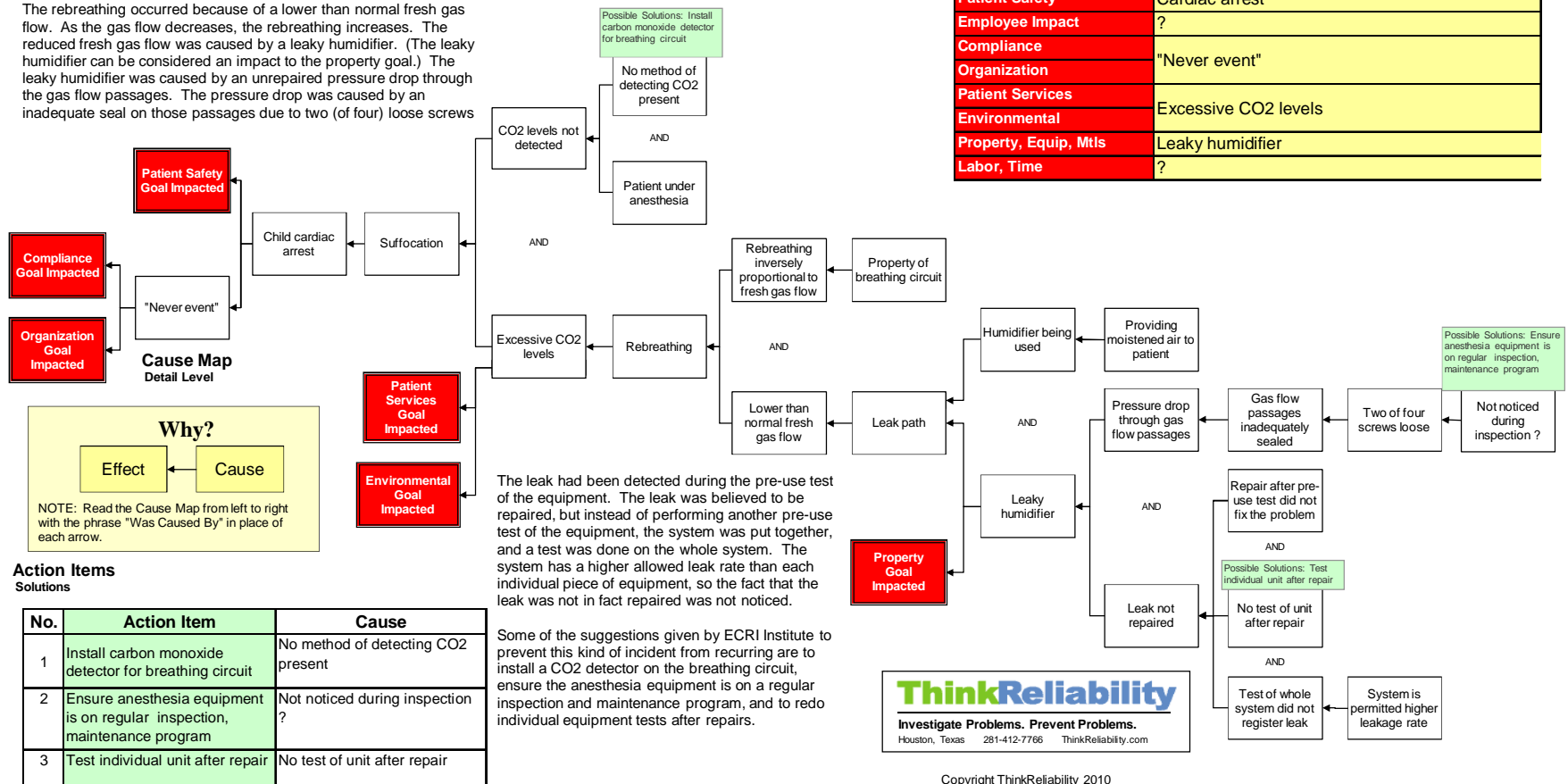


Cardiac Arrest Due to Leaky Equipment

A patient death associated with equipment that does not perform properly is one of the "Never Events" (i.e. events that should never happen). A case where a leaking piece of equipment caused the cardiac arrest of a child is described by the ECRI Institute. We can record this information in a Cause Map, or visual root cause analysis in order to show the relationships between the causes and suggested solutions. The root cause analysis investigation is shown here.

Because a patient suffered cardiac arrest, there was an impact to the patient safety goal. We begin this impacted goal and ask "Why" questions to add more causes to the Cause Map. The cardiac arrest was caused by suffocation. The suffocation was a result of undetected excessive carbon dioxide (CO2) levels. The levels were undetected because the child was under anesthesia (thus making it difficult to judge the breathing air quality) and because there was no device to detect high CO2 levels. The CO2 levels were high due to rebreathing. (The high CO2 levels were an impact to the patient services and environmental goals as well.

The rebreathing occurred because of a lower than normal fresh gas flow. As the gas flow decreases, the rebreathing increases. The reduced fresh gas flow was caused by a leaky humidifier. (The leaky humidifier can be considered an impact to the property goal.) The leaky humidifier was caused by an unrepaired pressure drop through the gas flow passages. The pressure drop was caused by an inadequate seal on those passages due to two (of four) loose screws



Outline

Define the Problem

What
When

Problem(s)
Date
Different, unusual, unique
State, city
Unit, area, equipment
Task being performed

Child cardiac arrest, leaky humidifier
?
Pre-use test discovered leak in vaporizer
?
Mapleson E breathing circuit
Providing air for child under anesthesia

Where

Impact to the Goals

Patient Safety	Cardiac arrest
Employee Impact	?
Compliance	"Never event"
Organization	Excessive CO2 levels
Patient Services	Leaky humidifier
Environmental	?
Property, Equip, Mtls	?
Labor, Time	?