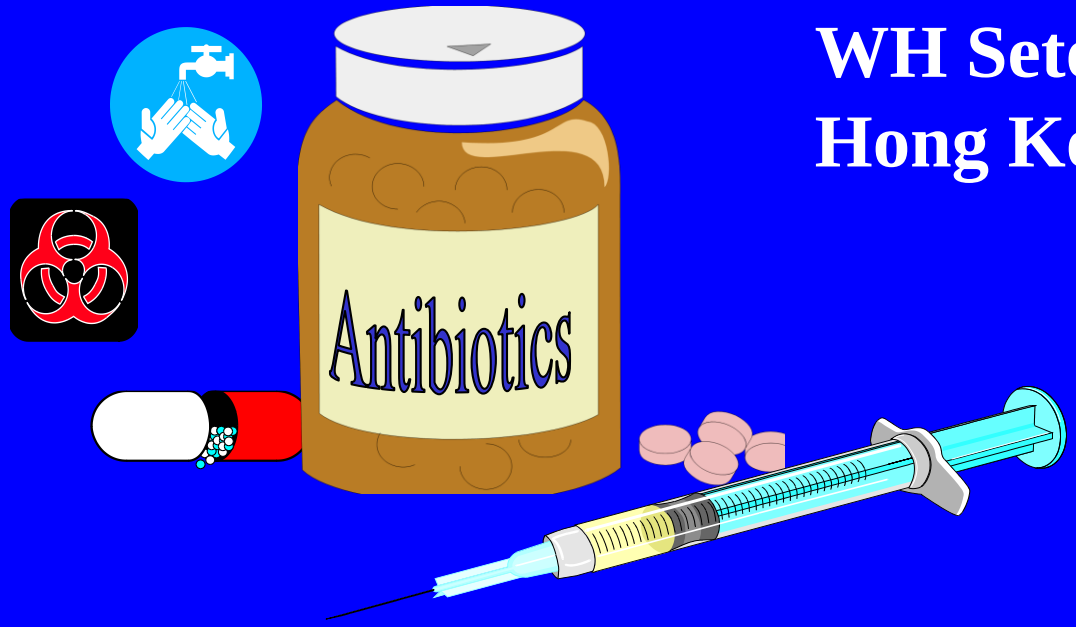
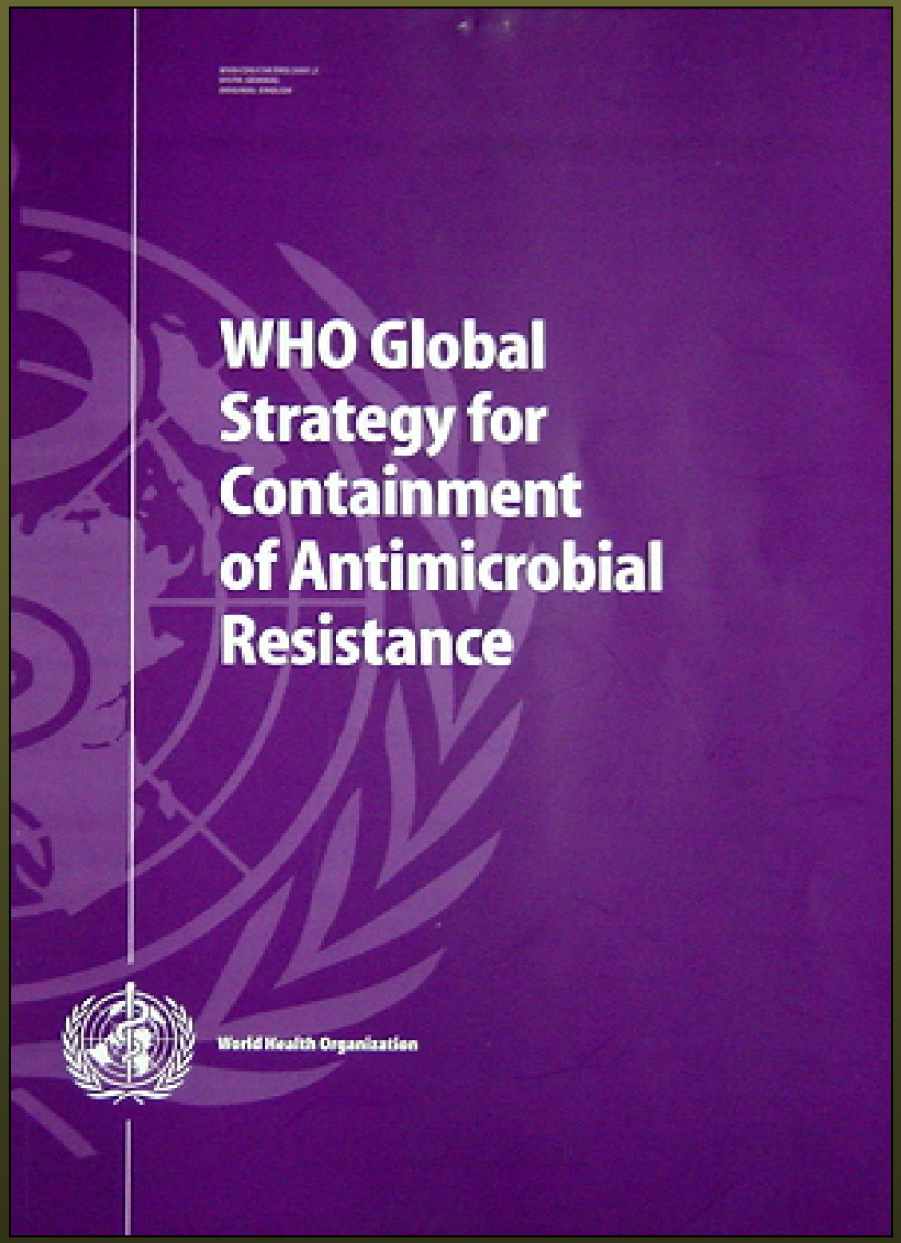
The Antibiotics Stewardship in **Hong Kong**



WH Seto,
Hong Kong, China



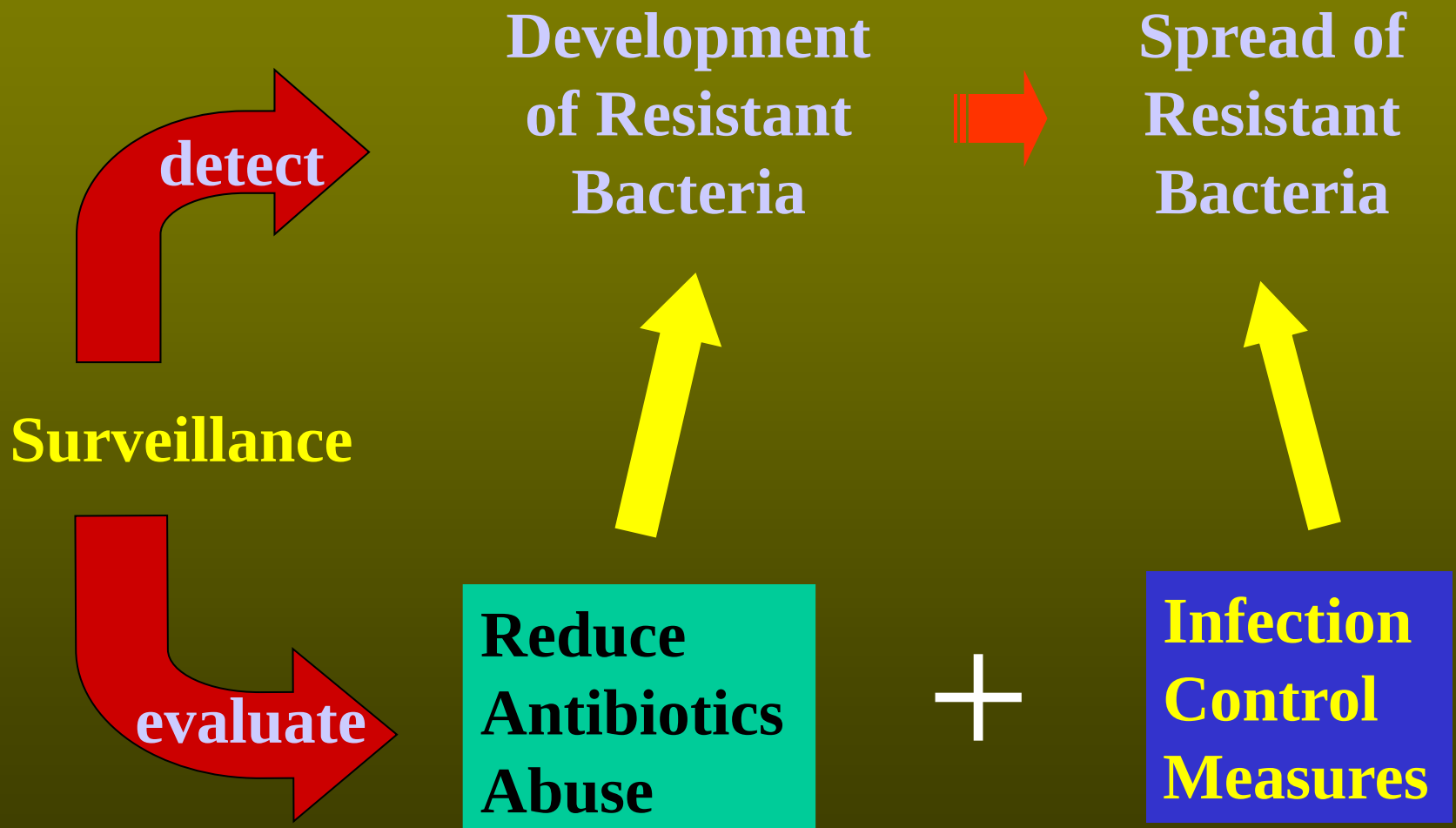
September 2001

"Antimicrobial resistance poses a global challenge"

"likely to result in the absence of effective therapies for some pathogens within the next ten years"

"Antimicrobial use is the key driver of resistance"

Control of Antimicrobial Resistance



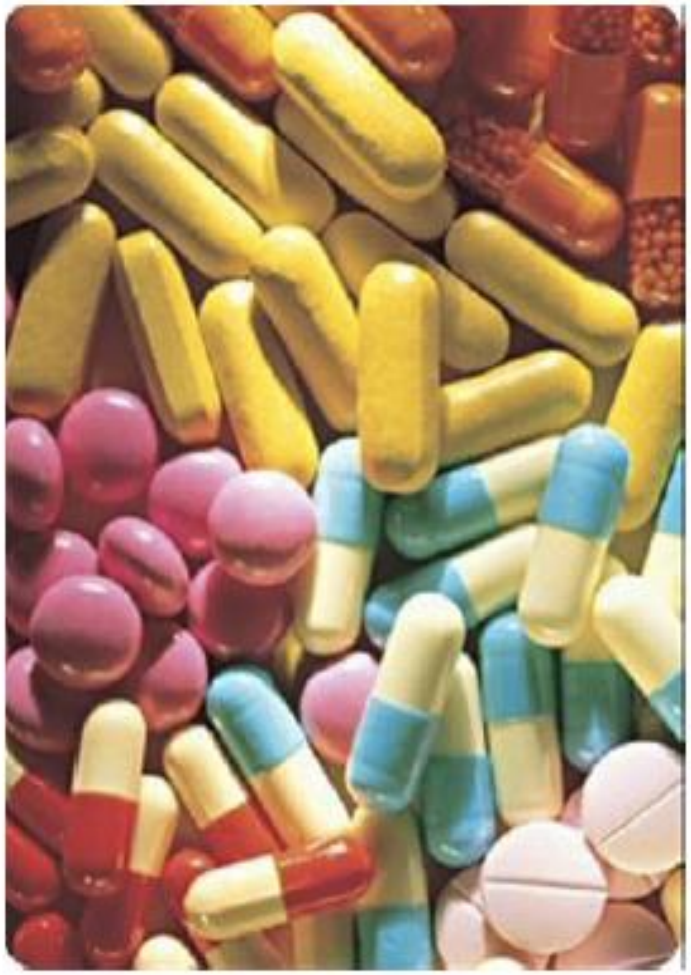
Antibiotic resistance – the three keys to control

- Infection Control
- Antibiotic stewardship
- Surveillance
  - Antibiotic-resistant bacteria
  - Antibiotic usage

Control of antibiotic resistance is like a three-legged stool – if you take away one of the legs – the whole thing falls over!

Antibiotic Stewardship - Definition

- The appropriate use of antibiotics and the limitation of unnecessary antibiotic administration/exposure
  - Optimising diagnosis
  - Selecting appropriate antibiotics
  - Optimal dosing



Antibiotics Utility Review Programme

Implementing antibiotics guidelines
Education Intervention:

- **Lectures and Teaching Programme**
- **Written manuals, newsletters and susceptibility patterns**

Education alone does not necessary work

- **The failure of Physician Education as a Cost Containment Strategy.**

  -Schroeder et al, JAMA

- **The Short and Long Term Effects of a Handbook on Antimicrobial Prescribing Patterns of antimicrobial therapy.**

  -D'Eramo et al, Infection Control

Effect was only sustained for 3 months

Restrictive Intervention

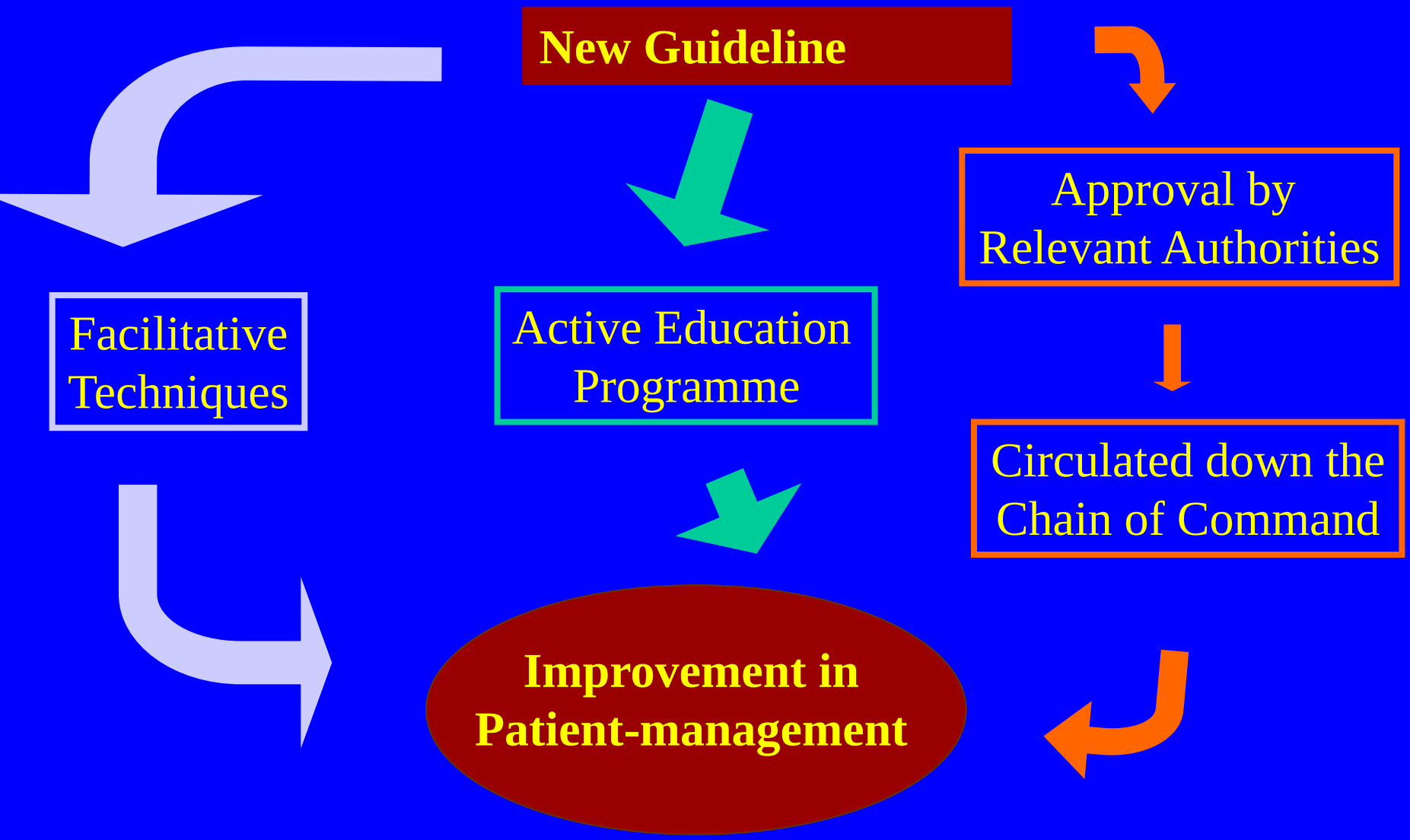
- **Formulary Restrictions**
- **Pharmacy justification**
  - Automatic stop policies
  - Antibiotic order form
- **Required Consultation and endorsement**
- **Therapeutic Interchange Programme**
- **Selective reporting of susceptibility tests**
- **Restriction of Interactions with Pharmaceutical Representatives**

On restrictive policies:

"These strategies are probably the most <u>onerous</u> to prescribing physicians ....."

John & Fishman, CID'97;24:471

Implementation of a New Guideline



Facilitative Interventions

1. Feedback non-generic and non-formulary drugs (Feely et al BMJ 1990).
2. Retrospective audits with feedback **(Am J Med '89;86:442).**
3. Interaction & feedback by professional team **(John et al CID '97;24:471).**
4. Computerized decision support **(Brent James, IMC).**
5. Interactive workshop **(Dwiprahasto, ICIUM 2004; O'Brien T, Cochrane Database of Systemic Reviews, Issue 4, 2002).**
6. Use of opinion leaders **(Everitt et al ICHE 1999, O'Brien T, Cochrane Database of Systemic Reviews, Issue 4, 2002).**
7. Concurrent feedback **(Anasari et al, JAC 2003:52:842)**

I.C.F.

Immediate - feedback occurs on day of audit

Concurrent - patient still in hospital

Feedback - specific for doctor & prescription

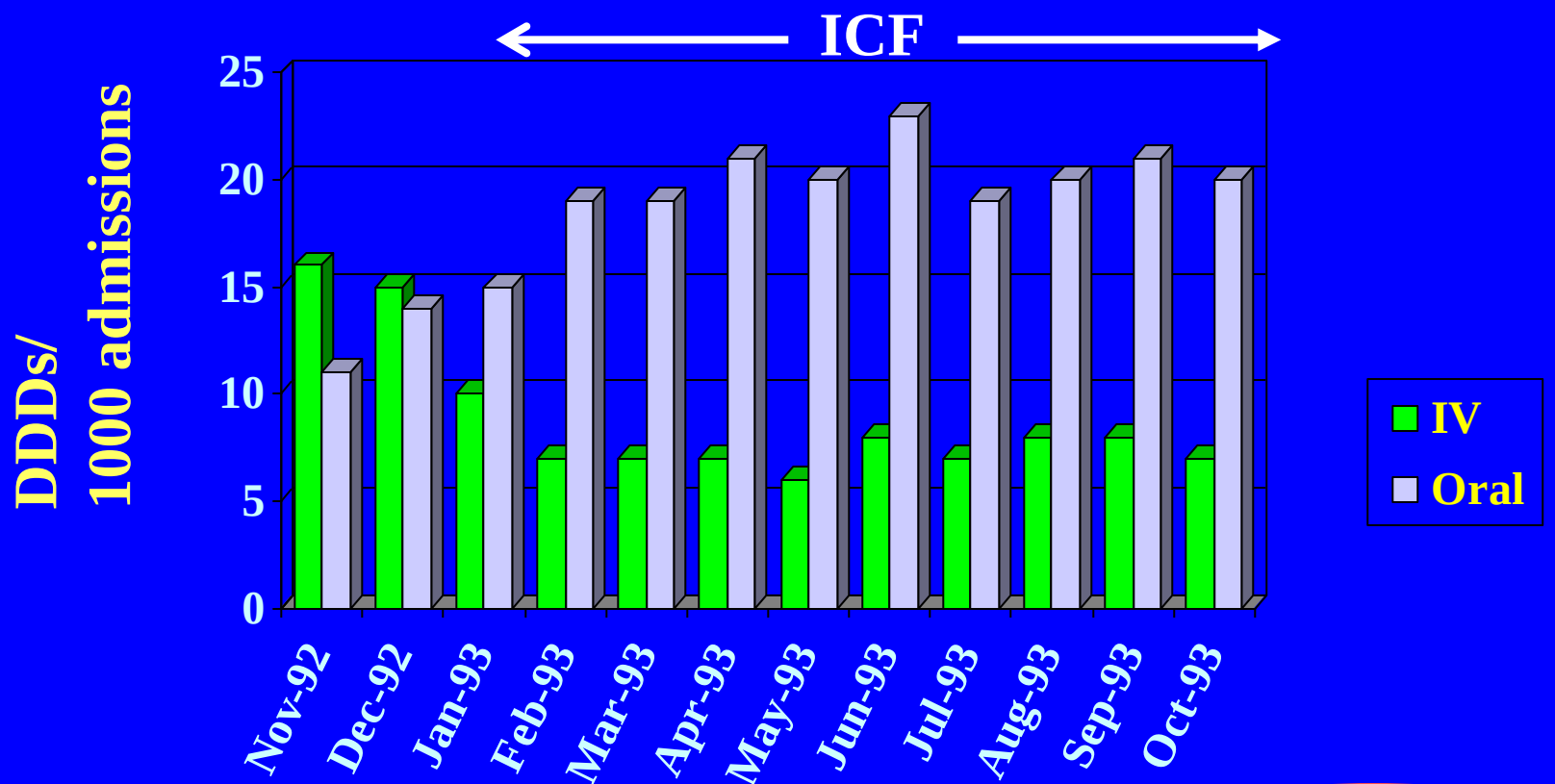
Help of an ICN & Pharmacy

I. C. F.


Hospital Approve Protocol
Pharmacy Generate Prescribers' List
Chart Review for Abuse
ICF By Letter

ICN

Usage of Co-amoxiclav/Sultamicillin in QMH



Save $360,000

Seto et al, BJ Clin Pharmacol 96;41:229

“Of interest in the Seto Study, feedback could be produced relatively inexpensively by a part-time nurse”

Hemeryck et al, BJ Clin Pharmacol 97:43:449

Patient admitted to the hospital are usually started on IV antibiotics therapy, then switched to equivalent oral therapy after clinical improvement (usually within 72 hours).

Advantages of early IV-to-PO switch programs include reduced cost, early hospital discharge, less need for home IV therapy and virtual elimination of IV line infections

There is no difference in clinical outcome using equivalent IV or PO antibiotics

C

CUNHA, 2012
New York

Principles in Surgical Antibiotics Prophylaxis

1. Not for clean operations except :
   - Prosthesis
   - Drastic outcomes if infected (eg.CNS)
   - High risk (eg. age or prolonged duration)
2. Whenever possible use first generation cephalosporin
3. Avoid antibiotics that are used for treatment
4. Given on induction
6. Post-operative coverage are generally unwarranted

What about at induction?

WHO
The panel recommends the administration of SAP within 120 minutes before incision,

ASHP

Summary of Key Updates. These guidelines reflect substantial changes from the guidelines published in 1999.[1] Highlights of those changes are outlined here.

Preoperative-dose timing. The optimal time for administration of preoperative doses is within 60 minutes before surgical incision. This is a more-specific time frame than the previously recommended time, which was "at induction of anesthesia." Some agents, such as fluoroquinolones and vancomycin, require administration over one to two hours; therefore, the administration of these agents should begin within 120 minutes before surgical incision.

Impact – HK guideline

Timing: For many prophylactic antimicrobial agents, the administration of an initial dose should be given within 30 minutes before incision…..
facilitated by having the anaesthesiologist administer the drug in the operating room at induction.

Result of education and ICF in the surgical unit

	>3 does post-op	use 3rd gen. Cephalosporin
July - Sept/92	65%	17%
---------- Education Programme ----------		
Oct - Dec/92	61%	26%
---------- Start ICF ----------		
January/93	30%	30%
February	26%	21%
March	18%	16%
April	14%	6%
May	12%	4%

Prophylactic use of antibiotics in QMH.

Estimation for 1991.

Total patients on surgical prophylaxis: 6188 patients

Assuming 40% usage is inappropriate: 2475 patients

Estimated cost of inappropriate use: $2.5 million.

Estimated savings if appropriate use: $2.1 million.

Guideline for Vancomycin usage

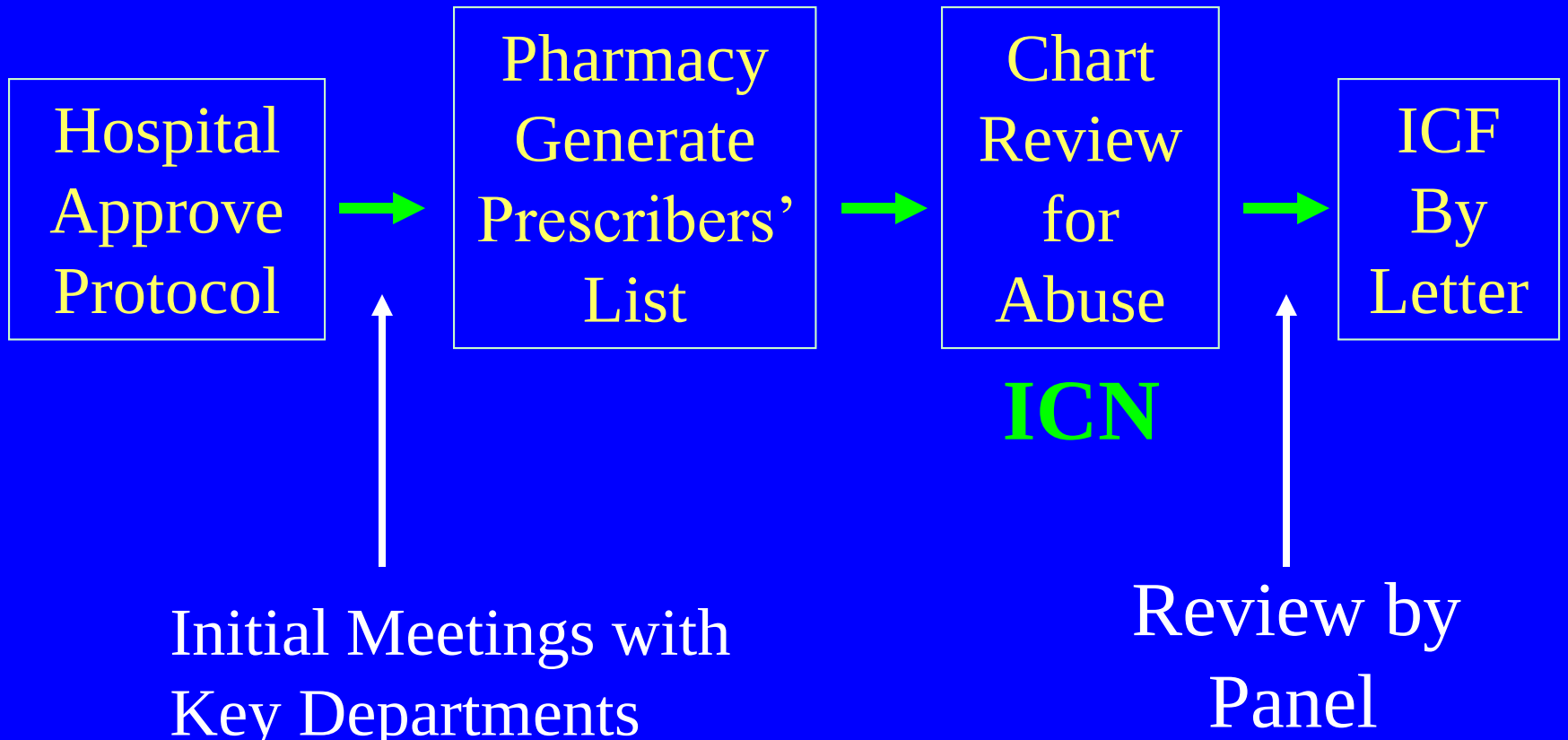
YES

1. Infections by β-lactam resistant gram+ve
2. Empirical Rx only for special patients at risk
3. β-lactam allergy with serious infections
4. AAC not responding to metronedazole
5. Surgical prophylaxis with prosthesis
6. Presumed pneumococcal meningitis

No

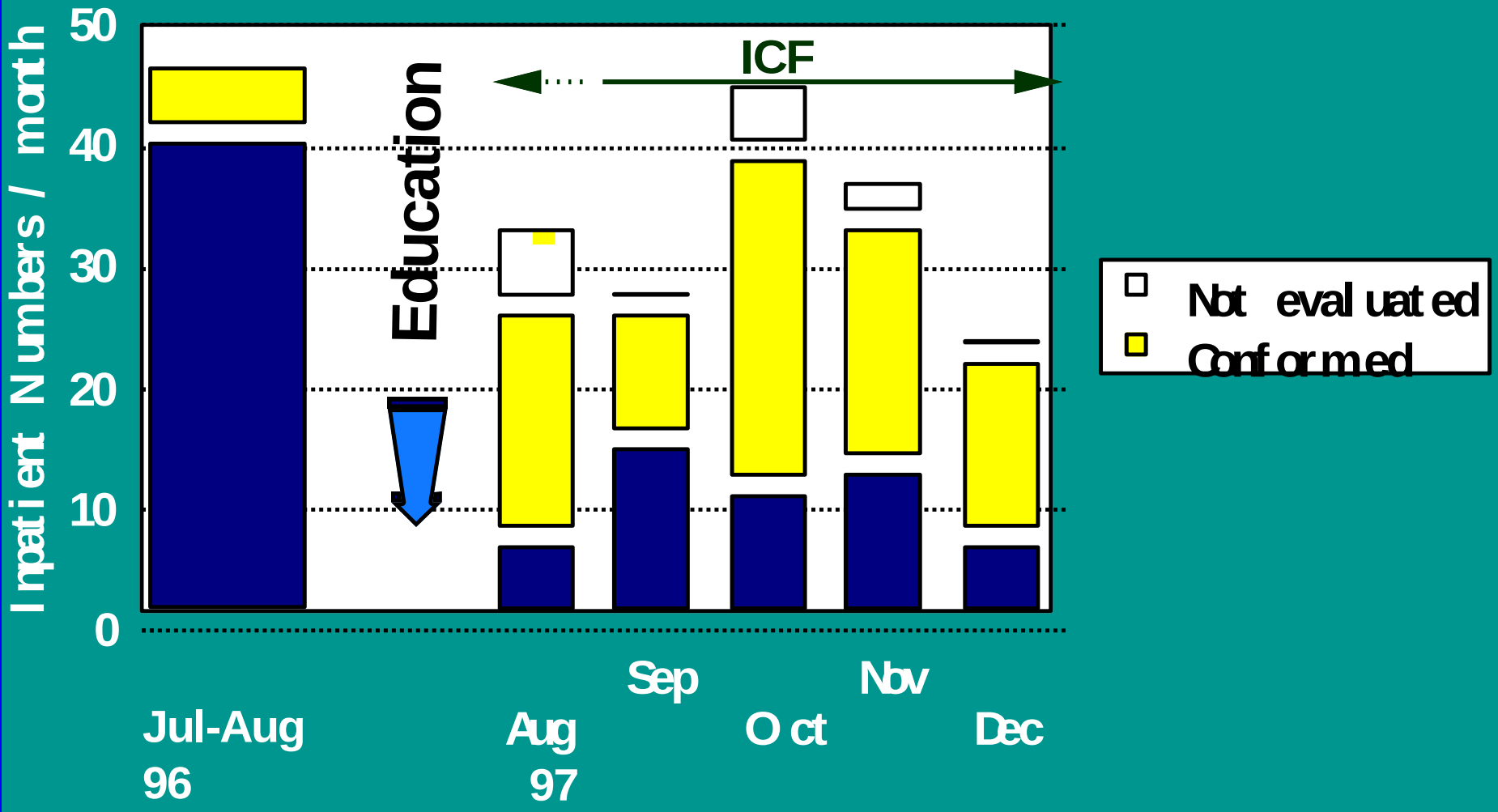
1. Most initial empirical Rx of neutropenic
2. 1 bld culture of CNS, Bacillus & Diptheroids
3. Rx of β-lactam sensitive organisms
4. Routine prophylaxis
5. Irrigation or topical application
6. Primary Rx of AAC

I. C. F.


Hospital Approve Protocol
Pharmacy Generate Prescribers' List
Chart Review for Abuse
ICF By Letter
ICN
Initial Meetings with Key Departments
Review by Panel

VANCOMYCIN OR TEICOPLANIN PRESCRIPTIONS

Depts' of Medicine (ex BMT Centre) + Orthopaedics & Trauma



The Five Big Guns

Meropenam
Imipenam
Tazocin
Cefepime
Ceftzidime

Later: + Sulfperazone

5 Situations in which "Big Guns" Antibiotic Prescribing is NOT ADVISABLE

- No evidence of infection eg colonization
- For chemoprophylaxsis
- For infection by pathogen that is susceptible to "Lesser Guns"
- In combination with other β-lactam "Big Guns" antibiotics

- Empirical treatment of community acquired infections (in non-neutropenic patients) except:

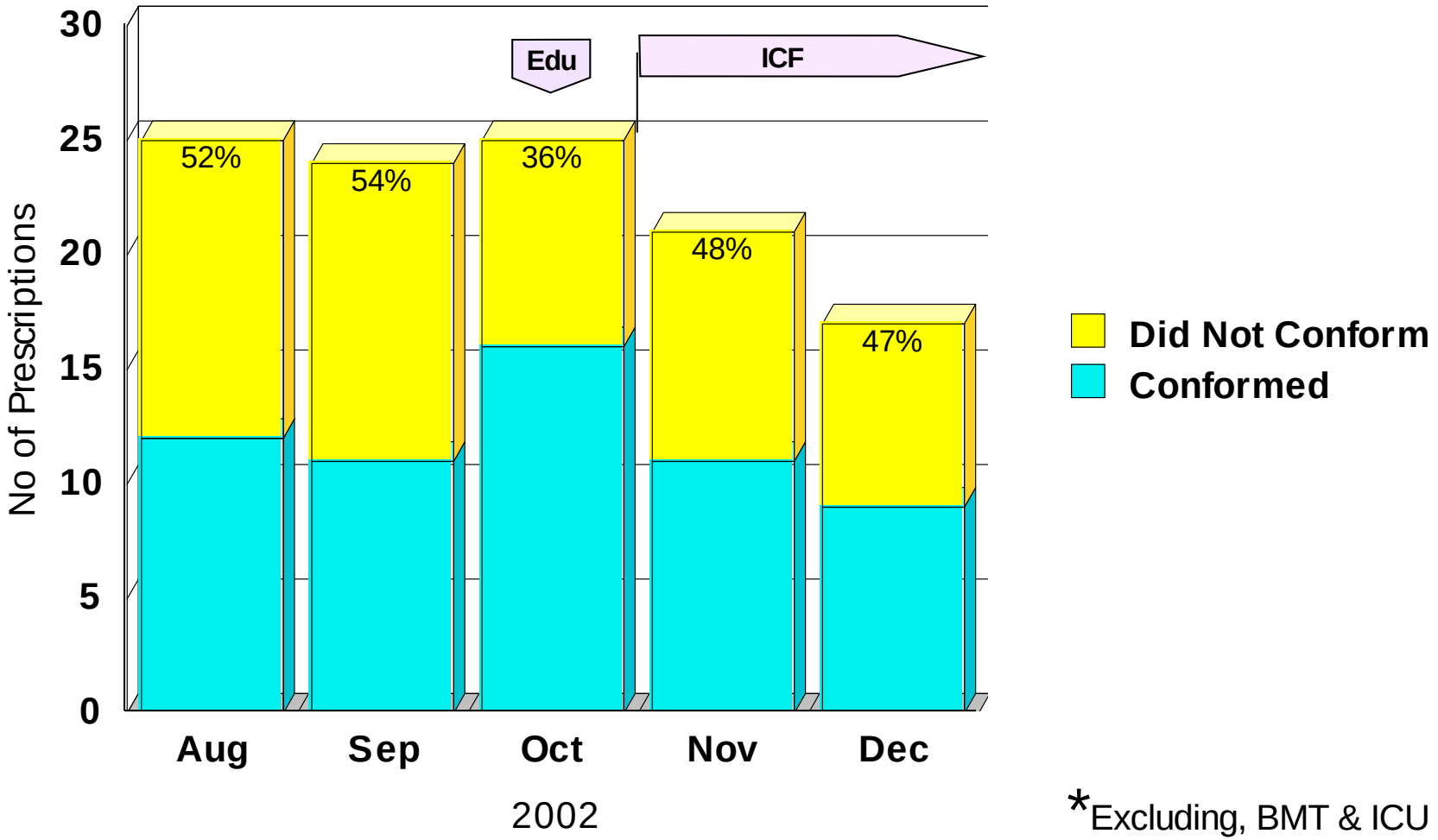
❖ Organ transplant recipients on high level immuno-suppression (ie prednisolone >30mg/day for 3 weeks or 10mg/day long term)

❖ Definite deterioration or persistent fever despite 72hr 1st line treatment

❖ Evidence of severe clinical sepsis (eg seriously ill CAP, haemodynamically unstable, meningitis, infective endocarditis)

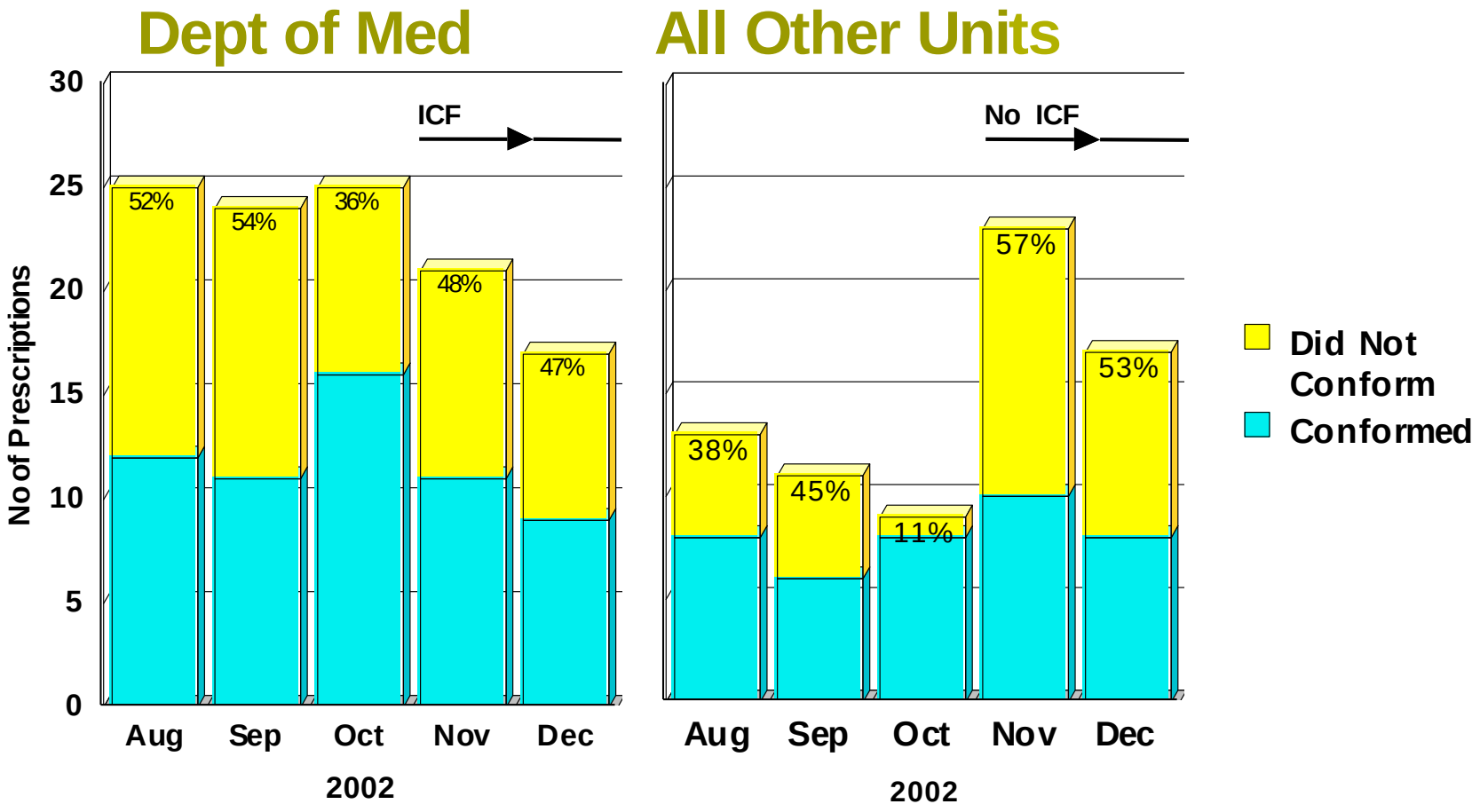
Audit of IV "Gig Gun" Antibiotic Prescribing

Preliminary Results: Dept of Med Wards* QM Hospital



*Excluding, BMT & ICU

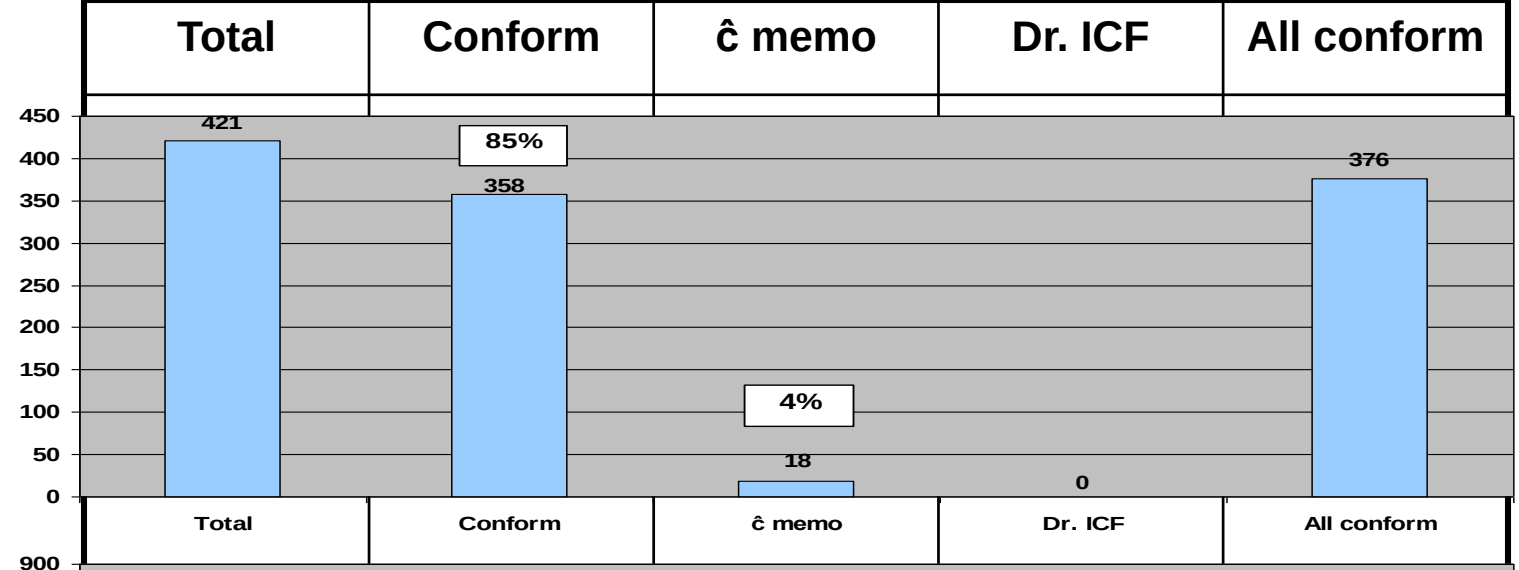
"Big Gun" Prescribing in Dept of Medicine Wards & All Other Depts of QM Hospital



Physician ICF – after initial ICN review

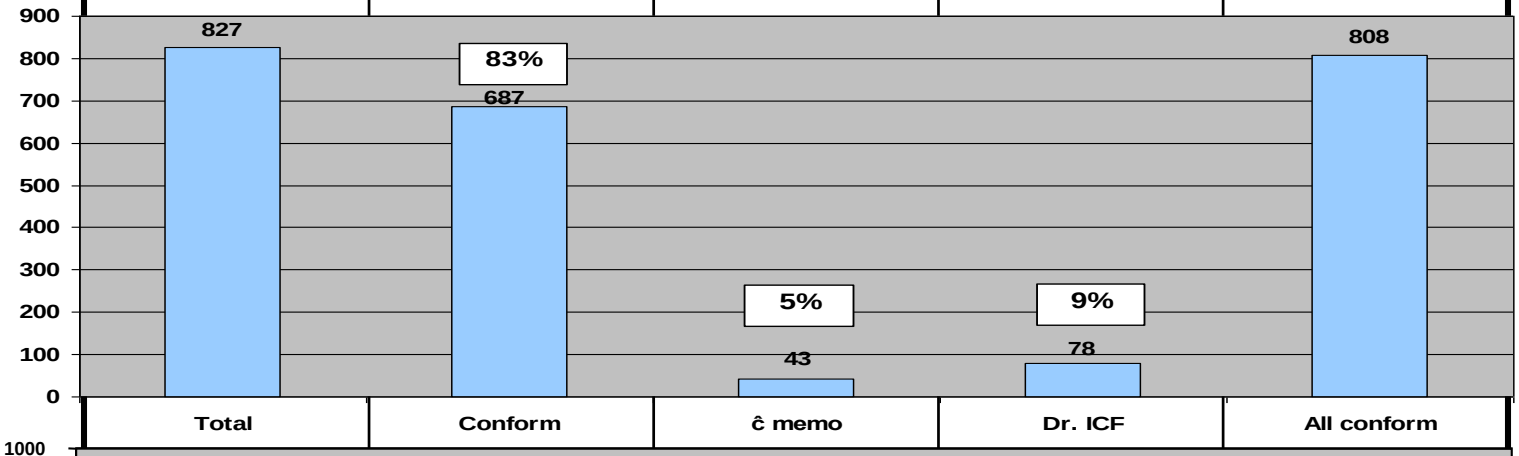
1. Non-severe nosocomial infections eg. nosocomial pneumonia < 5 days in Hospital + no previous admission.
2. Treatment duration eg. Nosocomial pneumonia ≥ 7 days **(unless Ps A or non-fermenters)**
3. Acute Pancreatitis – dealing with Imipenem (benefits found: Slavin et al Ar Sug 2001:386:155; Bassi et al JHP Surg 2001:8:211; Ratschko et al Gasto Clin Nam 1999:28:641; Sharma et al Pancreas2001:22:28)
4. Antibiotics for neutropenia/solid organ transplant
5. CAPD peritonitis – follow international protocol
6. PTBD – percutaneous transhepatic biliary drainage
7. Evaluation of critical vital signs and severe CAI
8. Patients on DNR.

Eur J Clin Microbiol Infect Dis
DOI 10.1007/s10096-009-0803-8



12/04 to 05/05

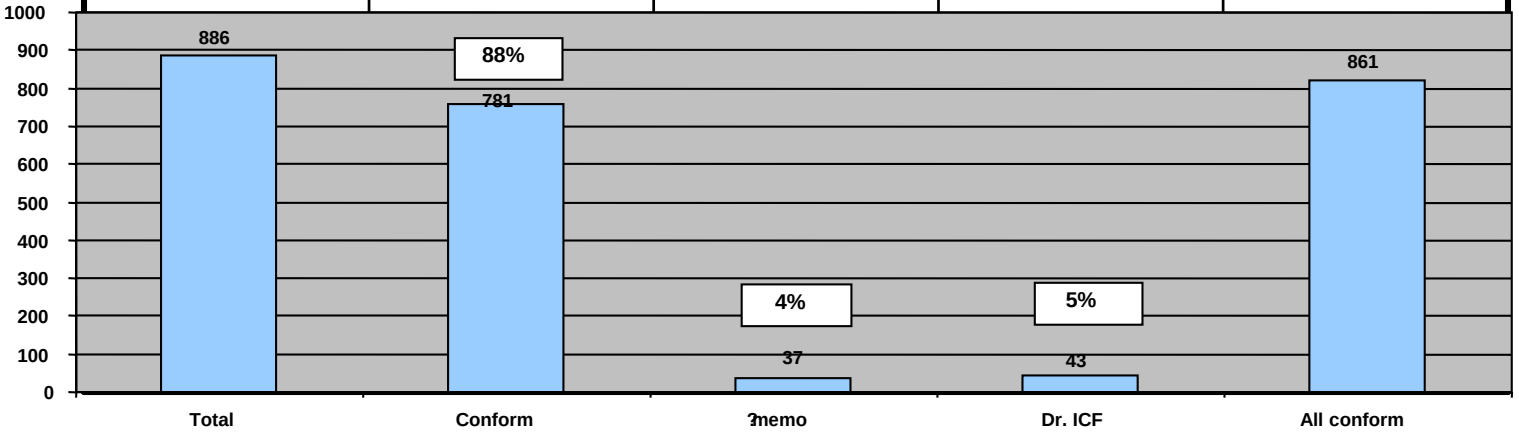
89%



06/05 to 11/05

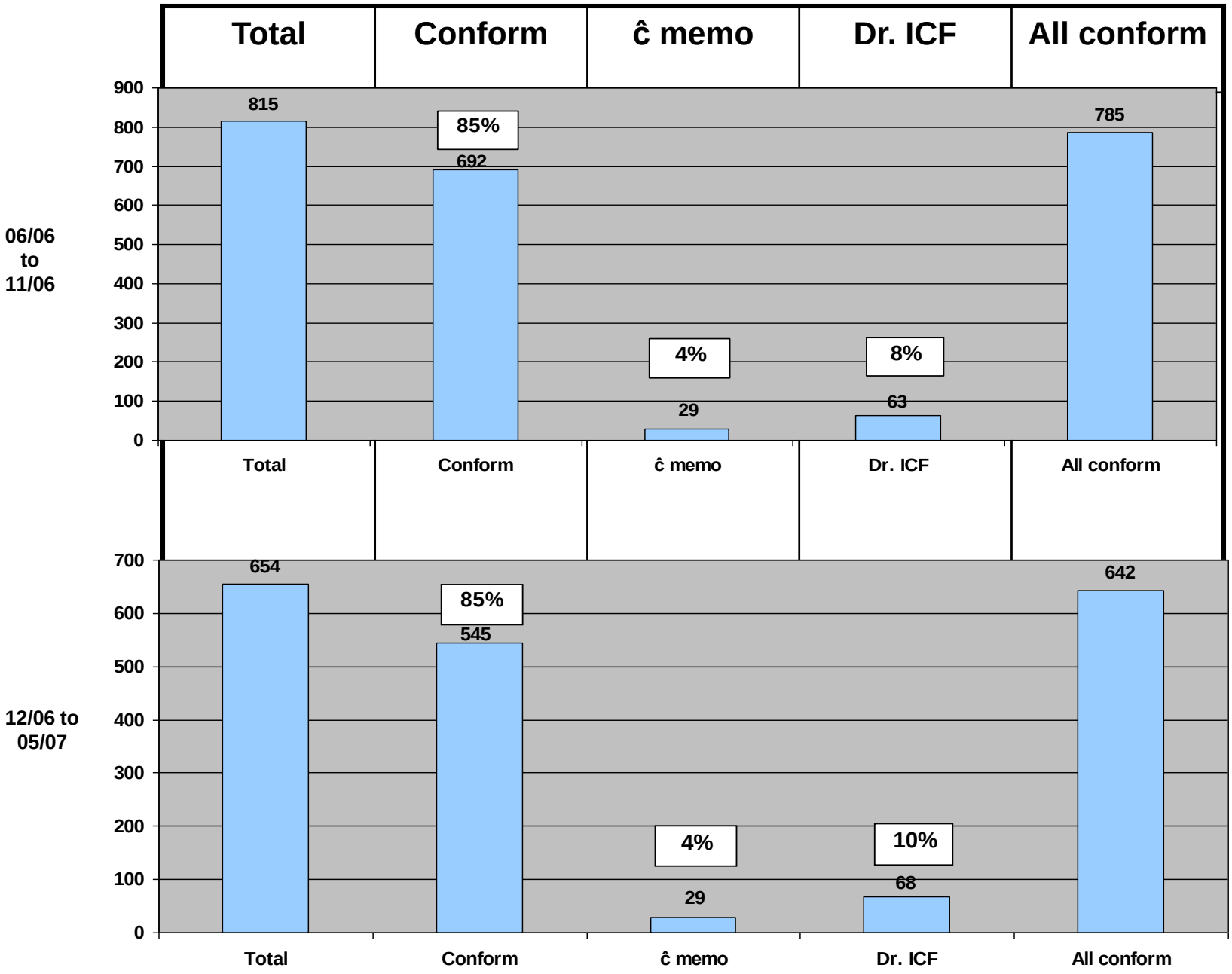
Whole hospital from 08/05

98%

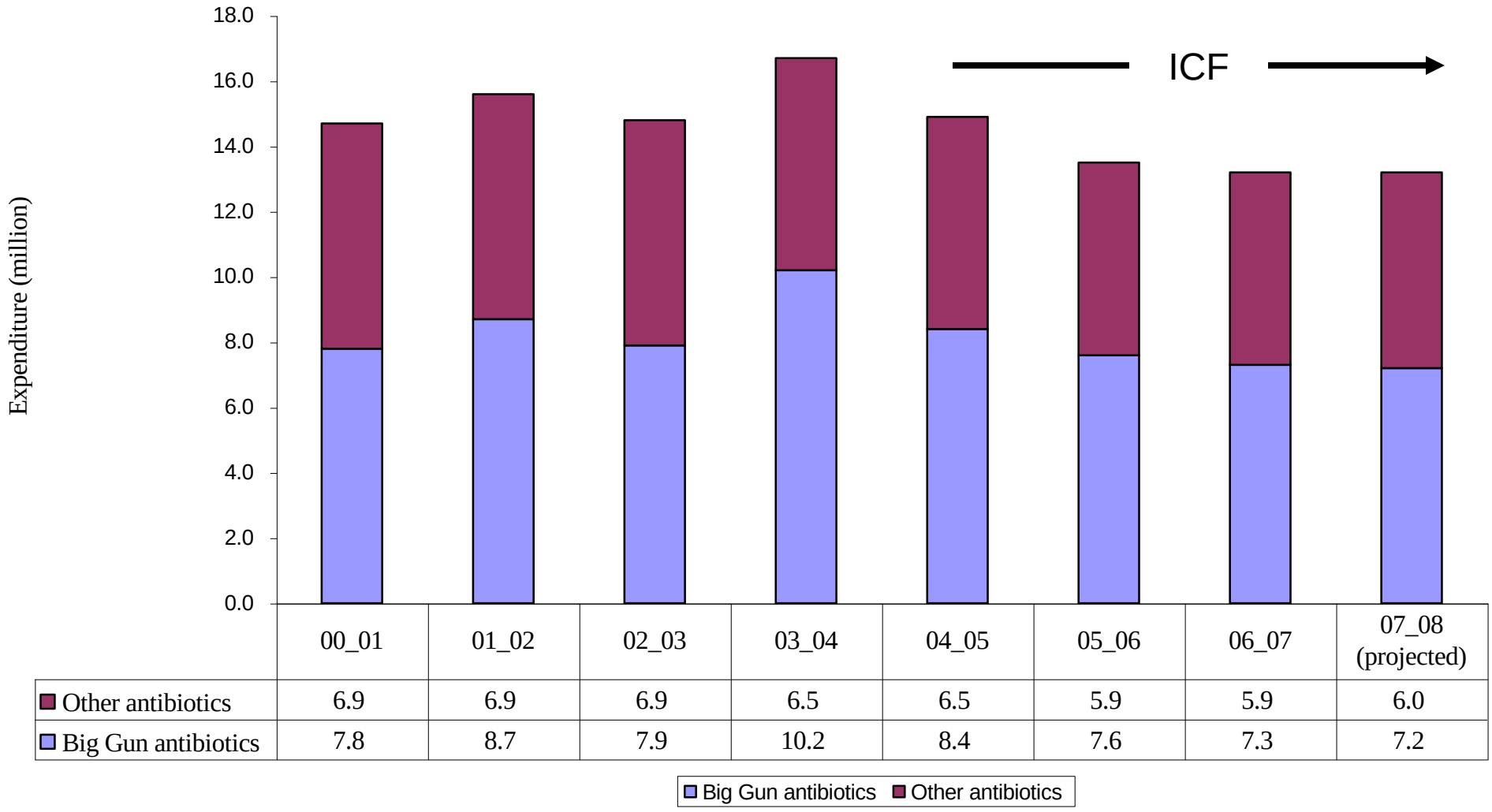


11/05 to 05/06

97%


Total
Conform
ĉ memo
Dr. ICF
All conform
06/06 to 11/06
900
800
700
600
500
400
300
200
100
0
815
85%
692
4%
29
8%
63
785
96%
12/06 to 05/07
700
600
500
400
300
200
100
0
654
85%
545
4%
29
10%
68
642
98%

Antibiotic expenditure in QMH



	00_01	01_02	02_03	03_04	04_05	05_06	06_07	07_08 (projected)
Other antibiotics	6.9	6.9	6.9	6.5	6.5	5.9	5.9	6.0
Big Gun antibiotics	7.8	8.7	7.9	10.2	8.4	7.6	7.3	7.2

Data from Pharmacy, QMH

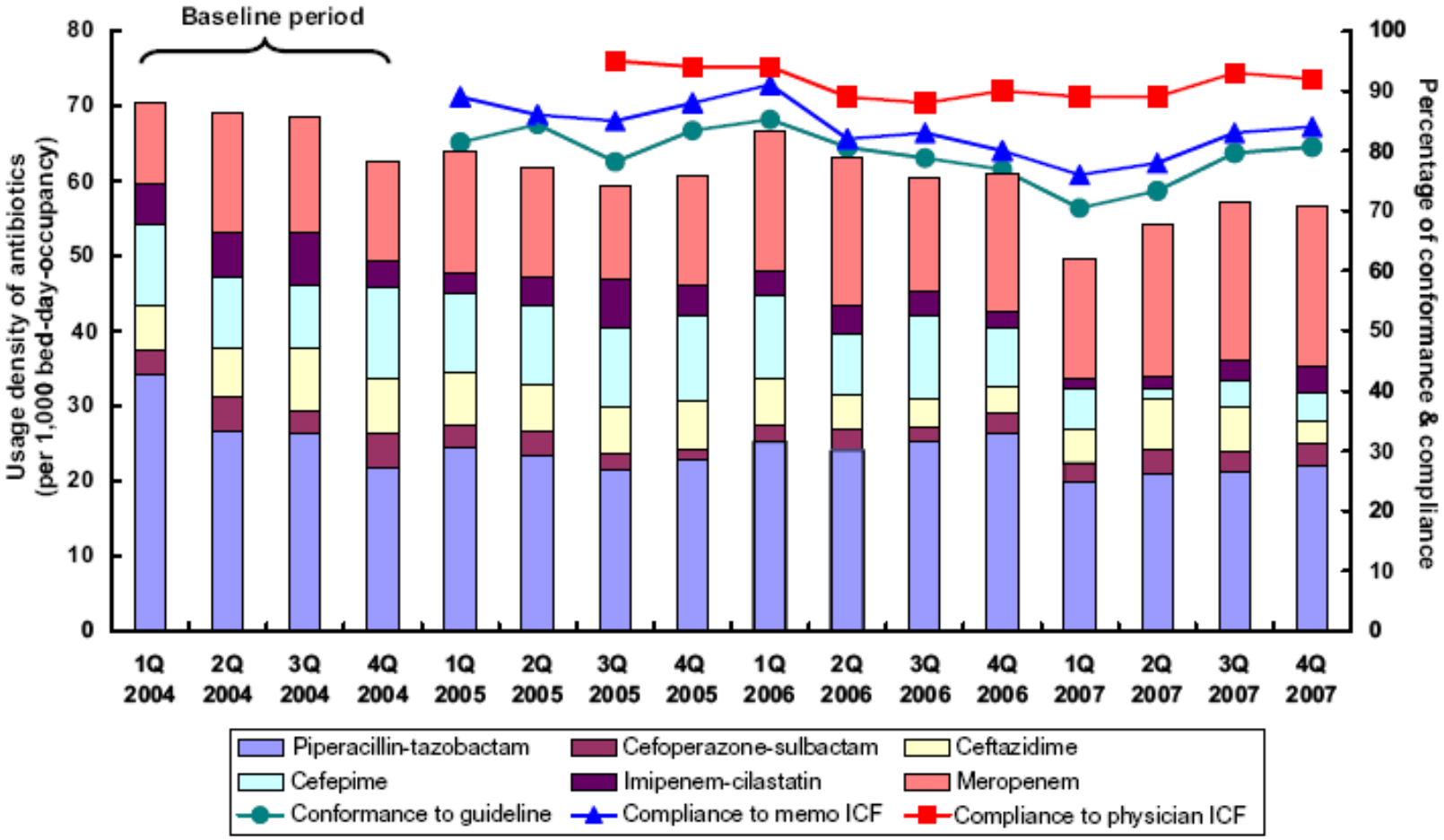


Fig. 1 Usage density of antibiotic, conformance to antibiotic prescription guideline, and compliance to the antibiotic stewardship program. Abbreviations: *1Q* first quarter, *2Q* second quarter, *3Q* third quarter, *4Q* fourth quarter, *ICF* immediate concurrent feedback

Eur J Clin Microbiol Infect Dis, 2009;28:1447

Just don't smile at the wrong time……..