

## Providing adequate protection from sputum projectiles through the innovation of ProjectShield

### BACKGROUND

Sputum projectiles are hazardous incidents with patients with tracheostomy. They present unique challenges to infection control staff, especially with patients who are known to be infectious – Hepatitis C, HIV, and so on.

Any unsuspecting person within range could be hit with a sputum projectile, but health professionals and nearby patients are more likely targets and therefore are at a greater risk of infection (e.g. Hepatitis C, HIV) from flying sputum. Patients with tracheostomy are themselves at elevated risk for skin breakdown as they tend to soil their clothes with secretions.

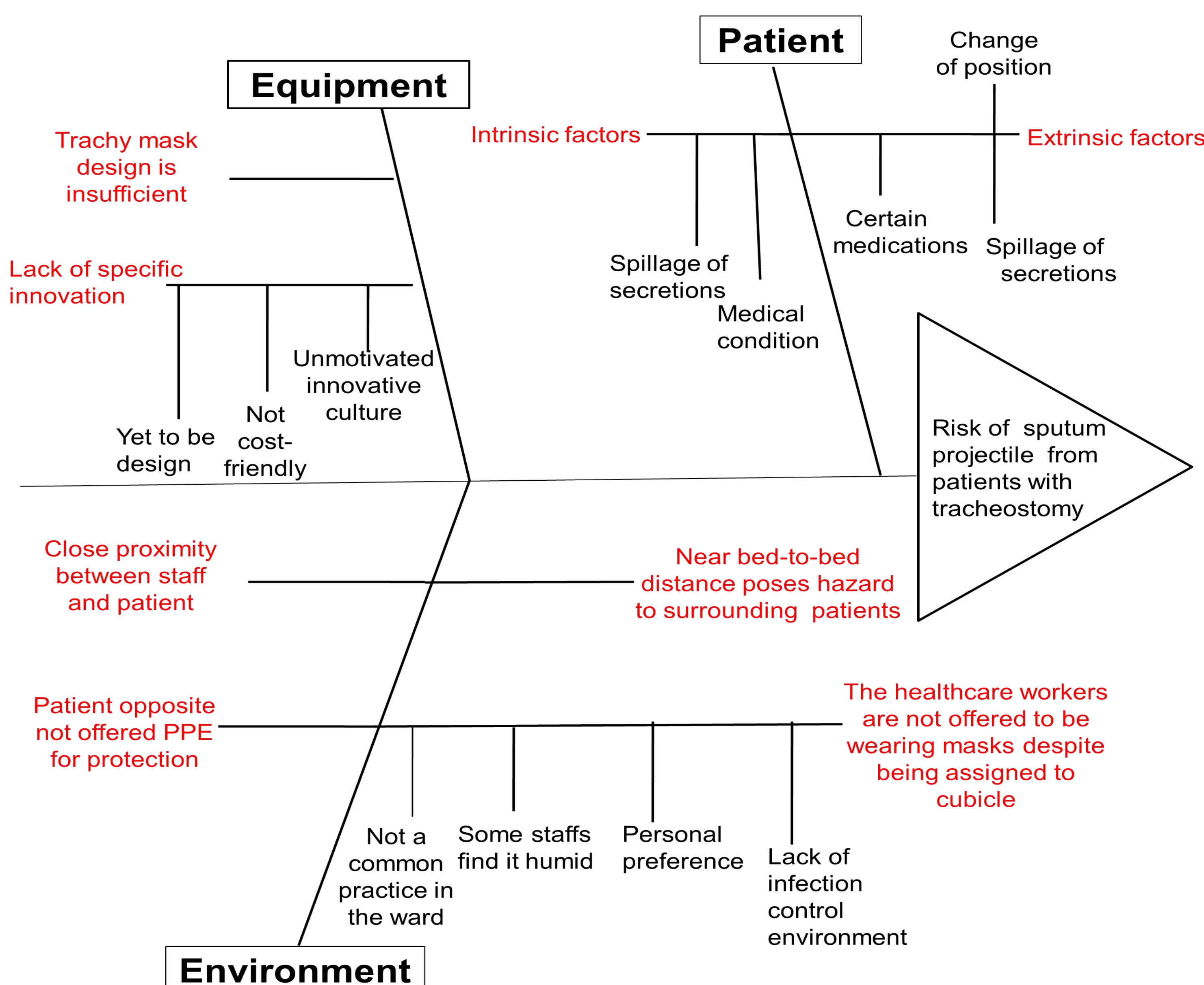
At Bright Vision Hospital (BVH), nurses have tried with some success to deal with this problem with novel ideas such as a Do-It-Yourself flannel and a sputum mask to stop sputum from taking off. We intend to deal with this problem with our own innovative product.

### PROJECT AIM

1. To develop a method that can provide adequate protection from sputum projectiles by effectively preventing tracheostomy secretions from launching and hitting people.
2. The method must also be safe for the patients with tracheostomy.
3. The method must be cost-effective.

### ANALYSIS

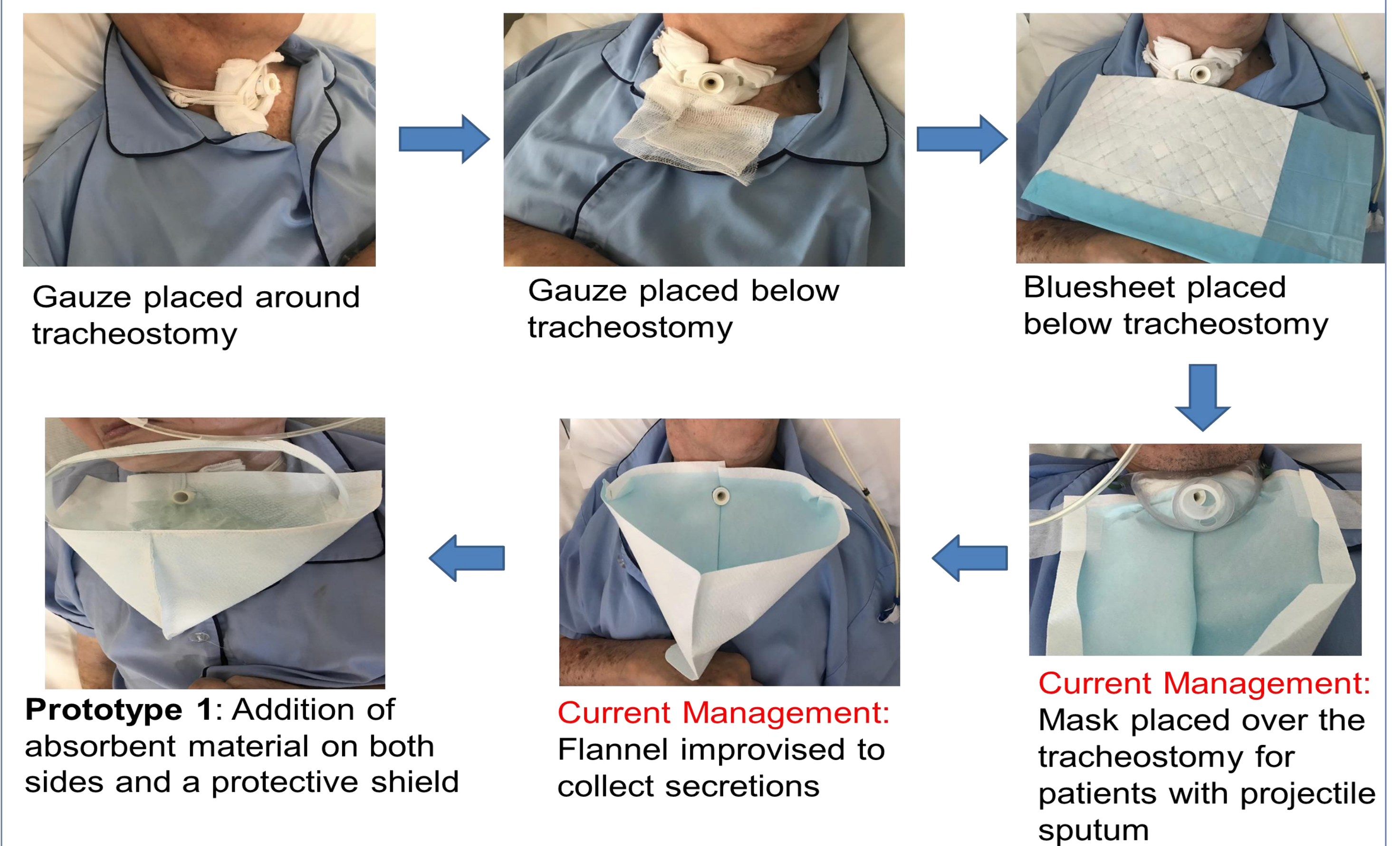
A fish bone cause and effect analysis was done to investigate the risk of sputum projectile from patients with tracheostomy. Following the process of multi-voting, one out of 8 root causes had been shortlisted for innovation. It has been assessed to yield the best results, the greatest reliability and the most promising potential for business investment. Besides containing the risk of sputum projectiles, our product can also minimise soiling of patient's linen and lead to further evolving nursing care for tracheostomy patients worldwide.



### SOLUTIONS

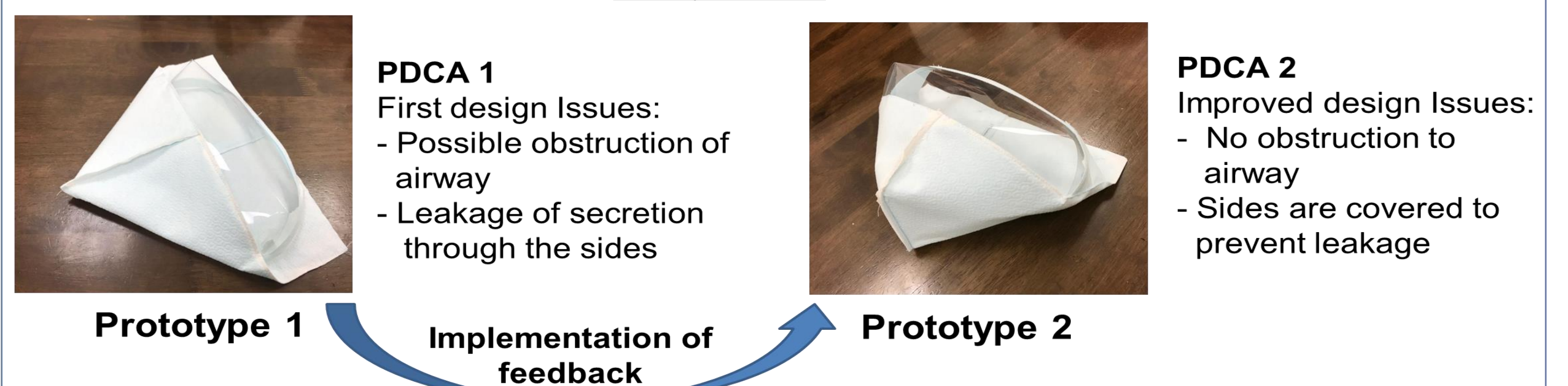
The flow diagram 1 below shows the evolution of methods used in BVH to prevent sputum projectiles. The last picture shows our 1<sup>st</sup> prototype in use.

#### Diagram 1

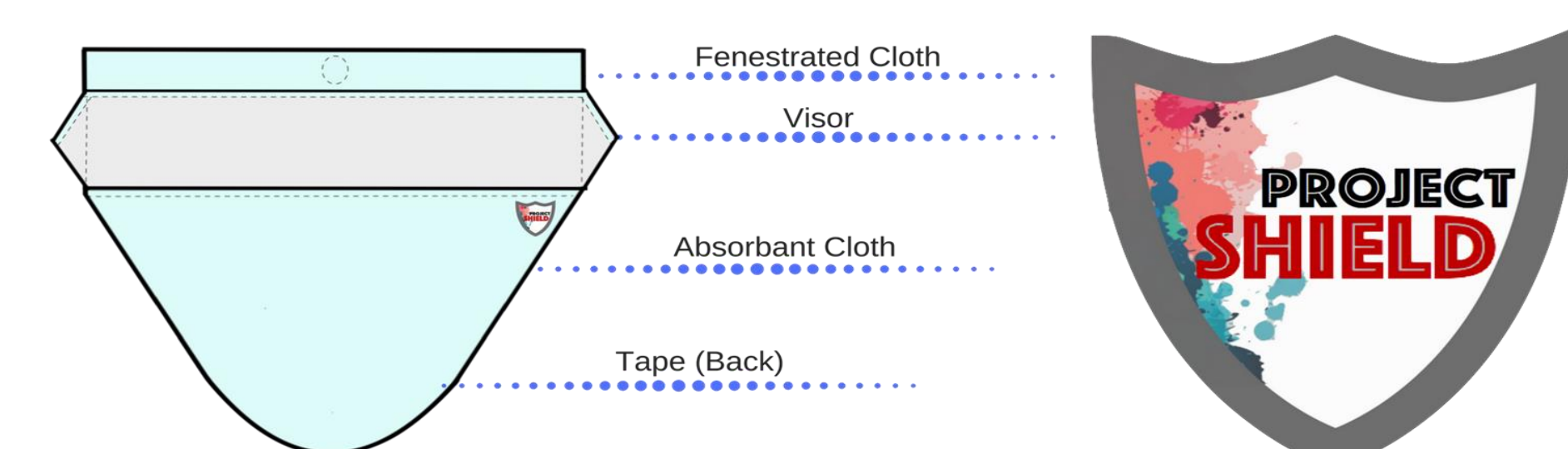


Our first prototype was designed and tested to gather feedback from the nurses in the ward. Feedback was taken into consideration to improve on the second prototype as seen in diagram 2.

#### Diagram 2



We would like to nickname our improved prototype "ProjectShield".



### PROJECT'S IMPACT

A survey was done to gather feedback from 4 staff nurses and 6 enrolled nurses about the prototype, ProjectShield. Below is the summary of what they have said to us:

1. The ProjectShield has proven its effectiveness to prevent sputum from becoming projectiles.
2. It has minimised occurrences of the soiling of patient's linen, and hence frees up more time for nurses to perform other clinical tasks.
3. It is more cost effective than the current method of using trachea-masks.
4. Patient's comfort is increased with the implementation of an absorbent material and integrated shield as compared with the current method.

### SUSTAINABILITY AND SPREAD

ProjectShield was well received by the nurses as it has not only addressed the main challenges faced by nurses, but could also possibly reduce the frequency of changing flannels with the current method.

However, it is too early to tell if ProjectShield will eventually be adopted. More studies will be needed to advance the method and to make it more financially viable.