101 OF MULTI DRUG RESISTANT ORGANISMS IN PRIVATE HOSPITALS

Dr. Teresa Wang

CASE SHARING

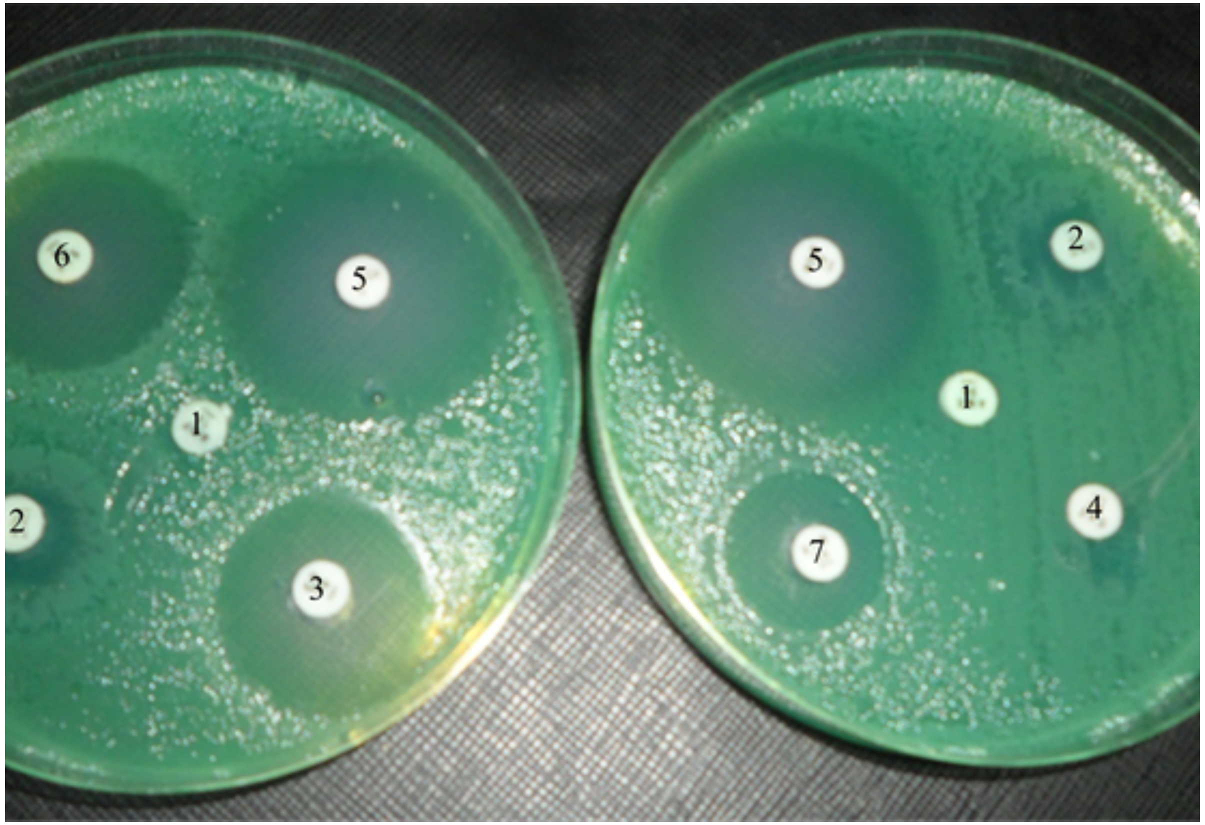
M/84

Carcinoma of L bronchus with L lower lobectomy done at a public hospital in 2021 with good recovery

BPH with history of recurrent UTI, last episode in July 2022

Admitted to public hospital in November 2022 for decreased GC

Imaging showed staghorn stone at R renal calyx with R ureteric stone leading to obstructive uropathy and progressive deterioration in renal function with creatinine up to 600+



PSEUDOMONAS AERUGINOSA

CSU and intra-op urine showed numerous WBC with significant count of *Pseudomonas aeruginosa* cultured

Blood culture grew the same organism with same antibiogram

No improvement of RFT after insertion of double-J stent to R ureter, not for RRT at public hospital

DAMA to private hospital in December 2022

IN THE PRIVATE HOSPITAL…

Started haemodialysis (HD)

Clearance of bacteraemia

Treated as out-patient with post-HD dose of meropenem for 2 weeks

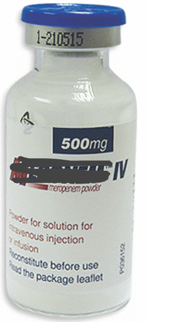
TWO WEEKS AFTER STOPPING MEROPENEM…

Fever again

Blood culture repeatedly grew *P. aeruginosa* resistant to meropenem

- Piperacillin-tazobactam
- Ceftazidime
- Levofloxacin

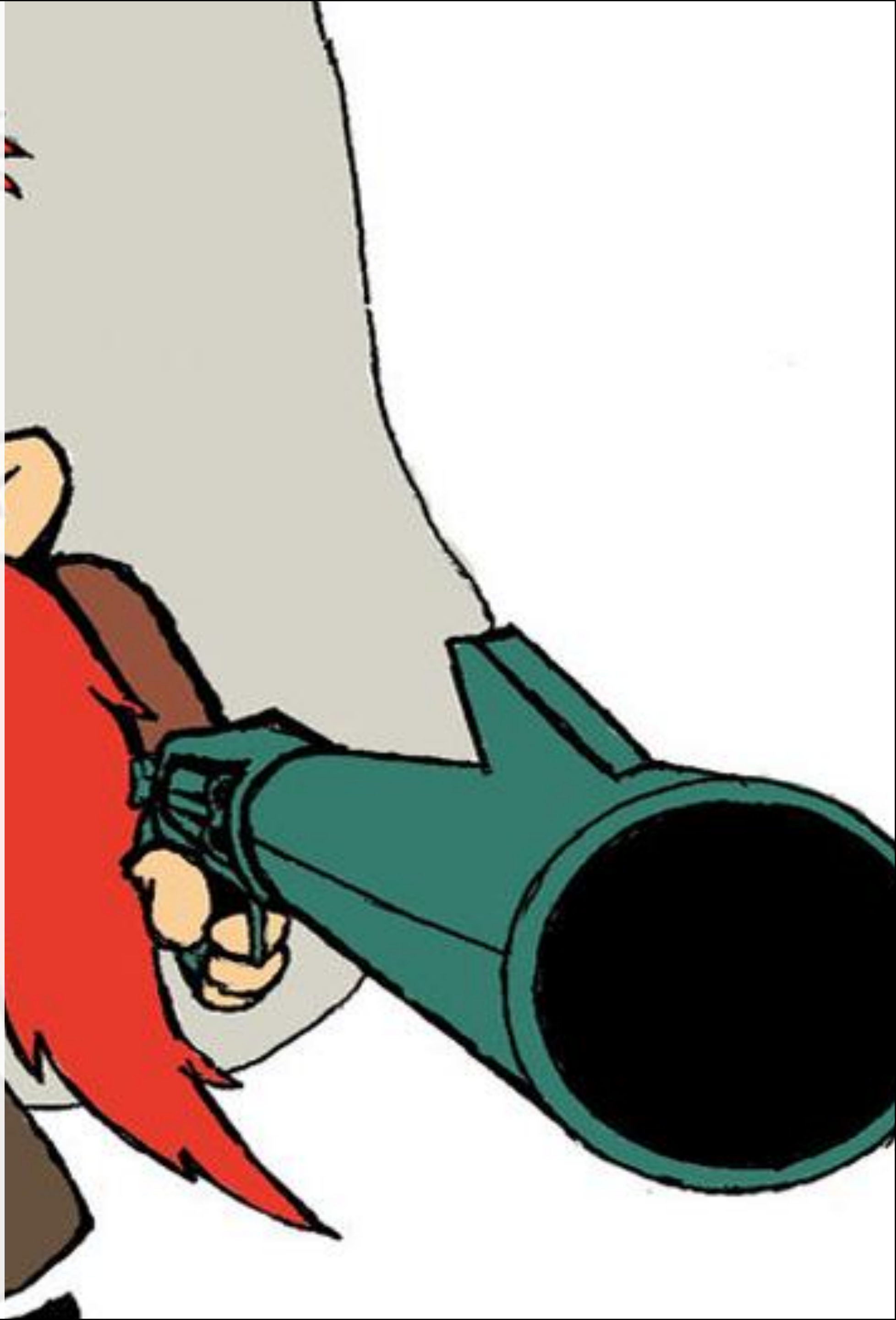
- Only sensitive to aminoglycosides



TESTED SOME NEW BIG GUNS

Ceftazidime-avibactam

Ceftolozane-tazobactam



EMERGING RESISTANCE

Started ceftolozane-tazobactam (C/Z)

Persistent fever with cloudy urine

Blood culture grew *P. aeruginosa* susceptibility to C/Z

Urine culture grew *P. aeruginosa* resistant to C/Z

Switched to ceftazidime-avibactam

WHY IS IT SO DIFFICULT?

1. Niche for bacteria forming biofilm
2. Haemodialysis unpredictable drug level
3. Old age
4. Multiple underlying diseases

Antibiogram data from private hospitals in Hong Kong: 6-year retrospective study

Leo Lui *, LC Wong, H Chen, Raymond WH Yung; for The Working Group of Collaboration between CHP and Private Hospitals on Safe Use of Antibiotics and Infection Control

ABSTRACT

Introduction: The surveillance of antibiotic resistance is critical for the establishment of effective control strategies. The antibiotic resistance situations in private hospitals in Hong Kong have not been systematically described. The objective of the study was to analyse antibiogram data from private hospitals and describe the temporal trends of non-susceptibility percentages in this setting.

Methods: This retrospective descriptive study used antibiogram data from all private hospitals in Hong Kong that had been collected annually for 6 years (2014-2019). Data on six targeted bacteria and their corresponding multidrug-resistant organisms were included.

to 9% and 71% to 79%, respectively. These values generally were comparable with findings from public hospitals and Residential Care Homes for the Elderly in Hong Kong. However, the prevalences of carbapenem-resistant Enterobacteriaceae, which are increasing in Hong Kong and other nations, were also increasing in our dataset despite their currently low values (<1% for *Escherichia coli* and <2% for *Klebsiella* species).

Conclusion: The antibiotic resistance landscape among private hospitals in Hong Kong is satisfactory overall; there remains a need for surveillance, antibiotic stewardship, and other infection control measures.

HOW BAD IS ANTIBIOTIC RESISTANCE IN PRIVATE HOSPITALS?

HKMJ 2022;28:140-51

	In-patients								Out-patients							
	2014	2015	2016	2017	2018	2019	P value	Public hospitals	2014	2015	2016	2017	0218	2019	P value	DH
MRSA	22%	20%	19%	21%	19%	21%	0.2103	43.1%	18%	20%	16%	18%	19%	16%	0.0866	26%
ESBL E. coli	28%	28%	27%	26%	27%	25%	0.0012	26%	20%	20%	18%	18%	21%	20%	0.6201	17-18.6%
CR E. coli	0.2%	0.2%	0.1%	0.4%	0.7%	0.6%	<0.001		0.1%	0.0%	0.1%	0.4%	0.1%	0.3%	0.0158	
ESBL Klebsiella	17%	14%	13%	16%	15%	14%	0.2815	19-22%	14%	15%	16%	18%	13%	13%	0.6321	9.8%
CR Klebsiella	0.2%	0.7%	0.6%	1.0%	1.3%	0.9%	0.005	0.2-0.4%	0.3%	0.7%	0.4%	0.4%	0.4%	0.3%	0.6321	
MRPA	0.3%	0.0%	0.1%	0.0%	0.1%	0.2%	0.6367	0.02-0.06%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	
MDRA	7.8%	5.2%	2.9%	2.2%	2.7%	3.5%	0.0006	24-9%	4.5%	0.0%	2.0%	0.0%	0.0%	0.0%	0.0311	

World Health Organization
Western Pacific Region

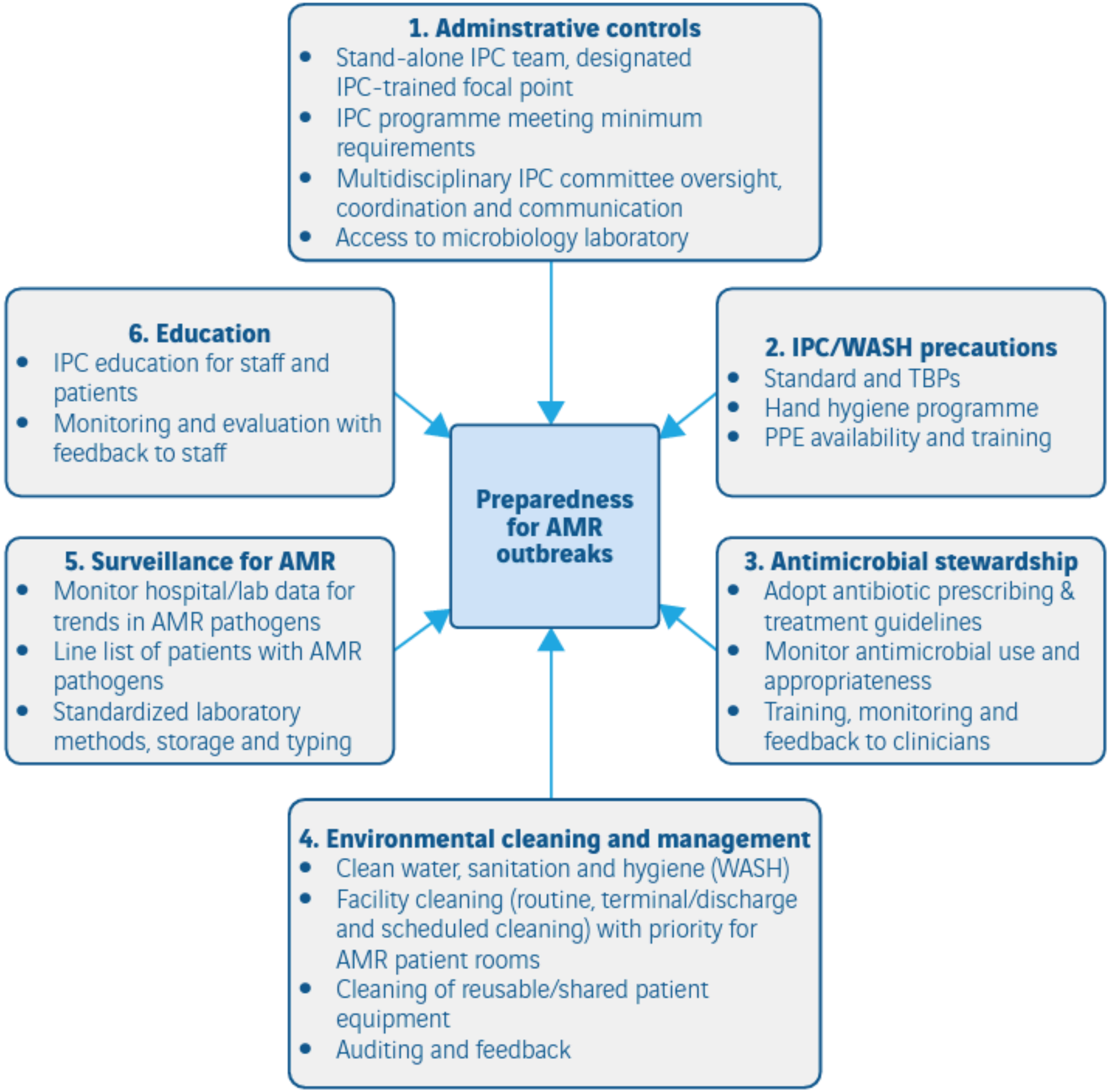
Responding to Outbreaks of Antimicrobial-resistant Pathogens in Health-care Facilities: Guidance for the Western Pacific Region

4. AMR PREPAREDNESS AND PREVENTION

HCFs can review their IPC programmes to focus on areas that could be improved to reduce the risk of AMR pathogen outbreaks

6 DOMAINS OF KEY COMPONENTS OF PREPAREDNESS FOR AMR IN HCFS

Fig. 6. Components of preparedness and prevention of AMR at the HCF level



KEY COMPONENT 1: ADMINISTRATIVE CONTROLS

Establish infection control committee (ICC) and infection control team (ICT)

- ICC composition…

Evidence-based infection control guidelines

KEY COMPONENT 1: ADMINISTRATIVE CONTROLS

Infection control education and training

HAI surveillance

- - CDC NHSN definitions
- - Absolute numbers and rates
- - Trend monitoring

Audit and feedback of infection control practices

- - Hand hygiene

Environment, materials and equipment for infection control

- - UV disinfection devices

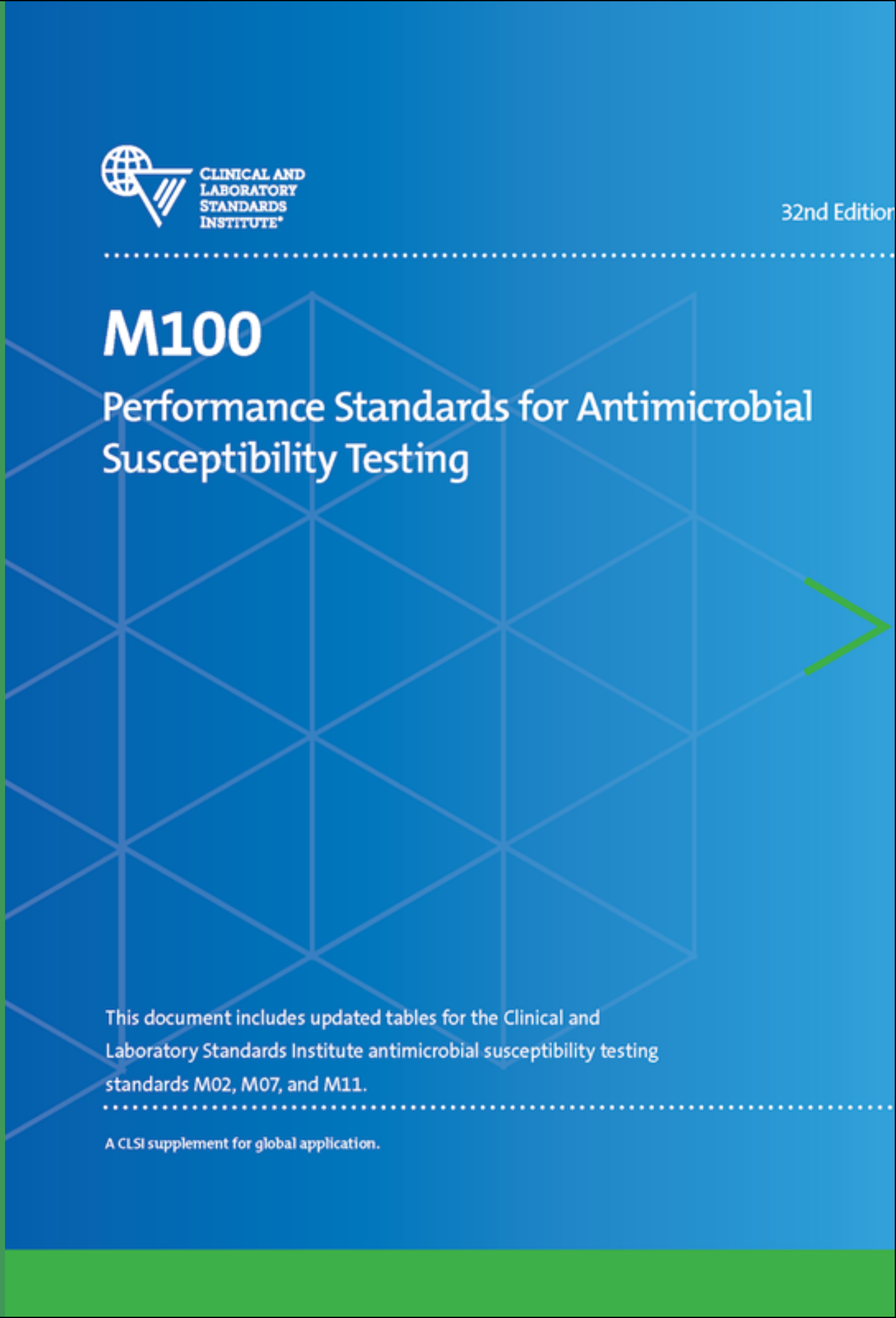
KEY COMPONENT 1: ADMINISTRATIVE CONTROLS

Workload, staffing and bed occupancy

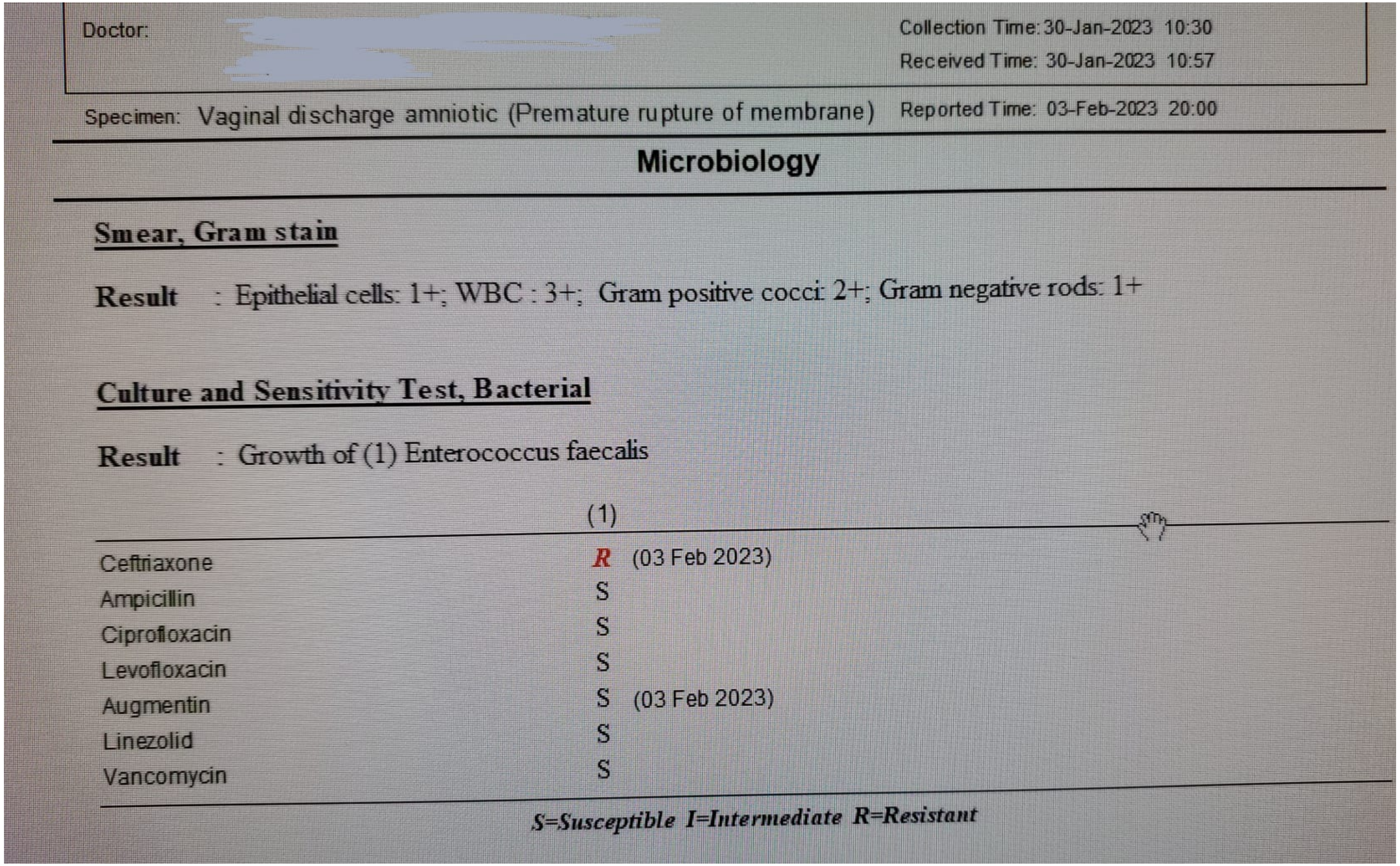
KEY COMPONENT 1: ADMINISTRATIVE CONTROLS

Provision of accurate AMR surveillance data by Microbiology lab

- Cascade reporting of antimicrobial agents
- Report clinically significant pathogens only



ROLE OF MICROBIOLOGY LAB



Doctor:

Collection Time: 30-Jan-2023 10:30
Received Time: 30-Jan-2023 10:57

Specimen: Vaginal discharge amniotic (Premature rupture of membrane)
Reported Time: 03-Feb-2023 20:00

Microbiology

Smear, Gram stain

Result : Epithelial cells: 1+; WBC : 3+; Gram positive cocci: 2+; Gram negative rods: 1+

Culture and Sensitivity Test, Bacterial

Result : Growth of (1) Enterococcus faecalis

	(1)	
Ceftriaxone	*R*	(03 Feb 2023)
Ampicillin	S	
Ciprofloxacin	S	
Levofloxacin	S	
Augmentin	S	(03 Feb 2023)
Linezolid	S	
Vancomycin	S	

S=Susceptible I=Intermediate R=Resistant

KEY COMPONENT 2: IPC/WASH PRECAUTIONS

Table 11. Standard and transmission-based precautions

Standard precautions Use for ALL patients at ALL times	Examples of transmission-based precautions (TBPs) Use standard precautions, PLUS	
• Hand hygiene • Appropriate use of PPE • Safe use and disposal of sharps • Routine environmental cleaning • Reprocessing of reusable medical equipment and instruments • Respiratory hygiene and cough etiquette • Aseptic technique, including safe injecting practices • Waste management • Appropriate handling of linen	**Contact transmission** *e.g. MRSA, CPE, VRE*	Gloves and fluid-resistant gown/apron Single room if high-risk for transmission, e.g. exudative wound for MRSA
	Droplet transmission *e.g. influenza*	Medical mask Single room if possible
	Airborne transmission *e.g. tuberculosis*	Respirator (N95, FFP2 or equivalent) Single, well-ventilated room where possible (negative-pressure ventilation, if available)


Highlights
Features
More Information
Contact Expert
Carbapenemase-producing Enterobacteriaceae (CF

COSTS

BACK TO MY PATIENT

Prolonged hospital stay

- Treatment of R renal and ureteric stone (JJ stent insertion + ESWL)
- Recurrent L pleural effusion (pleural tapping showed atypical cells)
- Aspiration pneumonia with FEES showing impaired swallowing
  - PEG insertion
- Sputum (January 2023): NDM-positive Klebsiella pneumoniae
- Contact precautions
  - Single room
  - PPE
- Explanation to relatives

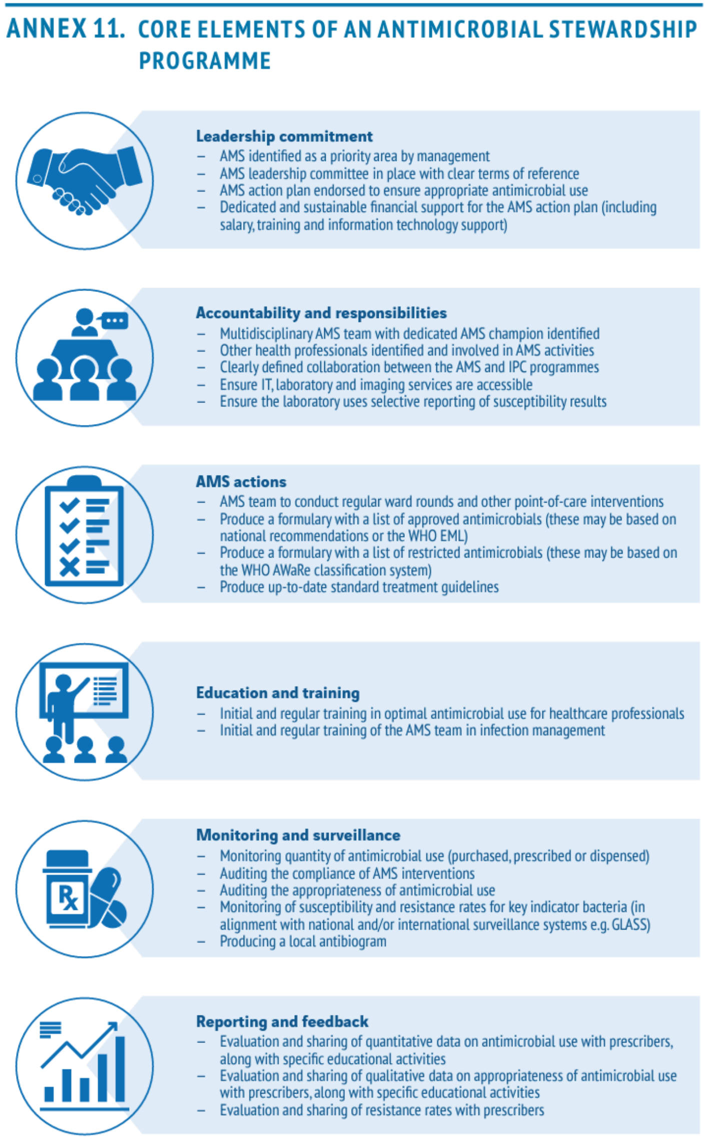
KEY COMPONENT 3: ANTIMICROBIAL STEWARDSHIP

Memo to prescribing doctors to indicate reason of prescription

Phone calls (from pharmacists) to doctors to remind on the choice of antibiotics

?Who to judge

?Patients paying at their own cost



KEY COMPONENT 4: ENVIRONMENTAL CLEANING AND MANAGEMENT

Training of staff

Appropriate design/engineering/construction

Adequate supply of disinfectant(s)

Policies and procedures and protocol

Monitor, feedback and audit

Bacteria	Abbreviation	Antibiotic Resistance
Staphylococcus aureus	MRSA	Methicillin-resistant
Enterococcus species	VRE	Vancomycin-resistant
Enterobacteriaceae (e.g., *E. coli/Klebsiella*)	ESBL	Extended-spectrum beta-lactamase produces resistance to penicillin/ cephalosporins
Enterobacteriaceae (e.g. *E. coli/Klebsiella*)	CRE	Carbapenem-resistance
Pseudomonas aeruginosa / Acinetobacter species	MDR	Resistance to three or more antibiotic classes

KEY COMPONENT 5: SURVEILLANCE FOR AMR

Routine collection and analysis of resistance patterns and /or incidence of pathogens of concern

- MRSA
- CPE
- VRE

Defined patient populations for screening

- Whole hospital
- ICU / SCU
- HD
- Patients with history

Reporting of unusual events*

UNUSUAL EVENTS

Sudden increase in MDROs

Clustering

KEY COMPONENT 5: SURVEILLANCE FOR AMR

Reporting in

- ICC meeting
- Nursing officers meeting
- Departmental meetings

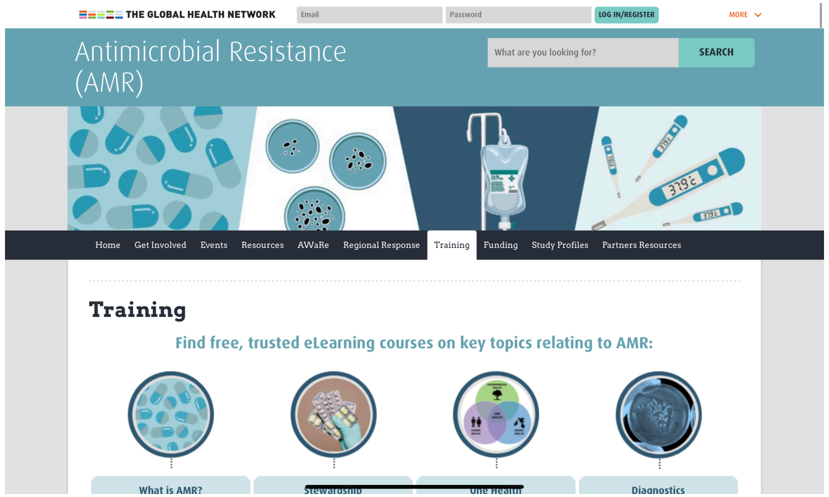
KEY COMPONENT 6: EDUCATION

Local IC practices

IPC precautions

Commencement of work + regular refresher courses

KEY COMPONENT 6: EDUCATION



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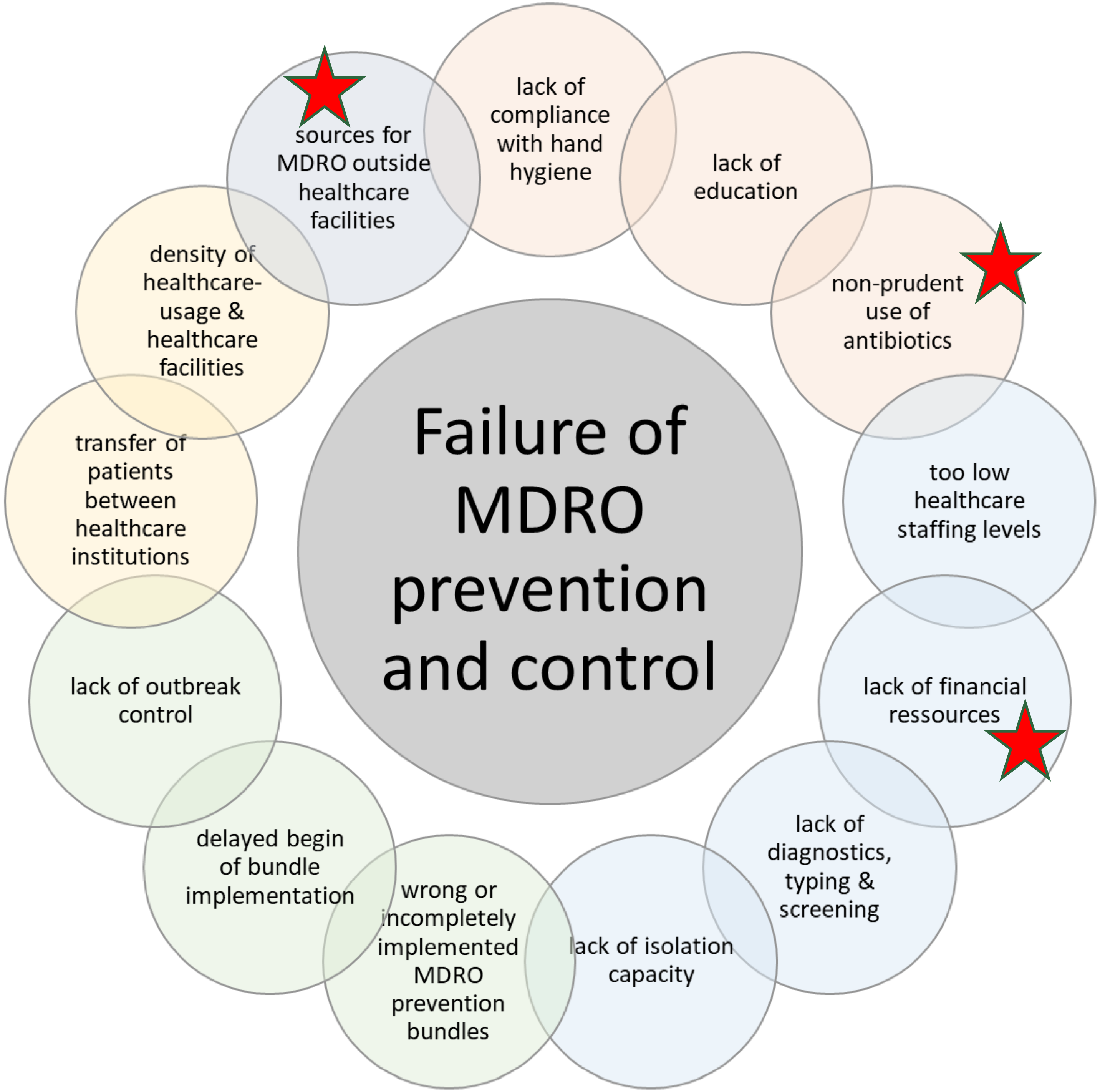
Seminar on Infectious Disease and Infection Control Management of Patients with Multi-Drug Resistant Organisms

Print

Topic	Seminar on Infectious Disease and Infection Control Management of Patients with Multi-Drug Resistant Organisms
Course Type	Web-based: Zoom Webinar
Content	• Explore the impact of COVID-19 pandemic on Multi-drug Resistant Organisms (MDROs) • Update knowledge on managing MDROs and preventing outbreaks of MDROs Poster
Date	17 February 2023
Venue	Zoom
Organizer	Co-organized by Infectious Disease Control Training Centre, Hospital Authority (HA IDCTC)/ Infection Control Branch (ICB), Centre for Health Protection (CHP) and Chief Infection Control Officer's Office, HA
Target Group	- Medical staff of related specialties including Infectious Disease, Clinical Microbiology, Intensive Care Unit, Pathology, Paediatrics, Medicine, A&E, Public Health, Community Medicine and Family Medicine and other physicians who are interested in the subjects


Failure of MDRO prevention and control
lack of compliance with hand hygiene
lack of education
non-prudent use of antibiotics
too low healthcare staffing levels
lack of financial ressources
lack of diagnostics, typing & screening
lack of isolation capacity
wrong or incompletely implemented MDRO prevention bundles
delayed begin of bundle implementation
lack of outbreak control
transfer of patients between healthcare institutions
density of healthcare-usage & healthcare facilities
sources for MDRO outside healthcare facilities