Antimicrobial Stewardship Program: Local Experience

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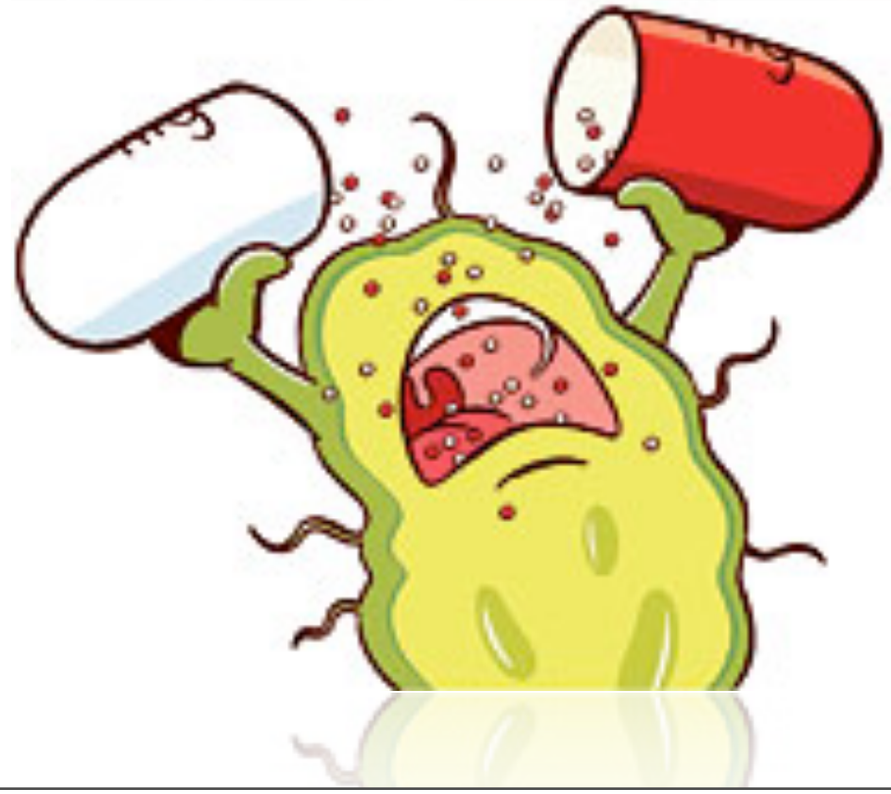
QUEEN ELIZABETH HOSPITAL SINCE 1963

- Is the largest hospital in Hong Kong
- Operates a 24-hour Accident and Emergency service and a full spectrum of specialist services.
- Provides medical care in both inpatient and specialist outpatient services.
- Is a referral centre of the major specialities

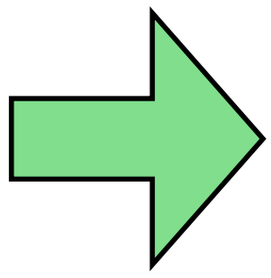

Thanks to PENICILLIN
...He Will Come Home!

Multiple resistant organisms

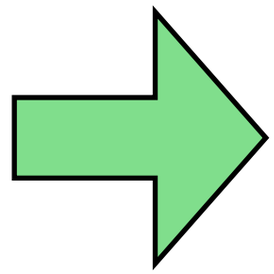
- VISA /VRSA
- VRE
- Multiple drug resistant *Pseudomonas aeruginosa*
- Multiple drug resistant *Acinetobacter Baumannii*



MDROs



MDROs



⇧Hospital stay

⇧Morbidity

⇧Mortality

⇧Cost

Tigecycline

Moxifloxacin

Doripenem

Cefepime

Azithromycin

Tazocin

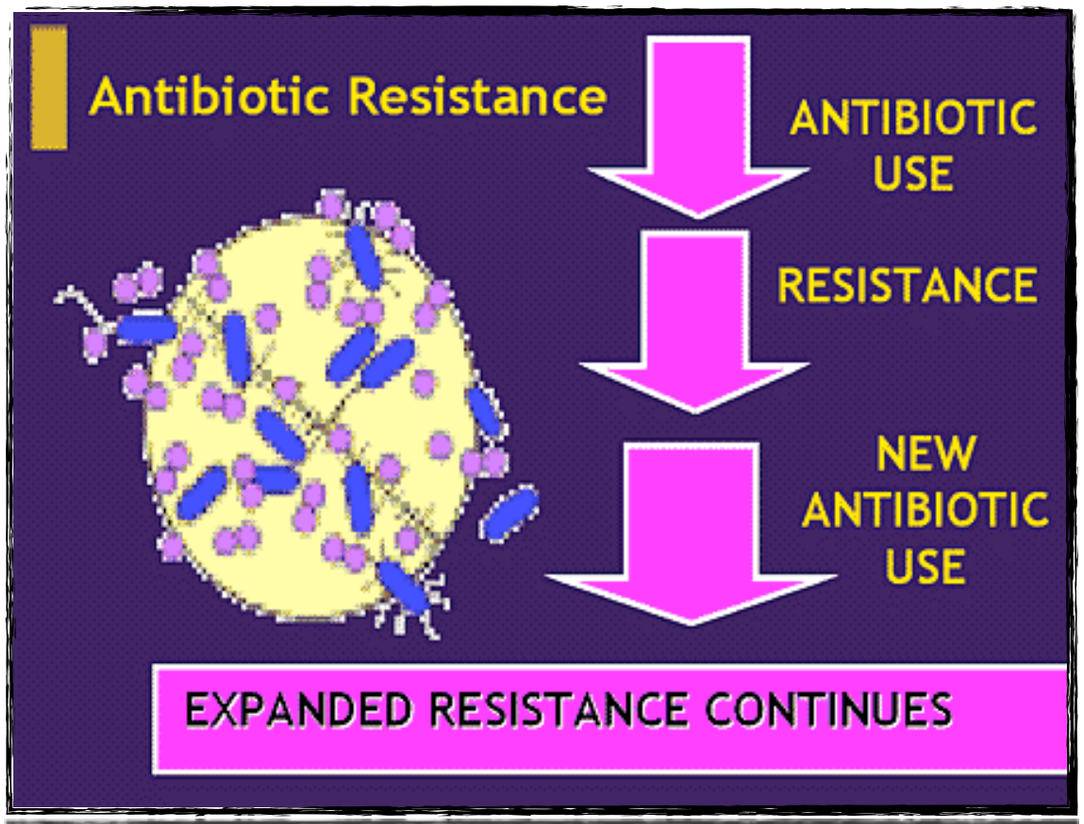
DEVELOPMENT OF NEW ANTIBIOTICS LAGGING BEHIND OF MDROS' DEVELOPMENT

Antibiotic History

Drugs	Year
Sulphonamides	1932
Penicillin	**1940**
Streptomycin	1944
Chloramphenicol	1947
Cephalosporin	1948
Erythromycin	1952
Vancomycin	1956
Nalidixic acid (1st FQs)	1962 (1970s)
Oxazolidinone (Linezolid)	1978 (2002)
Lipopetide (Daptomycin)	1980 (2003)

Antibiotic Pressure

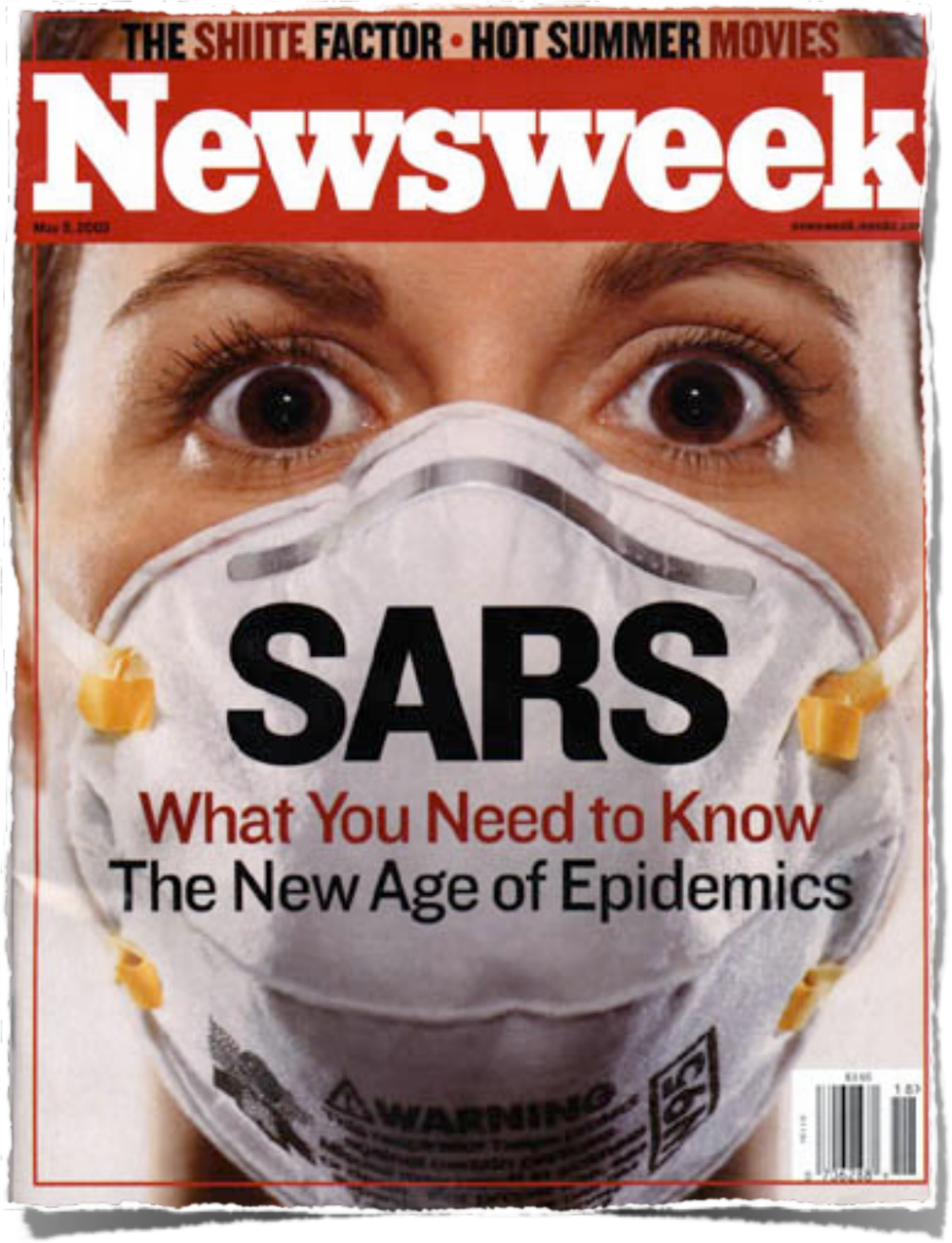
- **Antimicrobial Agent**
- **Resistance Gene**



Appropriate Antibiotic Use

- Not only to the total amount, but **how it is being used**.
- Inappropriate use of antibiotics will **select for bacterial resistance**.
- Excessive duration may exacerbate **disruption of the normal flora**

In 2003.....


THE SHIITE FACTOR • HOT SUMMER MOVIES
Newsweek
SARS
What You Need to Know
The New Age of Epidemics
WARNING

太陽報
宏泰道東方報業中心
-sun.com.hk
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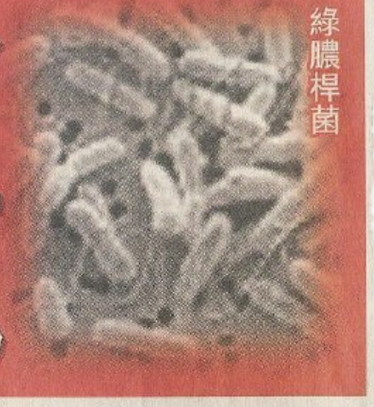
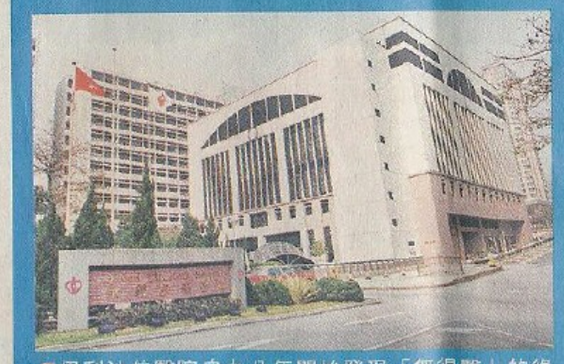
惡菌襲伊院


綠膿桿菌

百人中招 死亡率高


伊利沙伯醫院自九八年開始發現「無得醫」的綠膿桿菌肆虐。

在深切治療部的病人，最受綠膿桿菌的威脅。


綠膿

束手無策

全港最大的伊利沙伯醫院，六年前開始被「無藥醫」的綠膿桿菌入侵，先後有過百人懷疑於院內，染上這種可引致高死亡率肺炎和敗血病的惡菌，個案數目由九八年的一宗增至去年的八十四宗，今年亦有九宗個案，有病人疑染菌後病故。傳染病專家形容，這是「異常罕見」的爆發，「外國都未見過咁」，促請院方深入追查病源，以免置病人於危機中。

記者張意宇報道

伊院發言人承認，感染或帶有該菌多是一些病情嚴重

有票便是娘 民主黨政棍

Antimicrobial Stewardship Program in 2004..

Membership of ASP

Members	
Dr. Wu Tak Chiu	Division of Infectious Diseases
Dr. Dominic Tsang	Clinical Microbiology Consultant
Dr. Patrick Li	Medicine (Chief of Service)
Dr. C S Li	Drug and Therapeutic Committee (Chairman)
Dr. Wilson Leung	Clinical Pharmacist

Objectives

1. Optimizing choice and dosing of both empirical and definitive antimicrobial therapy

2. Improving hospital antibiotic resistance profile

3. Improving clinical outcomes of patients who require antimicrobial therapy

Strategies

1. Written Guidelines	IMPACT and Hospital guidelines
2. Educational Efforts	Teaching sessions
3. Providing ID consultations on the use of antibiotics	24hrs ID consultation service
4. Antibiotic susceptibility report	Restricted antibiotic susceptibility report
5. Restriction and audit of selected antimicrobial agents prescriptions	Restricted use of selected antibiotics Antibiotic Order Form Immediate concurrent feedback
6. Hospital Antibiotic usage and resistance monitoring	Monthly and annual antimicrobial usage report Hospital Antibiogram

Reducing bacterial resistance

with

IMPACT

Interhospital/ Multi-disciplinary Programme on Antimicrobial Chemotherapy

衞生防護中心
Centre for Health Protection

醫院管理局
HOSPITAL AUTHORITY

Centre of Infection
The University of Hong Kong

Third Edition (version 3.0)

Third Edition (version 3.0)

19 Targeted Antimicrobial Drugs

Anti-MRSA	
Vancomycin	Linezolid
Carbapenems	
Imipenem	Ertapenem
Meropenem	
Antipseudomonal	
Cefoperazpone/Sulbactam (Sulperazon)	Cefepime
Ceftazidime (Fortum)	Piperacillin-Tazobactam (Tazocin)
IV Fluoroquinolones	
Levofloxacin	Moxifloxacin
Ciprofloxacin	
IV Macrolides	
Azithromycin	Clarithromycn
Antifungal Drugs	
IV Fluconazole	Caspofungin
Voriconazole	
Others	
Tigecycline	Colistin

Outcomes

- **Patient Quality of Care:**
  - Mortality rates & ALOS of QEH medical patients with primary diagnosis of pneumonia
- **Antibiotic Resistance Trend:**
  - Microbiology susceptibility report on PA
  - Incidence of MRPA (multiply-resistant *P. aerugoinosa*)
- **Antibiotic Consumption:**
  - Cost (HK$)
  - DDD(Defined daily dose)/1000 patient-bed days

WHO DDD Definition

- Is **assumed average maintenance dose per day** for a drug used for its main indication in adults
- Not necessarily reflect the recommended or prescribed daily dose
- Give a **rough estimation of consumption**
- Fixed unit of a measurement **independent of price or formulation**
- Able to assess **the trend** in drug consumption and
- To perform **comparison** between the population groups

Departments

- Medicine
- O&T
- Surgery

Daily ASP Work-Flow

Prescriptions of antibiotics by in-charge doctors

Daily ASP Work-Flow

Prescriptions of antibiotics by in-charge doctors

▼

Antibiotic Order Form

▼

Pharmacy collects the AOFs

▼

Infection Control Nurse collects clinical information

▼

Case review by ID/Microbiologist

▼

Immediate Concurrent Feedback given if inappropriate

Antibiotic Order Form

Please Stick in Patient's Gum Label

Please Check Appropriate Boxes

☐ **PROPHYAXIS**
(No Infection Present)

☐ **EMPIRICAL THERAPY**
(Suspected Infection by Unknown Pathogen)

☐ **DOCUMENTED INFECTION**
(Known Infection & Pathogen Documente

☐ **Vancomycin IV / Teicoplanin:**
- ☐ β-lactam resistant Gram positive bacteria (e.g. MRSA, CoN Staph.) serious infections
- ☐ History of serious allergies to β-lactam antimicrobial agents
- ☐ **Other** (Please specify): _____

☐ **Imipenem (Tienam)** / ☐ **Meropenem (Meronem)**
- ☐ ESBL-producing bacteria infection
- ☐ Empirical therapy of neutropenic fever
- ☐ According to susceptibility test result for pathogens resistant to other antibiotics
- ☐ **Other** (Please specify): _____

☐ **Ceftazidime (Fortum)** ☐ **Cefepime (Maxipime)**
☐ **Cefoperazone-Sulbactam (Sulperazon)** ☐ **Piperacillin-Tazobactam (Tazocin)**
- ☐ Empirical therapy of neutropenic fever
- ☐ Pseudomonas aeruginosa infection
- ☐ According to susceptibility test result for pathogens resistant to other antibiotics
- ☐ **Other** (Please specify): _____

USE of ☐ **IV Fluoroquinolones (Ciprofloxacin or Levofloxacin)**
☐ **IV Clarithromycin (Klacid) or Azithromycin (Zithromax)**
☐ **IV Fluconazole (Diflucan)**

These antibiotics ORAL forms have very good oral bioavailability

Because:
- ☐ Oral intake or absorption is unreliable or impossible
- ☐ Fever /other clinical indicators of sepsis persists despite *correct* antibiotics
- ☐ Rapid drug penetration is necessary for the severe clinical condition
- ☐ Clinical condition requires IV administration: Please specify _____
- ☐ **Other**: (Please specify) _____

Signature of Medical Officer _____ Name: _____

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- □ **Other** (Please specify)**:** _____

Antibiotics Audit Form (For Official Use Only) (rev. 11 Nov 05)

Clinical Information					
Department:		☐General ☐Specialty (please specify:)			
Case M. O.		**Senior:**			
Date of Admission:					
Clinical Information and Underlying disease					
Immunocompromised?	☐**No**	☐**Yes** - ☐Transplant ☐ On long term steroid/immunosuppressants ☐HIV ☐Chemotherapy ☐Others ☐Specify: _____			
Ventilator: ☐Yes ☐No	**Inotrope:**	**OT:** Date:_____ Type:_____ ☐Urgent ☐Semi-urgent ☐Elective			
Category of infection	☐ Community Acquired	☐Hospital Acquired			
Organ/System Involved	☐Lung ☐Urinary ☐BSI ☐Intra-abdominal ☐IV catheter-related ☐PD-related ☐Wound ☐ CVS ☐CNS ☐Unknown/PUO ☐Others: _____				

Antibiotic Information				
Purpose of Antibiotics	☐Prophylaxis	☐Empirical	☐Known pathogen treatment	
☐ Not on antibiotic previously	☐ Switch from: _____			
☐ Concurrent Antibiotic(s):				
Name	Dosage	Frequency	Route	Starting Date
1				
2				
3				
Antibiotic Allergy Hx	☐No known antibiotic allergy ☐Unknown antibiotic ☐Yes, please specify: _____			

Laboratory results

Relevant Microbiology Results:

Date of collection	Lab#	**Specimen**	**Organism isolated**	Relevant ST
1				
2				
3				

Other Blood Tests (With Date):

WBC		N		Plt		ESR		CRP	
Cr		Ur		ALT		ALP		Bil	

Outcome Measures

☐ **Appropriate Indication**	*Remarks*
☐ According to ST	
☐ Immunocompromised	
☐ Nosocomial Infection	
☐ Empirical Treatment for Neutropenic fever	
☐ CAPD peritonitis	
☐ Recommended by Microbiologist/ID Physicians	
☐ Allergy History	
☐ Severe clinical infection	
☐ Failure of 1st line Antibiotics	
☐ Oral intake/absorption unreliable/impossible	
☐ Others:	
☐ **Inappropriate Indication**	*Remarks*
☐ No evidence of infection/ alternative Dx	
☐ Colonization/ Contamination	
☐ Redundant Combination	
☐ Inappropriate Route/ Dosage/ Choice (*please specify)*	
☐ Use as prophylactic agent	
☐ Others	

Immediate Concurrent Feedback to Prescriber? (if indication is inappropriate)

If YES:	**Suggestion**	☐ Change of Antibiotics: Route/ Dosage/ Choice: (please specify) _____ ☐ Stop Antibiotics
	Outcome	☐ Switch to the suggested antibiotics/ Recommendations followed ☐ Switch to other antibiotics (please specify): _____ ☐ Recommendations not followed i.e. no change of antibiotic ☐ Not applicable – patient transfer/discharge/death/treatment already stopped ☐ Others (please specify): _____
If NO:	**Reason**	☐ Not applicable – patient transfer/discharge/death/treatment already stopped ☐ Others (please specify): _____

Summary

- **ASP**:
  - Reduction of targeted antibiotic consumption
  - Control of MDRPA outbreak
  - Improvement of PA ST profile
  - Improvement of clinical outcomes and shortened ALOS of patients with pneumonia

Keys to success

- Blessing from top hospital management
- Multidisciplinary team
- Strategic approach
- Immediate Concurrent Feedback
- Manpower
- Continuous monitoring

Acknowledgement

- ASP Team
  - Dr. Dominic Tsang
  - Dr. Wilson Lam
  - Dr. Stephenie Wong
  - Dr. Chu Man Yee
  - Dr. Naomi Cheng
  - Dr. Wilson Leung
  - Dr. Christopher Lai
  - Ms. Kitty Ng
  - Ms. Doris Poon and ICNs

Thank You.