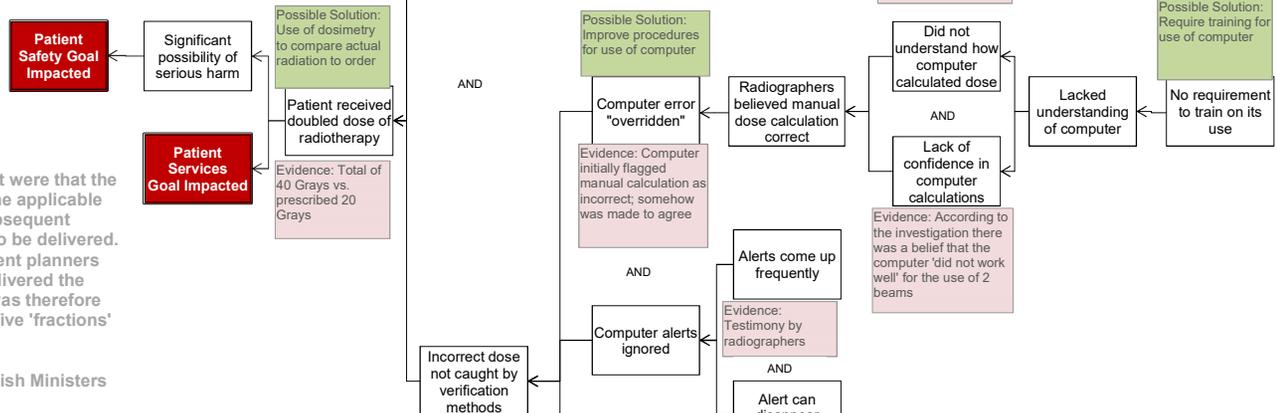
## Impact to the Goals

<b>Patient Safety</b>	Significant possibility of serious harm
<b>Compliance</b>	Report to, investigation by Scottish Ministers
<b>Patient Services</b>	Patient received double dose of radiotherapy
<b>Property/ Equipment</b>	Ongoing support, monitoring
<b>Labor/ Time</b>	

Frequency	10 years since last "serious overexposure" for a patient undergoing radiotherapy in Scotland
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# 2 Analysis

Detailed Cause Map - Add detail as information becomes available.



"The particular circumstances of this Edinburgh incident were that the treatment was properly prescribed in accordance with the applicable ECC treatment protocol, but errors were made in the subsequent process of planning how the prescribed treatment was to be delivered. These errors remained undetected, such that the treatment planners sent the wrong information to the radiographers who delivered the treatment. The setting used on the treatment machine was therefore twice what it should have been, and remained so for all five 'fractions' of the treatment process."

- Dr Arthur M Johnston,  
Warranted Inspector appointed by the Scottish Ministers

# 3 Solutions

As a result of this incident, the inquiry into the error made several recommendations for the treatment plan process to avoid this type of error from recurring. Specifically, the inquiry recommended that the procedure and training for manual calculation be improved, independent verification be performed using a different method, procedures for use of the computer be improved (including required training on its use), and requiring manual calculations to be redone when not in agreement with the computer. All of these solutions reduce the risk of the error occurring.

There is also a recommended solution that doesn't reduce the risk of having an error, but increases the probability of it being caught quickly. This is to outfit patients receiving radiotherapy with a dosimeter so their received dose can be compared with the ordered dose. (In this case, the patient received 5 treatments; had a dosimeter been used and checked the error would likely have been noticed after only one.)

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

### CAUSE MAPPING

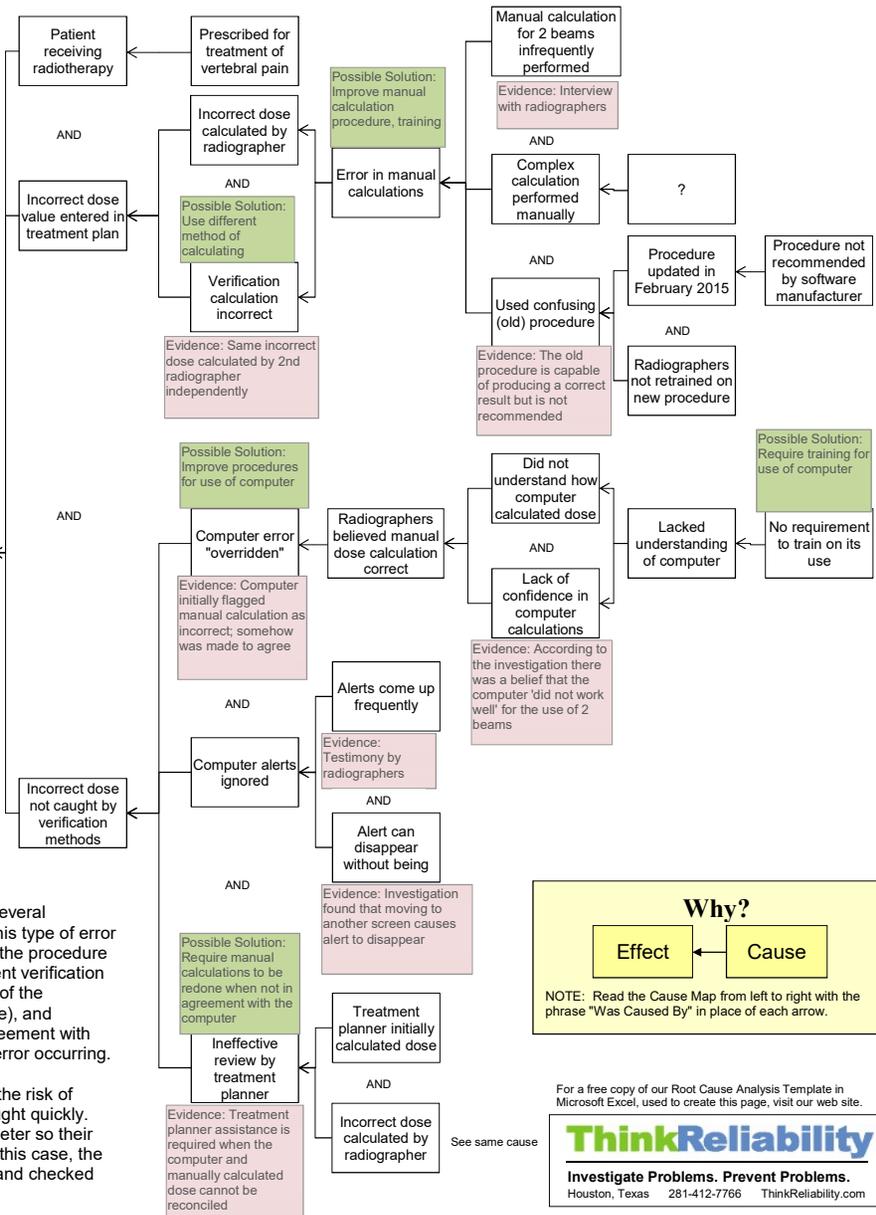
Problem Solving • Incident Investigation • Root Cause Analysis

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

# RADIOTHERAPY OVERDOSE

Cause Map

## Two employees make same mistake in calculations; override computer warning



### Why?

Effect

←

Cause

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

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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