1.5.3 Event Tree Analysis

**Event Tree Analysis.** The problem, simply put, is the initiating event in the top-left corner of the figure. This analysis provides a prospective description of events that occur following the inability to locate a bed. The top, "environmental services" locates at a success rate of .75, illustrates a the best-case scenario, and all future events at the top don't occur. Safe care and patient satisfaction is delivered. However, 1 out of 4 times it is estimated environmental services can't locate a bed efficiently. Branches are then formed with successful outcomes at the top, and failures at the bottom. All events are binary, with a predicted rate of occurrence collected from interviews and observations. One can simply read the events, follow the paths, and a resulting probability is formed. Additionally, a description of the outcome is provided. It is important to relate the probabilities to the outcomes and note that typically stress for the patient and/or nurse is the most likely outcome. It is rare that anything terribly serious would transpire from a misplaced bed.

**Background**

Event tree analyses are useful for predicting, with inherent caution, what would happen if an event occurs in a complex, dynamic organization. It has gained popularity through applications in nuclear power plants, aircraft, and chemical plants. Therefore, it is helpful for assessing rare occurrences that can cause catastrophic outcomes. The event tree analysis can be seen as a reaction to a single event, in which all likely results are categorized in a sequential way with binary outcomes (success/failure). Success is viewed as the system's response to mitigating circumstances, whereas failure is considered an aggravating circumstance. Therefore, failures that are followed up by more failures (and so on), lead to potentially catastrophic outcomes. And, successes followed up by success (and so on) lead to more positive outcomes in which damage is limited to the system.

**Method**

Initial interviews and observations led to a system design of bed operations, and possible outcomes from not being able to locate a bed. The probabilities are obtained from minimal data, and best judgment on the part of the investigator. These are by no means scientific, to date, and can be adjusted. The events following the initiating event are important to clearly define and understand in the system. These events...
are also flexible. The outcomes are best judgments by the investigator, and also are flexible to various interpretations and expert clinical judgment. It is suggested that more exact measures be taken to gather data to ensure the probabilities of events are more accurate. Therefore, the outcomes can be better interpreted in terms of better system design.

**Meaning**

The event tree analysis can provide the hospital with valuable scenarios that could happen as a result of not being able to locate a bed. It will provide a new perspective into what missing beds mean to clinicians and patients. Also, acceptable outcomes are quantified so that management can interpret which events cause the most harm and at what level in the event tree. Therefore, steps can be taken to build better safety mechanisms to create higher success rates and lower failure rates.