

RESPONDING TO AN OUTBREAK OF METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) IN SPECIAL CARE NURSERY, HOSPITAL MELAKA

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01. Introduction

Hospital Melaka is a 1140 bedded state and referral hospital with 62 bedded SCN. The Special Care Nursery (SCN) in Hospital Melaka has 5 open cubicles with around 10 cots in each cubicle and 5 isolation rooms with a single cot. The allocation of infants per nurse ranges from one cubicle to another, depending on the level of care. The NICU is situated within the SCN, separated from the open cubicles by a corridor. Being the only SCN in the state, it accepts both infants born within the hospital as well from other centers and caters to a variety of complicated cases. The SCN historically has a very low incidence of MRSA with the occasional case every few months.

02. Outbreak identification

An outbreak was declared when four (4) neonates in the SCN were diagnosed with MRSA over 4 weeks. An Outbreak Management Team (OMT) consisting of infection control unit, infectious disease physician, microbiologist and paediatric team was immediately convened.

03. Outbreak Investigation

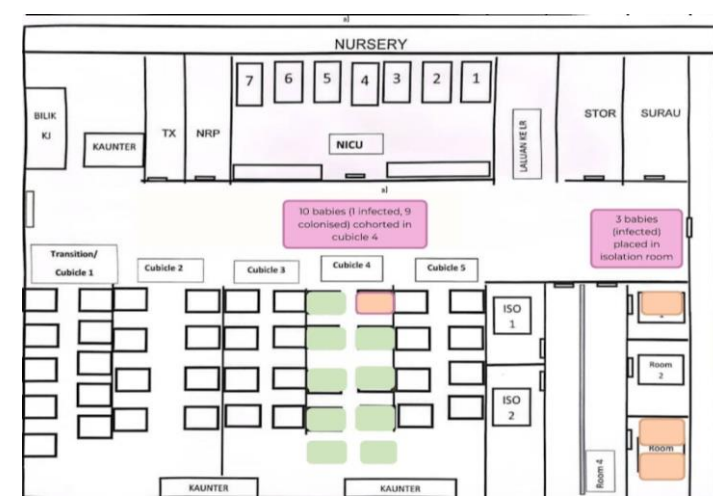
1. Root cause analysis (RCA): of 2 severe wrist abscess cases identified issues related to venipuncture and branula insertion as contributing factors.
2. Evaluation of the IPC practice: non-adherence to infection prevention & control (IPC) practices, poor hand hygiene (HH) compliance at 71%, and inadequate environmental & equipment cleaning
3. Active surveillance: Screening on the mothers of 4 index cases, 62 infants & 45 staff; with positive samples sent for DNA fingerprinting.



04. Control measures

Enhanced IPC measures

- Reinforcing standard & contact precautions, cohorting patient & staff, decolonisation regimen on affected patients, revising existing procedures (eg: top and tail), weekly audits.



Enhanced environmental cleaning

- Developing equipment cleaning protocol with details on the high touch areas with pictorial guide (eg: for ultrasound machine), in-depth environmental cleaning of the ward.



Enhanced surveillance

- Active surveillance: 62 infants (9 positive), 45 staff (1 positive) and 9 mothers (none positive) were screened.
- DNA fingerprinting of the positive cases.

Education and Communication

- Daily safety briefing, weekly CME/CNE, bedside teachings, revision of the orientation checklist, re-training (hands on & videos) for phlebotomy procedures, health education for visiting caregivers.



05. Results

13 patients were affected; with 4 clinical infections and 9 colonisers. 15.4% of the cases were bacteremia. DNA fingerprinting from the active surveillance of positive cases and staff showed **three distinct MRSA clusters** identified from **different** cubicles, suggesting cross transmission. No mothers of the MRSA positive babies had positive nasal swab screening.

Table 1. Descriptive Analysis of the affected patients in MRSA Outbreak, SCN Hospital Melaka

DESCRIPTIVE ANALYSIS					
	Median	Range	Cubicle	No.	Percentage
Age (weeks)	4 weeks	0 - 21 weeks	Cubicle 2	2	23.10%
Birth weight	1.93 kg	0.62 kg - 3.86 kg	Cubicle 3	4	30.70%
Duration of admission at MRSA diagnosis	33.5 days	2 - 149 days.	Cubicle 4	5	23.10%
			Cubicle 5	2	23.10%
Gender	No.	Percentage	Device		
Male	7	53.80%	UAC/UVC	5	38.50%
Female	6	46.20%	Peripheral line	6	46.30%
Term/Preterm			PICC	6	46.30%
Term	5	38.5%	Ventilator	8	61.50%
Preterm	8	61.5%	CBD	2	15.40%
Specimen			Procedure		
Pus	2	15.40%	Venipuncture	13	100.00%
Blood	2	15.40%	ECHO (bedside)	8	61.50%
Nasal	9	69.20%	X-ray	7	53.80%
Status			Ultrasound	7	53.80%
Infection	4	30.80%	Outcome		
Colonization	9	69.20%	Alive	11	84.60%
			Dead	2	15.4%

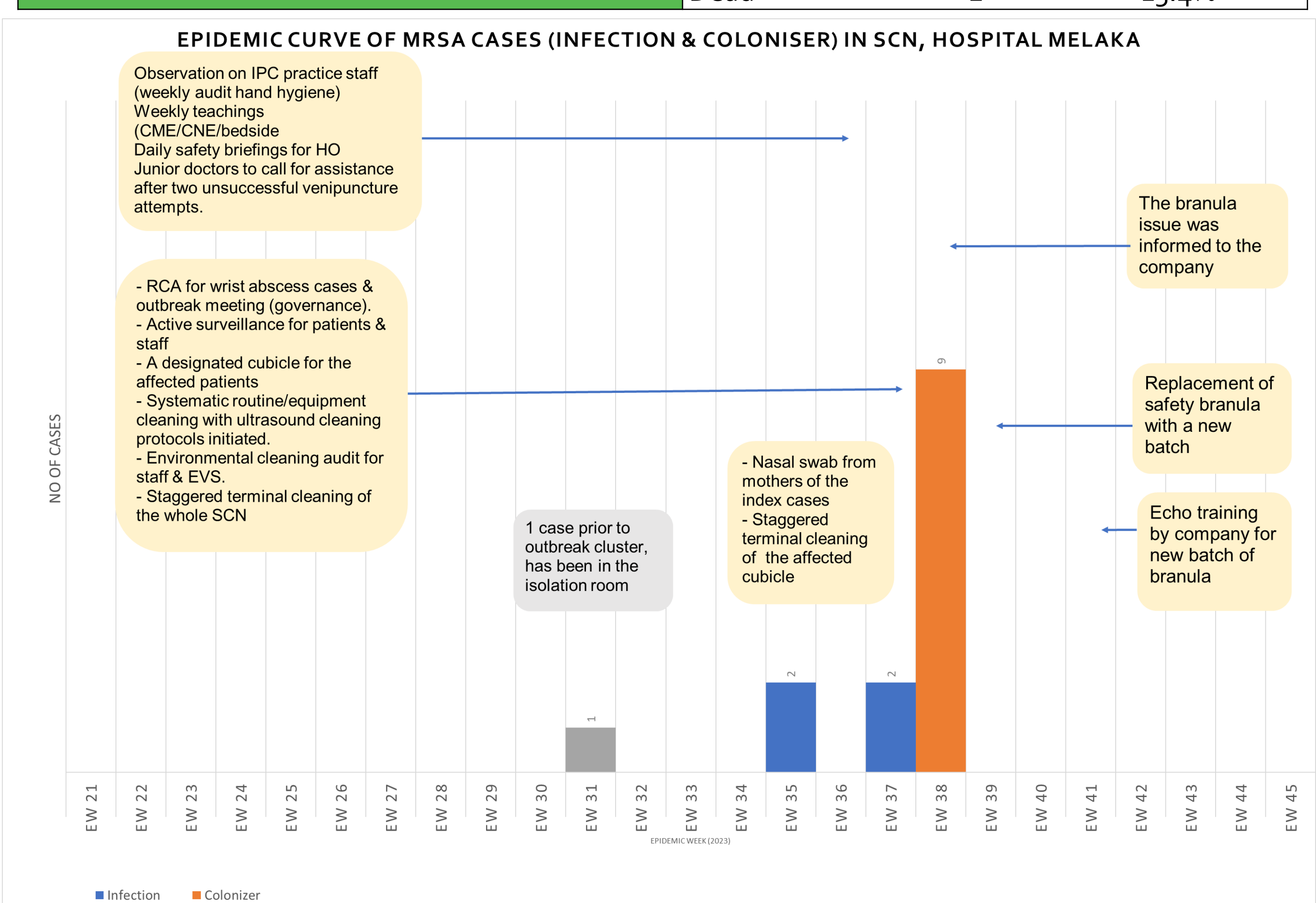


Figure 1. Epidemic curve of MRSA cases (infection and coloniser) during the outbreak in Special Care Nursery, Hospital Melaka *This epidemic curve is based on the date of the sample taken

06. Conclusion

We illustrate how lapses in IPC practice and environmental cleaning to an MRSA outbreak. Ensuring compliance to HH & environmental hygiene is important to prevent transmission. Rapid response by doing active surveillance, combined with other control measures have successfully contained the outbreak. The MRSA incidence rate in SCN is back to baseline, proving the control measures' effectiveness.

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