

Strategies for Preventing Healthcare-Associated MDRO infections in Hong Kong

PTY Ching

WHO CC

Hong Kong



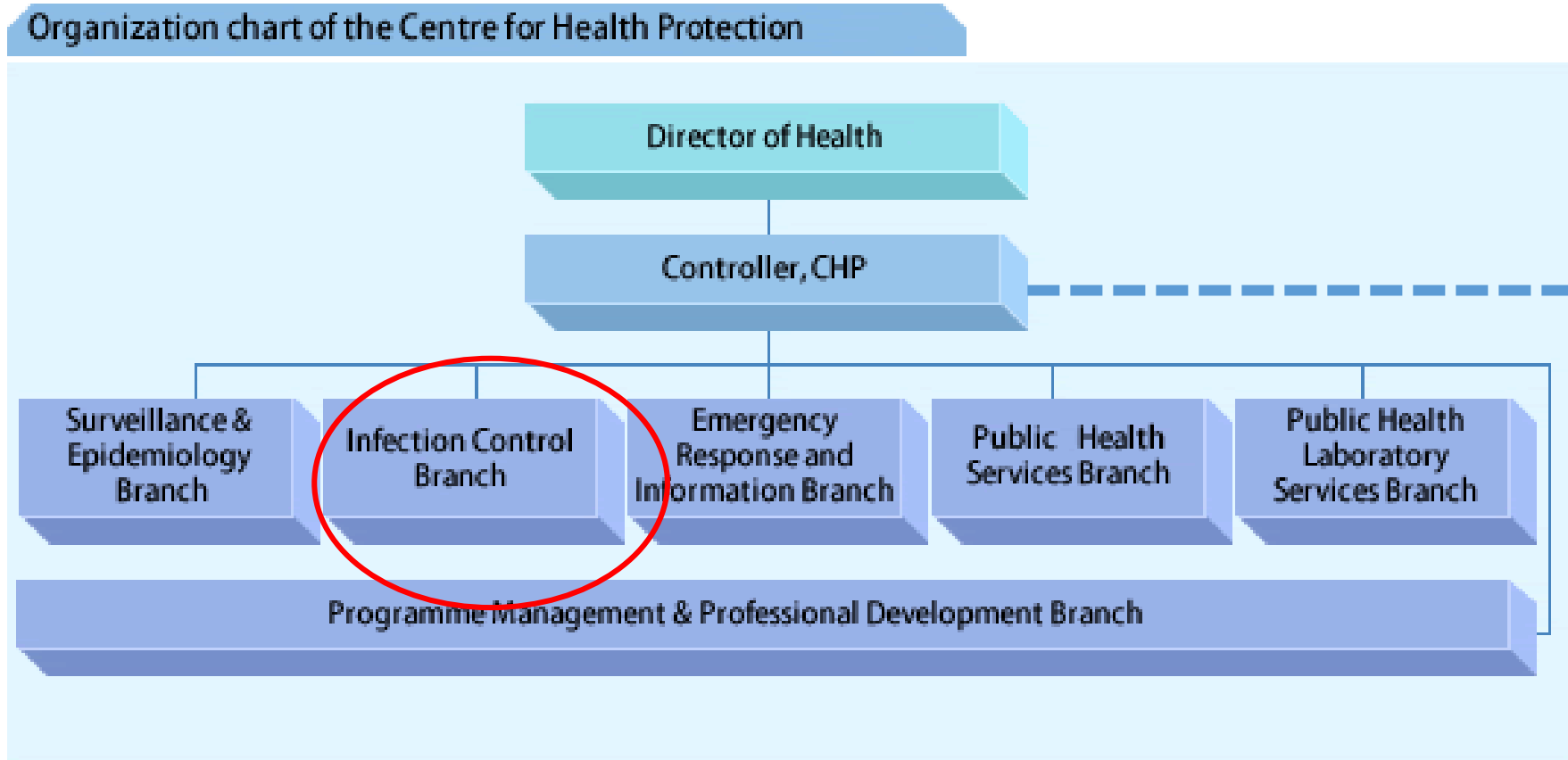
Health Facts of Hong Kong

2017 Edition

Health Facilities (End 2016)

Number of Public Hospitals and Institutions under Hospital Authority	42
Number of Private Hospitals	11
Number of Nursing Homes	63
Number of Hospitals under Correctional Institutions	21
Number of Hospital Beds in Hospitals in Hospital Authority	28 126
Number of Hospital Beds in Private Hospitals	4 226
Number of Hospital Beds in Nursing Homes	5 858
Number of Hospital Beds in Correctional Institutions	880

Organization chart of the Centre for Health Protection



Hospital Authority



保障市民健康
Protecting Hong Kong's health



Department of Health
Hong Kong SAR

Feature:

Prevalence survey of infections in public hospitals 2010

Local situation of adenovirus activity



LENS ON CHP

Prevalence survey of infections in public hospitals 2010

Table 1 - Prevalence of infections.

Prevalence	Overall Infection % (95% C.I.)	CAI % (95% C.I.)	HAI % (95% C.I.)	OHA1 % (95% C.I.)
2010	15.0 (14.5-15.5)	11.9 (11.5-12.4)	2.7 (2.5-2.9)	0.5 (0.4-0.6)
2007	15.2 (14.7-15.7)	11.4 (11.0-11.8)	3.2 (2.9-3.4)	0.8 (0.7-0.9)

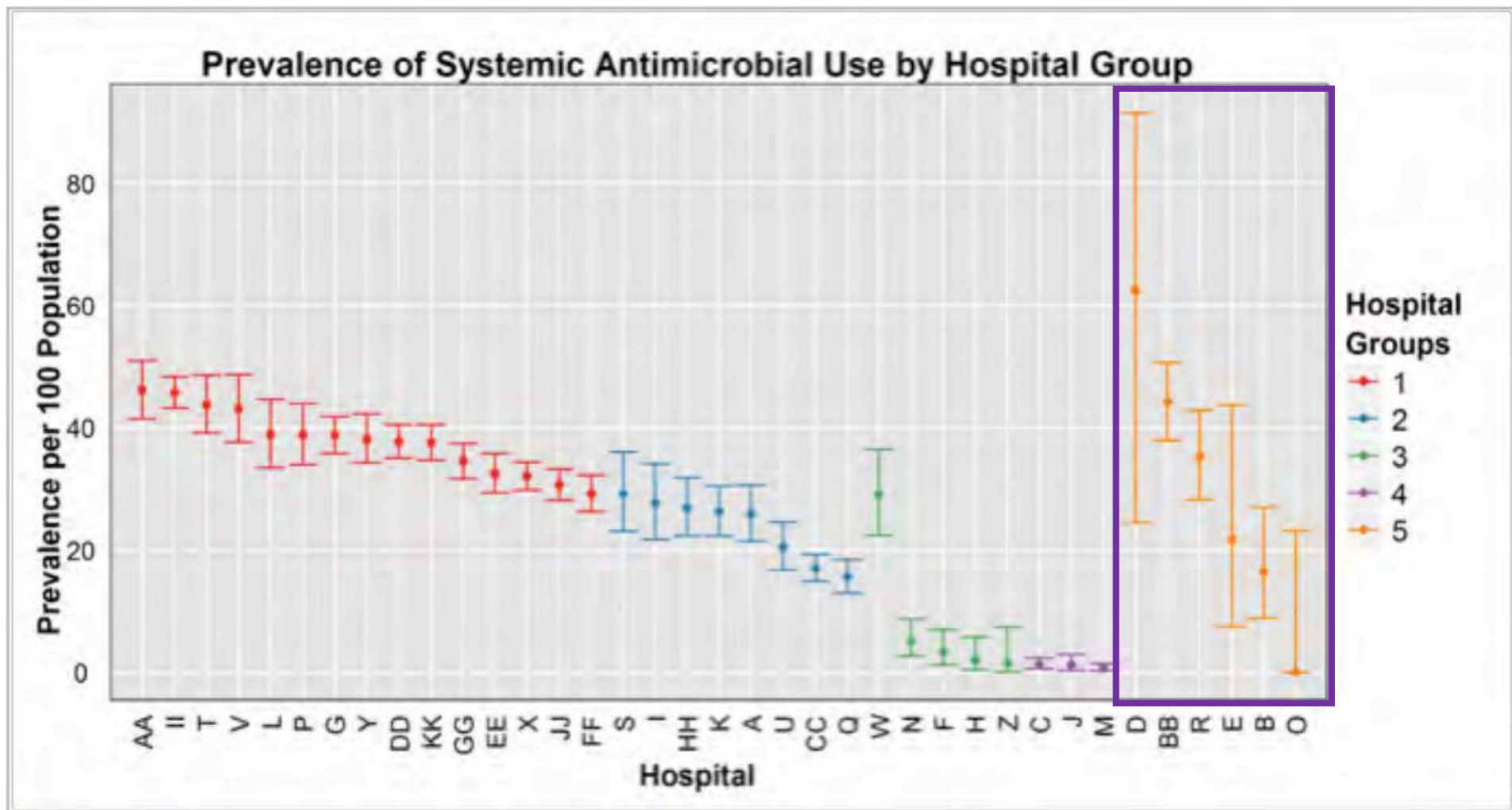


Figure 3 - Prevalence of systemic antimicrobial use by hospital group.

The most common systemic antimicrobials used were **augmentin (11.8%)**, followed by **cefuroxime (2.7%)** and **levofloxacin (2.4%)**. The pattern was similar to 2007. The overall prevalence of systemic antimicrobial use was **higher in 2010** compared to 2007 (26.6%; 95% C.I.: 26.0%-27.2%)

- Group 1** – general acute hospitals
- Group 2** – hospitals with mixture of acute/ non-acute beds;
- Group 3** – hospitals with non-acute/infirmarary beds
- Group 4** – psychiatric hospitals
- Group 5** – acute hospitals of special nature.

Infection Control Challenges and Opportunities

IN

CONTROLLING OF MDRO

Challenges and Opportunities

- Prioritize MDRO
- Modify Isolation Facilities
- Improve Environmental Cleaning



Health Topics




[Home](#) > [Health Topics](#) > [Control of Multi-Drug Resistant Organisms \(MDROs\)](#)

- Communicable Diseases
- Non-Communicable Diseases and Healthy Living
- Healthy Life Course
- Organ Donation
- Travel Health
- Health and Hygiene
- Control of Multi-Drug Resistant Organisms (MDROs)**
- Poisoning

Control of Multi-Drug Resistant Organisms (MDROs)



Information on MDROs

1. Health Education Pamphlet: Multi-Drug Resistant Organisms (MDROs) 
2. e-Resources - Community-associated Methicillin-resistant Staphylococcus Aureus (CA-MRSA) Infection

Safe Use of Antibiotics

1. Proper use of antibiotics 
2. Safe Use of Antibiotics
3. Health Education Pamphlet: Prevent Antimicrobial Resistance 

Hand Hygiene

1. Proper hand hygiene

	General Public
	Health Professionals
	Institutions & Schools
	Business & Workplace

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MDRO in HA hospitals Hong Kong

		2012	2013	2014	2015	Change
MRSA / all <i>S. aureus</i>		43.6%	46.3%	45.7%	46.1%	→
MRSA BSI <i>per 1,000 acute bed days</i>	Overall	0.138	0.146	0.143	0.146	→
	≥ 2 days of admission	0.059	0.062	0.059	0.057	→
VRSA		0%	0%	0%	0%	→
VRE		0.34%	1.26%	0.74%	0.25%	↓
ESBL producing Enterobacteriaceae (<i>E.coli</i> and <i>Klebsiella</i> spp. only)		24.3%	23.9%	23.3%	23.2%	→
CRE/CPE Carbapenemase producing Enterobacteriaceae (<i>E.coli</i> & <i>Klebs</i> total isolates)		36	33	108 (105,993)	132 (110,858)	↑
MDRA		10.4%	18.6%	24.9%	15.9%	↓
MRPA		0.07%	0.09%	0.06%	0.02%	↓

MRPA=concomitant R to Imipenem, Ceftazidime. Amikacin and Ciprofloxacin

MDRA= concomitant R to Fluoroquinolones, Aminoglycosides, Cephalosporins and BL/BLase inhibitor combinations

MDRO in HA hospitals

	2014	2015	2016	2017	Change
MRSA / all S. aureus	45.7%	46.1%	43.5%	43.1%	↓
MRSA BSI <i>per 1,000 acute bed days</i>	0.143	0.146	0.158	0.144	→
VRSA	0%	0%	0%	0%	none
VRE	0.74%	0.25%	0.18%	0.15%	↓
ESBL producing Enterobacteriaceae (<i>E.coli</i> and <i>Klebsiella</i> spp. only)	23.3%	23.2%	22.4%	22.0%	↓
CPE Carbapenemase producing Enterobacteriaceae (E.coli & Klebs total isolates)	0.10%	0.12%	0.30%	0.40%	↑
MDRA	24.9%	15.9%	11.7%	8.6%	↓
MRPA	0.06%	0.02%	0.02%	0.06%	→

MRPA=concomitant R to Imipenem, Ceftazidime. Amikacin and Ciprofloxacin

MDRA= concomitant R to Fluoroquinolones, Aminoglycosides, Cephalosporins and BL/BLase inhibitor combinations

Year		2011	2012	2013	2014	2015	2016	2017						
No of new cases		19	36	33	108	134	340	473						
Imported case		10 (53%)	27 (75%)	26 (79%)	48 (44%)	41 (31%)	79 (23%)	127 (27%)						
Imported from: Hospitalization history outside HK (Since 1 October 2016, the criteria has been extended from 6 months to 12 months)	China	9	China	23	China	16	China	42	China	31	China	63	China	101
	USA	1	Thailand	2	India	4	India	4	India	6	India	7	India	8
			Taiwan	1	Pakistan	2	Vietnam	1	Nepal	3	Nepal	2	Thailand	5
			Burma	1	Indonesia	1	Germany	1	Thailand	1	Vietnam	2	Vietnam	3
					Cambodia	1					Pakistan	2	America	1
					Korea	1					Indonesia	1	Bangladesh	1
					Thailand	1					Bail	1	Cambodia	1
											Cambodia	1	Nepal	1
													Pakistan	1
													Singapore/Kuala Lumpur	1
												Spain	1	
												Taiwan	1	
												UK/India	1	
												Ukraine	1	
Type of specimen	Clinical specimen	9 (47%)	13 (36%)	3 (9%)	11 (11%)	21* (15%)	45 (13%)	46 (10%)						
	Screening	10 (53%)	23 (64%)	30 (91%)	97 (89%)	114* (85%)	295 (87%)	427 (90%)						

CPE Statistic

Year		2011	2012	2013	2014	2015	2016	2017 (1Q)	2017 (2Q)	
No of new cases		19	36	33	108	134	340	96	85	
Imported case		10 (52.6%)	27 (75%)	26 (78.79%)	48 (44%)	41 (30.6%)	79 (58.6%)	15 (15.8%)	31 (36.4%)	
Imported from:		China 9	China 23	China 16	China 42	China 31	China 63	China 11	China 24	
Hospitalization history outside HK (Since 1 October 2016, the criteria has been extended from 6 months to 12 months)		USA 1	Thailand 2	India 4	India 4	India 6	India 7	Thailand 2	Thailand 2	
			Taiwan 1	Pakistan 2	Vietnam 1	Nepal 3	Nepal 2	India 1	India 2	
			Burma 1	Indonesia 1	Germany 1	Thailand 1	Vietnam 2	Bangladesh 1	UK & India 1	
				Cambodia 1			Pakistan 2		Spain 1	
				Korea 1			Indonesia 1		Ukraine 1	
				Thailand 1			Bail 1			
							Cambodia 1			
Type of specimen	Clinical specimen	Sterile	1 bile	0	0	2 (1 blood, 1 bile)	1 (peritoneal swab)	6 (3 blood, 2 bile, 1 hydrosalpinx asp.)	0	1 blood
		Non sterile	8 (3 urine, 4 sputum, 1 pus swab)	13 (8 urine, 3 sputum, 2 wound)	3 (MSU, CSU, hand abscess wall tissue)	9 (5 CSU, 2 sputum/ETA, 1 thigh tissue, 1 knee wound)	20* (10 urine, 2 sputum, 5 wound, 1 tissue, 1 peritoneal dialysis fluid, 1 pus swab)	39 (26 urine, 8 TA/ETA/Sputum, 1 tubal drain fluid, 4 wound)	8 (4 urine, 1 sputum, 1 stool, 1 peritoneal dialysis fluid, 1 IV Catheter)	9 (7 urine, 2 ETA/Sputum)
	Screening	10 (52.6%)	23 (63.9%)	30 (90.9%)	97 (89%)	114* (85.07%)	295# (86.8%)	88 (91.7%)	75 (88.2%)	
PCR result	NDM	2	10	18	48	101	190	47	60	
	KPC	4	7	7	36	19	52	34	9	
	IMI	1	1	1	1	0	5	1	2	
	IMP	10	14	4	11	9	67	8	7	
	VIM	1	1	0	0	1	0	0	0	
	OXA	0	1	0	3	1	21	6	5	
	NDM+IMP	1	0	1	1	0	0	0	0	
	NDM+OXA	0	2	0	5	1	3	0	2	
	KPC+IMP	0	0	2	3	2	0	0	0	
	NDM + IMI	0	0	0	0	0	1	0	0	
OXA + IMP	0	0	0	0	0	1	0	0		
Age	0	2	3	1	1	0	8	2	2	
	1-4	1	2	2	0	1	4	2	3	
	5-14	0	0	2	1	2	2	0	1	
	15-24	0	0	0	3	4	4	3	4	
	25-34	1	1	3	3	7	11	6	7	
	35-44	0	2	1	9	12	26	8	8	
	45-54	1	3	4	11	18	32	4	8	
	55-64	3	8	4	23	24	53	10	7	
	65-80	7	9	8	40	34	106	26	24	
>=81	4	8	8	17	32	94	35	21		

Data Source: Hospitals reported to CICO office *1 patient had positive results in both clinical and screening specimens

To show the PCR typing

1. NDM
2. KPC
3. IMI

“Usually accepted that eradication would be unlikely in the highly endemic setting”

< 20 cases	100% elimination
20-39 cases	79% elimination
>39 cases	10% elimination

Marshall et al, JHI 2004:56:253

Boyce JM: ICHE 1991:12:36

Still we should try to lower the incidence...

Overcrowding in Hong Kong Public Hospital

Influenza Winter Peak 2018
occupancy of 120-150% - camp beds



Search and Destroy for Low prevalent MDRO

VRE

CRE/CPE screening – all patients stayed in overseas hospitals in past 12 months

VRSA

Screen, Screen, Screen,

CRE

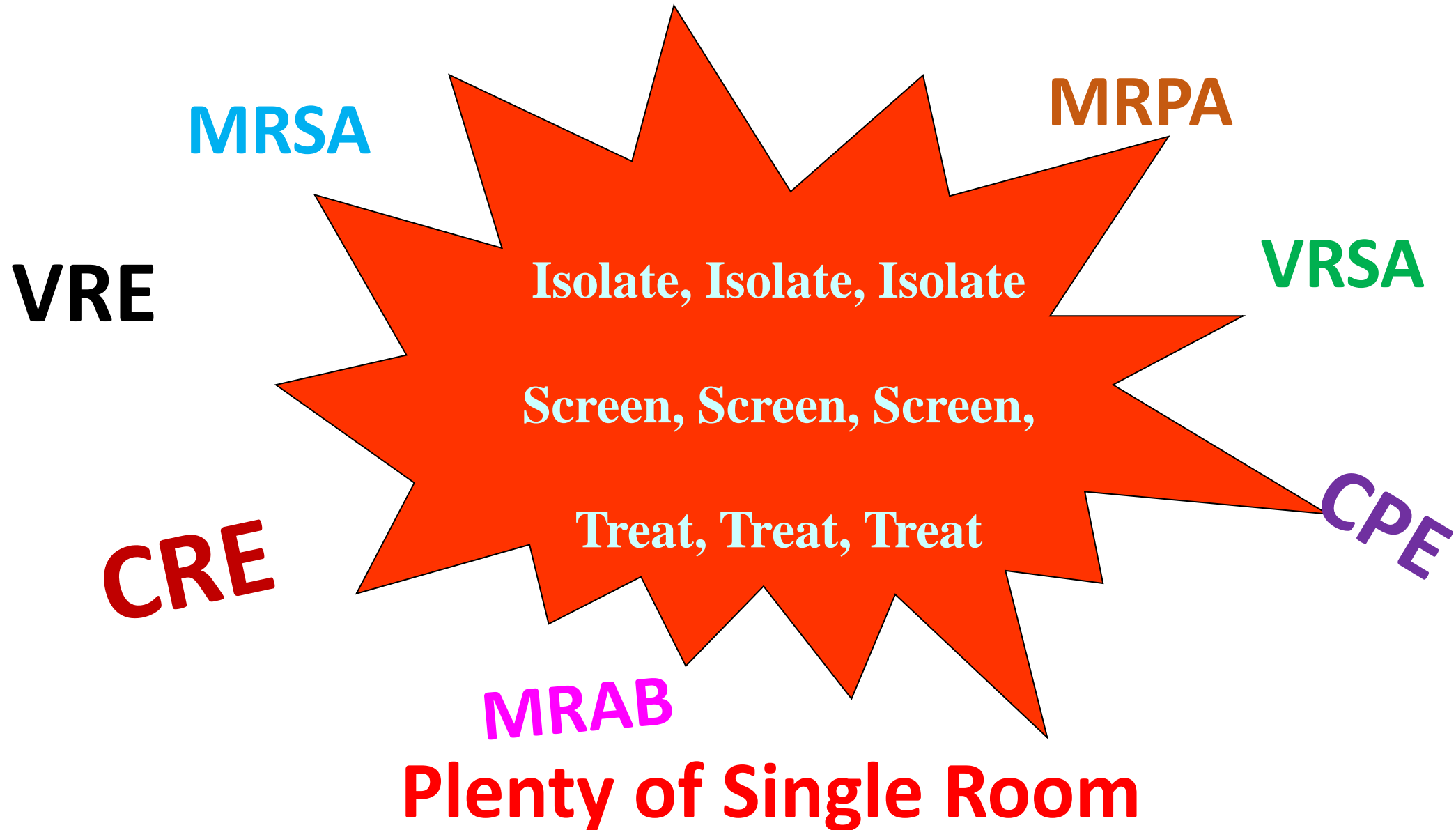
Treat, Treat, Treat

CPE

Isolation Policies in Hospital Authority – Hong Kong

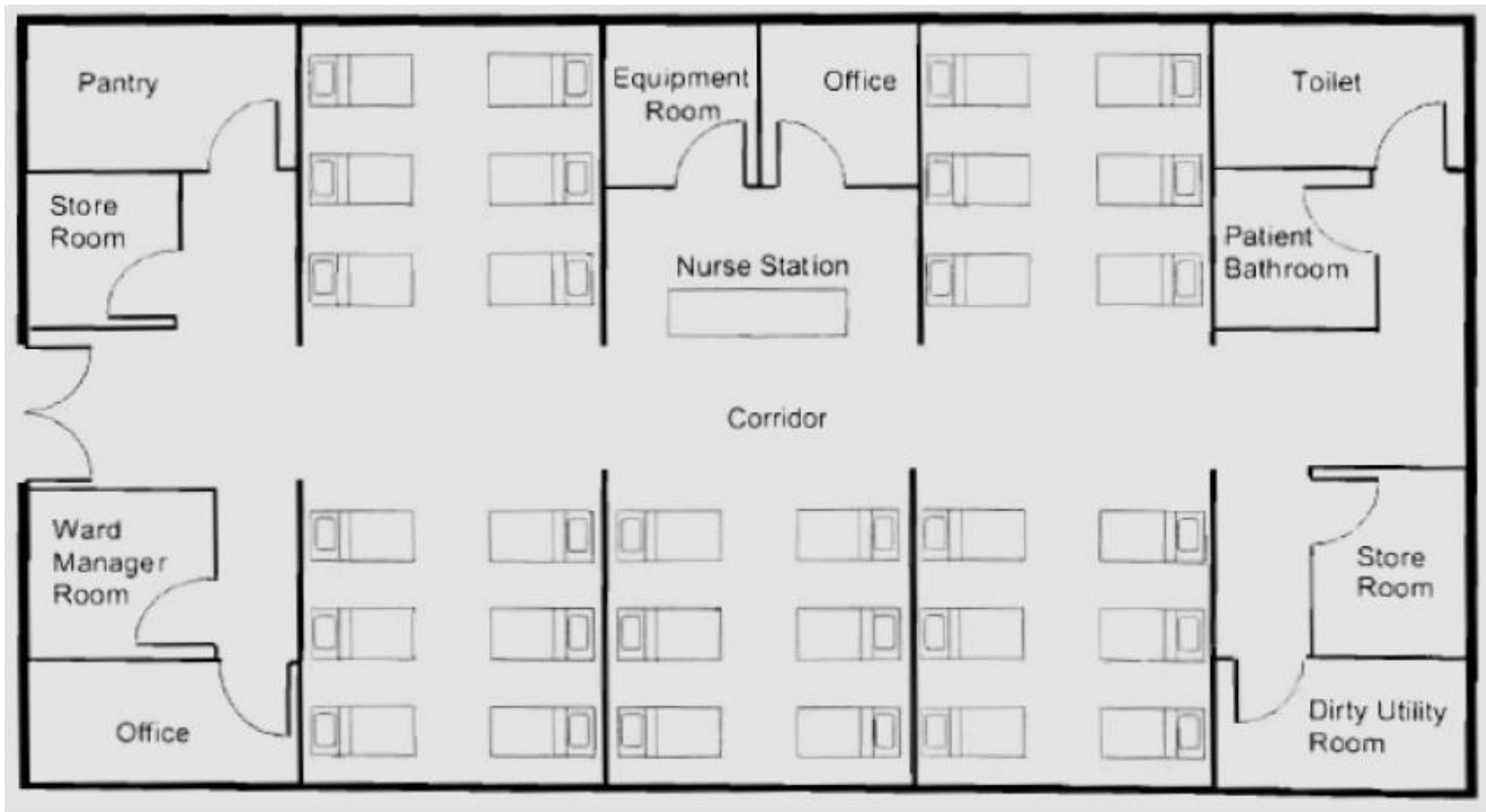
IC tactics	MRSA	VISA/ VRSA	VRE	ESBL	CRE	CRAB/ MDRA	CRPA/ MRPA
Single room	No	Yes	Yes	No	Yes	If available (MDRA)	Yes (MRPA-XDR)
PPE, HH, EnH, Deq	HH	Yes	Yes	HH	Yes	Yes	Yes
CMS alert	No	Yes	Yes	No	Yes	MDRA	Yes
Discharge to RCHE	Allowed	2 –ve culture	2 –ve culture	Allowed	2 –ve culture	Allowed	MRPA: 2 –ve culture
Send isolate to reference lab	No	Yes	Yes	No	Yes	No	No
Notify Dept Health	No	Yes	Yes	No	No	No	MRPA: Yes

Isolation for ALL MDRO in Private Hospitals



Challenges in isolation facilities

- Not enough single room isolation
- Increase manpower when patients are nursed in single room



Layout of general patient ward



Resolution: Single cohort (Specific MDRO patients)
Group cohort (patient with same diagnosis)

- Single cohort ante room - Existing site constraint issue



Resolution: Shared ante room with interlocking doors

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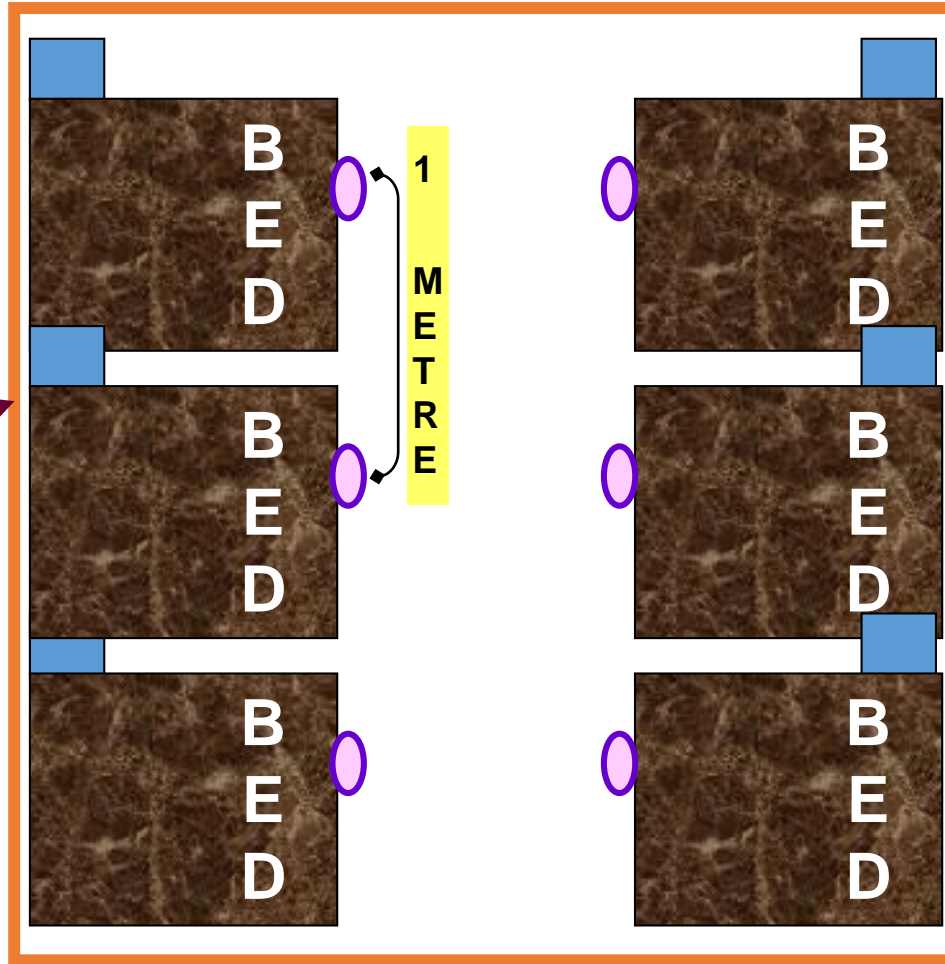
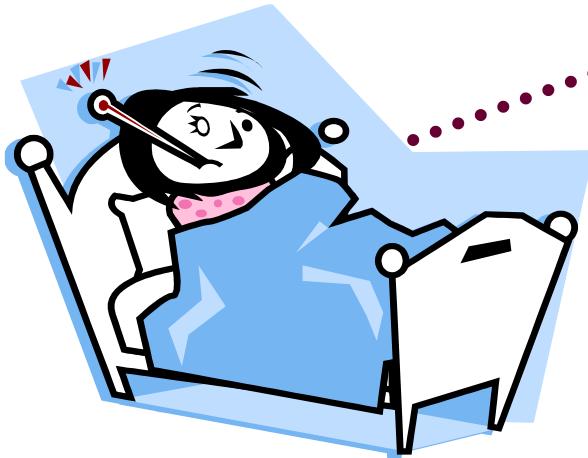
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PPE, HH, EnH, Deq	HH	Yes	Yes	HH	Yes	Yes	Yes
CMS alert	No	Yes	Yes	No	Yes	MDRA	Yes
Discharge to RCHE	Allowed	2 –ve culture	2 –ve culture	Allowed	2 –ve culture	Allowed	MRPA: 2 –ve culture
Send isolate to reference lab	No	Yes	Yes	No	Yes	No	No
Notify Dept Health	No	Yes	Yes	No	No	No	MRPA: Yes

MDRO Cubicle



1. Beds separated by 1 m apart
2. Sufficient supply of PPEs
3. Alcohol hand rub  at each bedside
4. Individual patient care items –BP cuff, stet
5. Cohort same MDRO in one room or cubicle

CORRIDOR
←
TO EXIT



Alcohol hand rub



Nurses station is a clean zone. Medical charts stay here. No gowns or gloves allowed. Mask not really needed if not going in to see patients.

Challenges and Opportunities

Environmental cleaning

Using reusable wash clothes -spreading MDRO and OSH concern

Cleansing of the Environment

HA guideline	Hong Kong	CDC	WHO	AUS	NHS	Canada
when the environment is visibly soiled or contaminated;		✓	✓	✓	✓	✓
General housekeeping surfaces - according to housekeeping cleaning schedule				✓	✓	✓
HTA in General clinical area - cleaned with detergent and water at least once daily		more frequent schedule	✓	✓	✓	✓
HTA in Contact Precautions - cleaned and disinfected at least twice daily.		more frequent schedule	At least daily	(Base on Risk level, e.g. Outbreak)	(Base on Risk level, e.g. ICU, AED)	(Base on Risk level, e.g. VRE, C. diff)

Meeting the challenge of VRE outbreak

Improvement on environmental cleaning

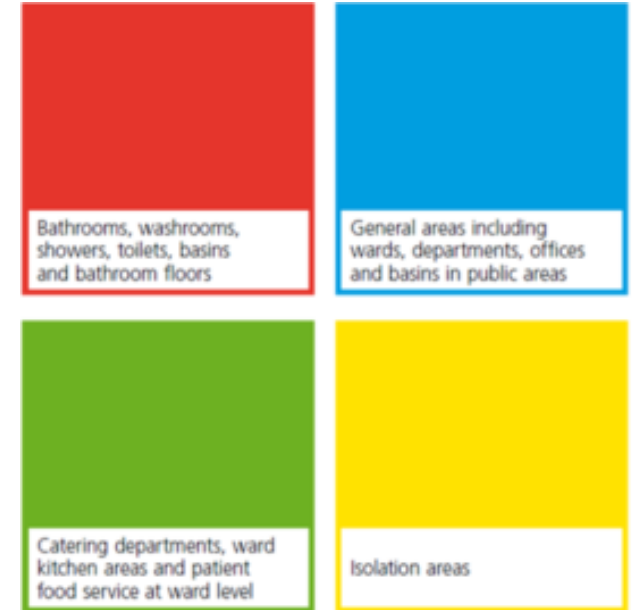
From reusable wash clothes  disposable jay clothes

From disposable jay clothes  single use disinfectant wipes

Plus non-touch environmental disinfection machines

Manual Cleaning :

- Standardize cleaning protocols in clinical areas
- Designated team for EH
- Training
- Onsite coaching and return demonstration
- regular monitoring of cleanliness
- Use of dedicated equipment
- Disposable wipe
- 2:1 disinfectants





Disposable
Wipes

Wipes


Cotton, Disposable, Microfiber, Nonwoven Spunlace

Wipe should have sufficient wetness to achieve the disinfectant contact time. Discontinue use of a disposable wipe if it no longer leaves the surface visibly wet for ≥ 1 min



New technology for the control of MDROs

Kowloon Central Cluster - Queen Elizabeth Hospital		Effective Date	
Document No. : KCC/QE/ICT/ICT/OP/0005		Next Review Date	
Department : Infection Control Team		Version	MAY13
Type of Document: Operating Procedure		Page	1 of 16
Title: Hydrogen Peroxide Vaporization (HPV) Standard Operation Procedure for Advanced Sterilization Products (Glossip™ 400 system)			



Kowloon Central Cluster
Hospital Authority

Queen Elizabeth Hospital

**Hydrogen Peroxide Vaporization (HPV) Standard
Operation Procedure**

Document No.	KCC/QE/ICT/ICT/OP/0005		
Department	Infection Control Team		
Type of document	Operating Procedure	Version	MAY 13
First Issue Date		Document Owner: S Y LEE, SNM(ICT)	
Last Review Date		Signature:	
Effective Date		Approval Officer: DR. NC TSANG, CICO, KCC	
		Signature:	



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Turning Challenges to Opportunities

- Difficulties in controlling MDRO
 - Prioritize MDRO for contact precautions
 - Emerging MDRO implement “search and destroy”
- Coping with insufficient isolation facilities
 - Prioritize emerging MDRO for contact precautions
 - Cohorting SAME mdro with special droplet precautions
- Ineffective environmental cleaning
 - Convert old practice to most up-to-date practices
 - Changed to disposable wipes and non-touch environment disinfection machine



**Thank
You!!!**