Choice Architecture:

Transmission-Based Precautions for the 21st Century

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Background

'Choice architecture' is a term used to describe deliberately designing ways in which choices can be presented, without removing options, to alter behaviour positively. We applied these concepts as a framework to improve adherence to standard and transmission-based precautions to reduce the risk of infection transmission.

Intervention

We created a multi-disciplinary working group to review standard and transmission-based precaution procedures. Using the concepts of choice architecture we developed new models of care culminating in a risk assessment tool to guide the selection of personal protective equipment (PPE) (Figure 1). Selection of PPE was risk assessed based on patient care activity, the invasiveness of the procedure and the potential for exposure to body fluid or substance. A new range of precaution signs were subsequently developed providing a precis of the risk assessment tool and a step by step guide on requirements when accessing a patient's room whilst under transmission-based precautions (Figure 2). Also in keeping with concepts of choice architecture we introduced sleeveless aprons in addition to the already available long-sleeved gowns. The aprons were strategically placed in wall dispensers to create readily available PPE stations in all 4 bed bays and outside rooms used for transmission-based precautions.

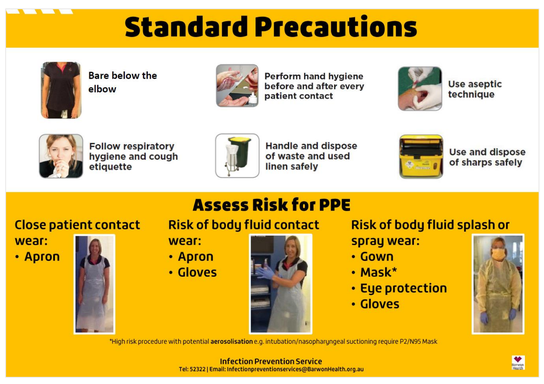
We trialled this intervention on a busy 33 bed General Medical Ward at our large acute regional hospital. The acceptability of these interventions was assessed using an online survey for staff.

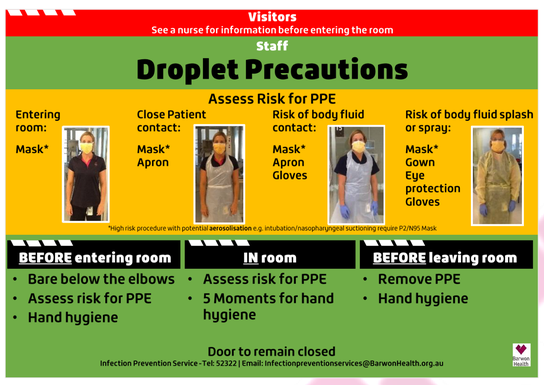
Figure 1 - PPE Risk Assessment Tool

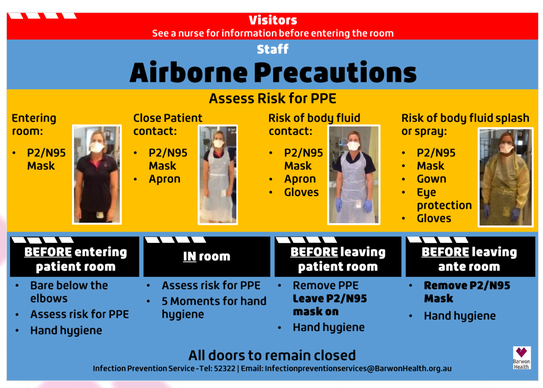
Personal Protective Equipment (PPE) Risk Assessment Matrix

Risk Assessment	Definitions and Examples	Minimum PPE Requirements: Standard	Contact	Droplet	Airborne
Patient and environment contact	General activities and non-invasive procedures: • Non-invasive observations or treatments • Touching invasive medical device connected to the patient • Preparation and administration of oral medications • Food delivery/removal			Surgical Mask	P2/N95 Mask
Close patient contact	Activities requiring close or prolonged body contact and non-invasive procedures: • Personal care activities • Oral care and feeding • Close contact with potentially heavily contaminated patient environment	Apron	Apron	Surgical Mask Apron	P2/N95 Mask Apron
Risk of body fluid exposure	Invasive procedures: • Insertion of an invasive medical device (some aseptic techniques require sterile gloves) • Administration of medications where there is direct contact with a patient's mucous membranes • Any assessment, treatment or patient care where contact is made with non-intact skin Environmental Cleaning	Apron Non-sterile Gloves	Apron Non-sterile gloves	Apron Surgical Mask Non-sterile gloves	Apron P2/N95 Mask Non-sterile gloves
Risk of body fluid splashes or spray	Procedures that potentially generate splashes or sprays of large droplets of blood, body substances, secretions and/or excretions: • Emptying urinary catheter or stoma bags • Emptying or changing wound drains • Nasopharyngeal suction/aspiration • Intubation	Gown (Long Sleeve) Surgical Mask Eye Protection Non-sterile gloves	Gown (Long Sleeve) Surgical Mask Eye Protection Non-sterile gloves	Gown (Long Sleeve) Surgical Mask Eye Protection Non-sterile gloves	Gown (Long Sleeve) P2/N95 Mask Eye Protection Non-sterile gloves
High Risk procedures involving the respiratory tract (including mouth)	High-risk procedures: • Bronchoscopy when the patient's infectious status is unknown • Aerosolisation of particles that may contain specific known pathogens	Gown (Long Sleeve) P2/N95 Mask Eye Protection Non-sterile gloves	Gown (Long Sleeve) P2/N95 Mask Eye Protection Non-sterile gloves	Gown (Long Sleeve) P2/N95 Mask Eye Protection Non-sterile gloves	Gown (Long Sleeve) P2/N95 Mask Eye Protection Non-sterile gloves

Figure 2 - Standard & Transmission-based Precaution Signs



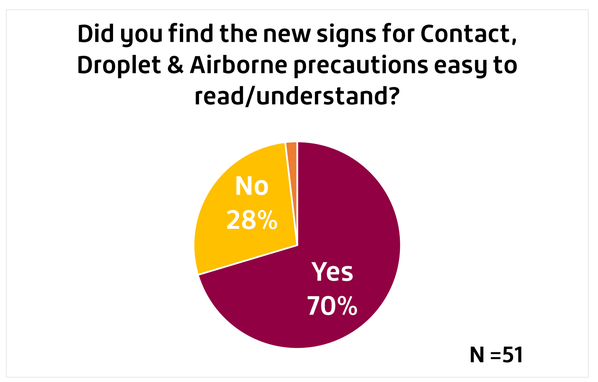


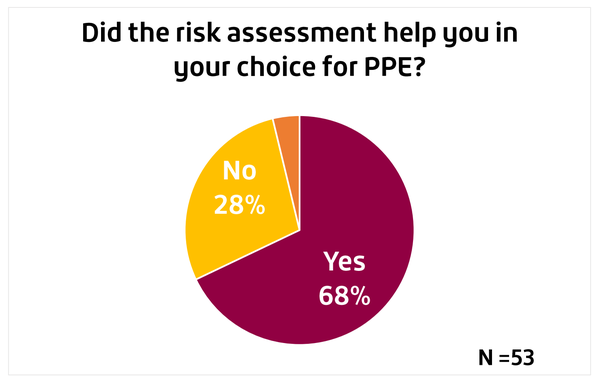


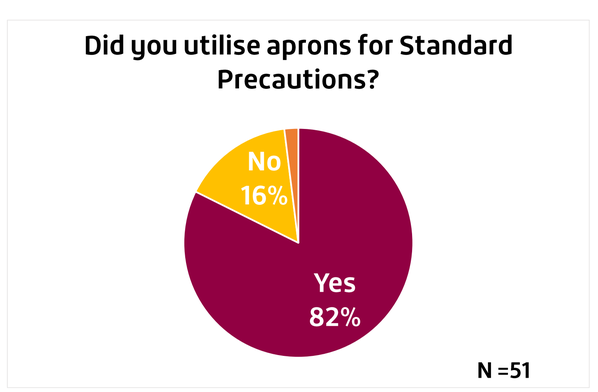
Survey Results

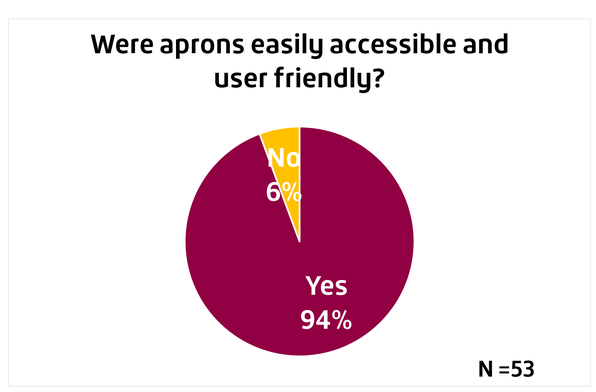
The online survey was conducted 6 weeks following the implementation of this intervention. The survey was undertaken by 53 staff based on the ward with a professional breakdown of 42 Nurses, 5 Doctors, 4 Allied Health & 2 Domestic staff. The results of the survey are contained below (Figure 3).

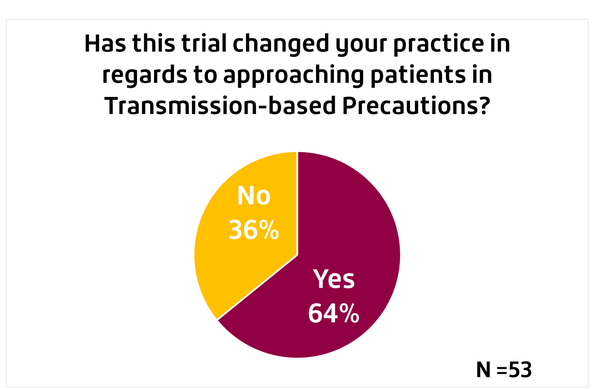
Figure 3 – Survey Results

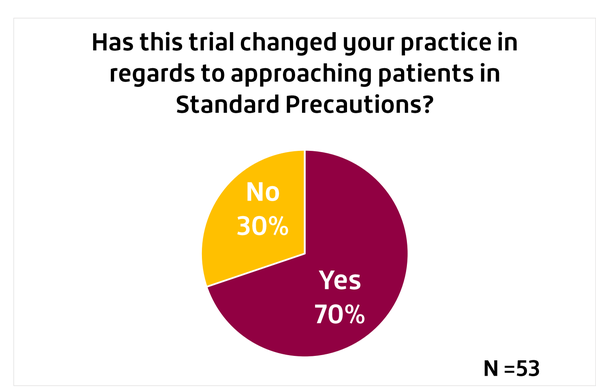












Discussion

The staff survey revealed that the majority found the PPE risk assessment tool helped in their choice of PPE. The new transmission-based precaution signage was easy to read and understand. Also the introduction of aprons was well accepted and were utilized for patients in standard precautions where anecdotally long sleeved gowns, the only option previously, were rarely used. The survey also revealed that the majority of the staff's practice had changed with regards to caring for patients in both standard and transmission-based precautions.

The affirmation by staff for this intervention we would argue was underpinned by the PPE risk assessment tool. This tool shifted the emphasis away from the previous default PPE requirements, solely based on patient precautions. This PPE risk assessment tool now aided PPE selection based on patient care activity, the invasiveness of a procedure and the potential for exposure to body fluid or substance. We believe this provided staff with a much more flexible and dynamic approach to PPE usage.

Using the concepts of choice architecture we were able to carefully and deliberately design tools to focus on ways of positively improving staff behaviour in adhering to standard and transmission-based precautions. Overall, we believe this trial will support a successful roll-out of these new processes and tools across the whole of our Health Service.

Conclusion

Using concepts of choice architecture in developing this intervention with new models of care, risk assessment tools and signage, we believe we have improved staff reported adherence to standard and transmission-based precautions. This improved adherence may subsequently help reduce the risk of infection transmission at our Health Service.

Acknowledgments:

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