Multi Resistant Organism Negative Screening the PAH way

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Background

Multi-resistant organisms (MRO) are bacteria that are resistant to multiple classes of antimicrobial agents. MRO's like Methicillin-Resistant *Staphylococcus aureus* (MRSA), Vancomycin-Resistant *Enterococci* (VRE), Multi resistant *Acinetobacter baumannii* (MRAB), and *Klebsiella pneumoniae* Extended Spectrum β Lactamase-producing (KLEB ESBL) significantly increase the risk of morbidity, mortality and prolonged hospital stay, especially when associated with infection [1,2]. Recommendations to manage the spread of MROs in health care facilities include managing patients under transmission-based precautions [3-6].

With an increasing prevalence of MROs, isolating patients in single rooms under transmission based precautions can be difficult due to bed availability and it also significantly impacts on health care costs [7]. Another negative effect of isolation includes the potential for healthcare workers spending less time with patients managed in isolation as they are less likely to enter patients room unless the need to provide clinical care [7]. Studies suggest patients under contact isolation are more likely to report mental health issues including anxiety and depression due to social isolation and segregation [2,7].

Coordinated strategies implemented within health care facility's (HCFs) can minimise transmission of MRO's, however of equal importance is determining when application of these additional measures are no longer required. Negative screening is one such process and involves the collection of screening swabs over a period to determine if a patient still has carriage of a MRO. To date there are no uniform guidelines available to ensure all MRO patients are negative screened in the same manner [3,4].

With an increasing demand for isolation of MRO patients, the Infection Control team at The Princess Alexandra Hospital (PAH), a large 835 bed tertiary referral hospital based in Metropolitan Brisbane, undertook a variation in practice of local negative screening policy. As a result, a greater cohort of patients were able to be screened negative for MROs.

Method

With no national consensus available for negative screening of MROs, the Infection Control team developed the following guide based on national screening recommendations and longitudinal surveillance epidemiology data from within PAH.

MROs considered eligible for negative screening

- MRSA (any phenotype)
- VRE (VAN-B only)
- MRAB
- *Klebsiella pneumoniae* ESBL producer

Patient eligibility criteria

- At least 12 months elapsed since last positive result
- Admitted in single room, not co-horted with other positive MRO patients.

Electronic data systems including Multiprac®, iEMR®, AUSLAB® and HBCIS® were used to identify patient's eligibility and the generation of pathology orders for negative screening by Infection Control staff.

Clearance criteria

MRSA

- Two consecutive culture negative nose swabs
- One wound swab if any wound present

These specimens were collected by nursing staff only, with the period between two swabs at least 24hrs and up to one month. See Figure 1.

VRE (Van-B), ESBL KLEB and MRAB required

- Two consecutive culture negative stool or rectal swabs
- One wound swab if any wounds present
- One urine specimen

These specimens were collected by nursing staff only, with the period between two swabs at least 24hrs and up to one month apart. See Figure 2.

On successful clearance of MRO, contact precautions were ceased and patient verbally informed of the outcome if still admitted. If patient discharged before results were finalised, a letter was sent to notify of the outcome.

Electronic data systems including iEMR® and HBCIS® Infection Control alerts were updated to reflect the patient's negative status and that the need for additional transmission based precautions was ceased. For example: Screened negative for MRSA on dd/mm/yyyy.

Negative Screening for MRSA

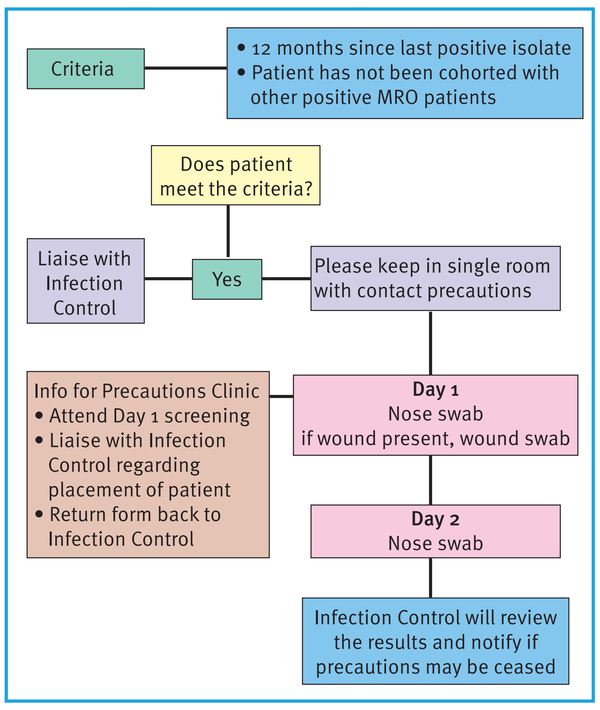

Figure 1

Negative Screening for VRE VAN B, KLEB ESBL, MRAB

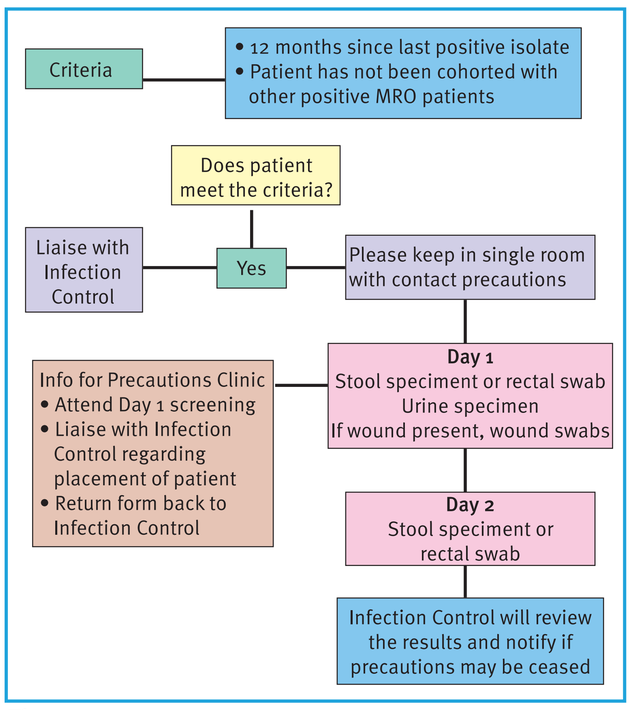

Figure 2

Result

From Jan 2016 to May 2018 (28months), 1221 patients were identified eligible to be negative screened on admission. 773 (63%) patients successfully completed the negative screening process and deemed no longer a MRO carrier, thus no longer requiring contact precautions. However, 448 (37%) patients were unable to be cleared. Those patients being unsuccessful for clearance, 122 (10%) patients yielded a positive result on screening, 66 patients were co-horted with positive MRO patients after start of negative screening process, thus deeming them ineligible for screening. For the remaining 260 (21%) patients, swabs were either not collected or not collected according to PAH policy refer Figure 3.

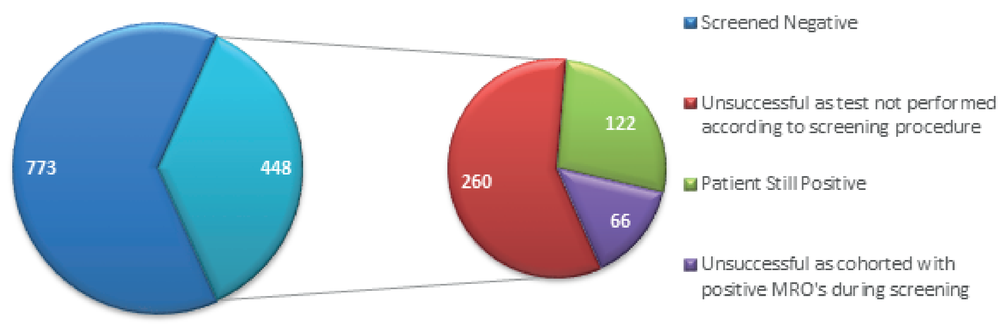

Figure 3 : Screening Data Jan 2016 – May 2018

Conclusion

The revision of the screening policy enabled 773 patients to be screened negative, thus no longer requiring isolation or contact precautions. The literature supports removal of transmission based precautions as it reduces healthcare costs and improves patient outcomes, general health and wellbeing. The main cause of unsuccessful clearance of MRO was identified as swabs not attended by direct care staff. Patients remaining colonised with MROs was the second highest factor for being unable to clear MRO status.

As there are no evidence based guidelines supporting the most reliable method for negative screening of different MROs, our procedure for negative screening of MROs was practical within our facility. Further efficiencies may be gained with increased communication and strategies to enhance screening attendance by direct care staff. Further efficiencies could also be gained by more research within this field.

Acknowledgement: Infection Control team Princess Alexandra Hospital

References

1. Queensland Health (2017). Management of multi-resistant organisms guideline. Retrieved from https://www.health.qld.gov.au/__data/assets/pdf_file/0026/444626/multi-resistant-organisms.pdf
2. Sohn, K., Peck, K., Joo, E., Ha, Y., Kang, C., & Chung, D. et al. (2018). Duration of colonization and risk factors for prolonged carriage of vancomycin-resistant enterococci after discharge from the hospital. Retrieved from http://dx.doi.org/10.1016/j.ijid.2012.09.019
3. Ghosh, A., Jiao, L., Al-Mutawa, F., O'Neill, C., & Mertz, D. (2018). Value of an active surveillance policy to document clearance of methicillin-resistant Staphylococcus aureus and vancomycin-resistant enterococci amongst inpatients with prolonged admissions. Retrieved from http://dx.doi.org/10.1016/j.jhin.2014.09.011
4. Lee, X., Pettitt, A., & Dancer, S. (2018). Quantifying the relative effect of environmental contamination on surgical ward MRSA incidence: An exploratory analysis. *Infection, Disease & Health*, 23(3), 127-136. doi: 10.1016/j.idh.2018.02.005
5. NHMRC (2010) Australian Guidelines for the Prevention and Control of Infection in Healthcare. Commonwealth of Australia.
6. Siegel, J., Rhinehart, E., Jackson, M., & Chiarello, L. (2007). Management of multidrug-resistant organisms in health care settings, 2006. *American Journal of Infection Control*, 35(10), S165-S193. doi: 10.1016/j.ajic.2007.10.006
7. Werner, C., Zimmerman, P., & Elder, E. (2018). Hospital based clearance of patients with skin and soft tissue methicillin resistant Staphylococcus aureus (MRSA): A systematic review of the literature. Retrieved from http://dx.doi.org/10.1016/j.idh.2016.07.001

Poster produced by Patient Safety & Quality Unit, Princess Alexandra Hospital, 2018