

1 Problem

| Step 1. Define the Problem | | |
|----------------------------|-------------------------|--|
| What | Problem(s) | Reducing bloodstream infections from central line |
| When | Date | Proactive |
| Where | Facility, site | Hospital ICUs, Dialysis Centers |
| | Task being performed | Inserting Central Venous Catheter (CVC), aka Central Line |
| Impact to the Goals | | |
| | Patient Safety | Preventable central line-associated bloodstream infections |
| | Patient Safety | Patient death |
| | Patient Services | Longer hospitalization stay |
| | Property | Potential malpractice suits |
| | Property | Additional cost to treat infection |

CENTRAL LINE INFECTIONS

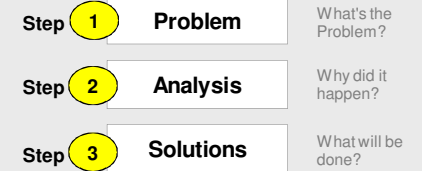
Cause Map Multiple Steps for Prevention

More commonly known as Central Line-associated Bloodstream Infections (CLABSI), central line infections are responsible for tens of thousands of deaths each year and billions of added dollars in healthcare costs. However, they are completely preventable. Multiple health organizations, including the CDC, have developed guidelines to prevent infections due to Central Venous Catheters.

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

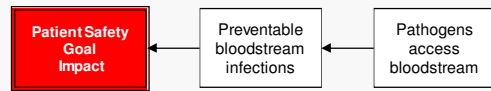
CAUSE MAPPING

Problem Solving • Incident Investigation • Root Cause Analysis



2 Analysis

Basic Level Cause Map - Start with simple Why questions.



Basic Cause-and-Effect

In this health care scenario, patient safety is the foremost concern. So the most basic Cause Map would show that the Patient Safety Goal is impacted by preventable bloodstream infections, and that those infections come from pathogens introduced by a central line. The next step is to elaborate on how pathogens enter the bloodstream, and then determine what appropriate solutions might be.

More Detailed Cause-and-Effect

Preventable bloodstream infections happen because pathogens access the bloodstream but also because the infections aren't treated early on. This suggests that by treating infections early on, and vigilantly watching for signs of infection, more serious infections can be prevented.

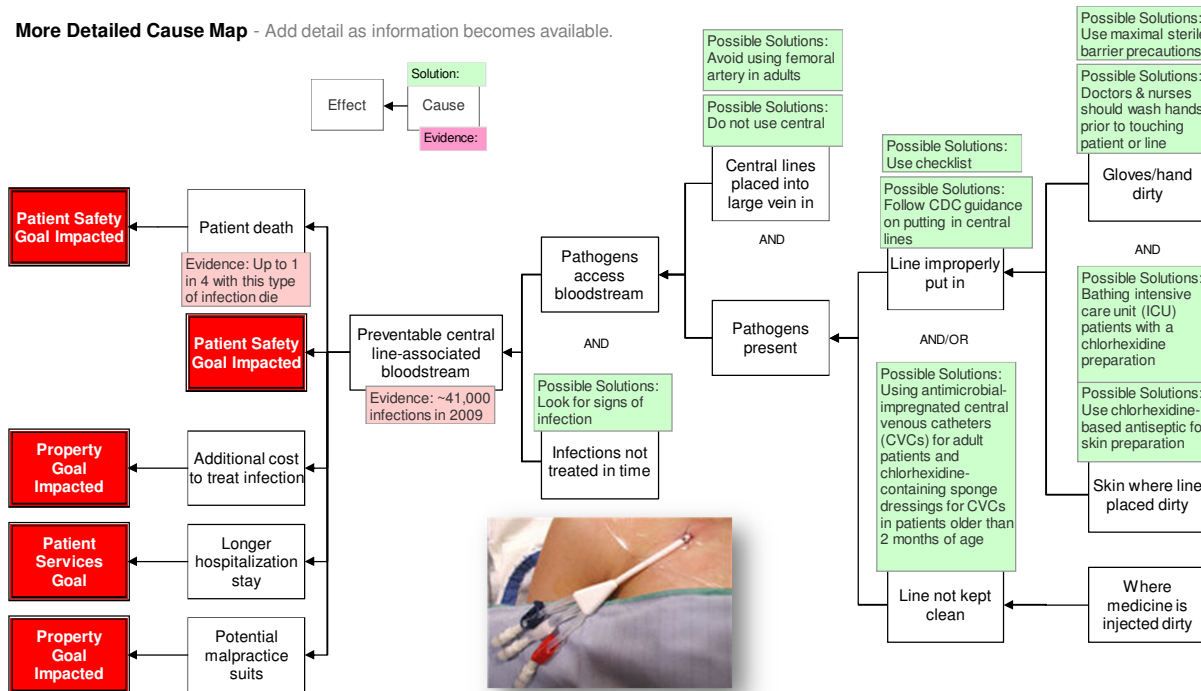
Pathogens can access the bloodstream because a central line provides a direct conduit to the bloodstream and because pathogens are present. Again, while these are obvious statements, they allow the opportunity to develop potential solutions. First, the CDC recommends not using a CVC unless absolutely necessary. Additionally, CVCs shouldn't be placed in the femoral artery in adults because it is associated with greater infection rates and secondary problems such as deep venous thrombosis.

Assuming a central line is necessary; more analysis leads to further solutions that might reduce the presence of pathogens. Pathogens generally come from two sources – the line was improperly put in or somehow the line became contaminated during use. Using antimicrobial materials is one potential way of minimizing contamination.

Looking closer at the uppermost branch - how the line was put in – leads to some insightful solutions. One simple solution recommended by the CDC is to use a checklist and follow their guidance. Checklists are a simple but highly effective way of reducing errors in repetitive processes. There are two major causes in this branch – dirty hands/gloves from the nurse or doctor putting the CVC in the patient and the patient having dirty skin at the site of the CVC.

CDC guidance also recommends using maximal barriers such as masks and gloves and washing your hands. Cleaning the patient's skin with a chlorhexidine-based solution is another important step that can reduce these infections.

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



Courtesy of cdc.gov