

Institutional Antimicrobial Stewardship : Policy to Implementation

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2013- The need and initiation

- Expression of interests from fellow clinicians
- An informal survey of antimicrobial prescriptions in the hospital
- Setting up a system for antimicrobial stewardship tailored to the peculiarities of our healthcare settings

High patient load

Lack of electronic prescriptions

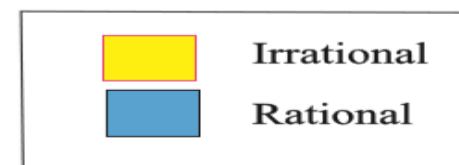
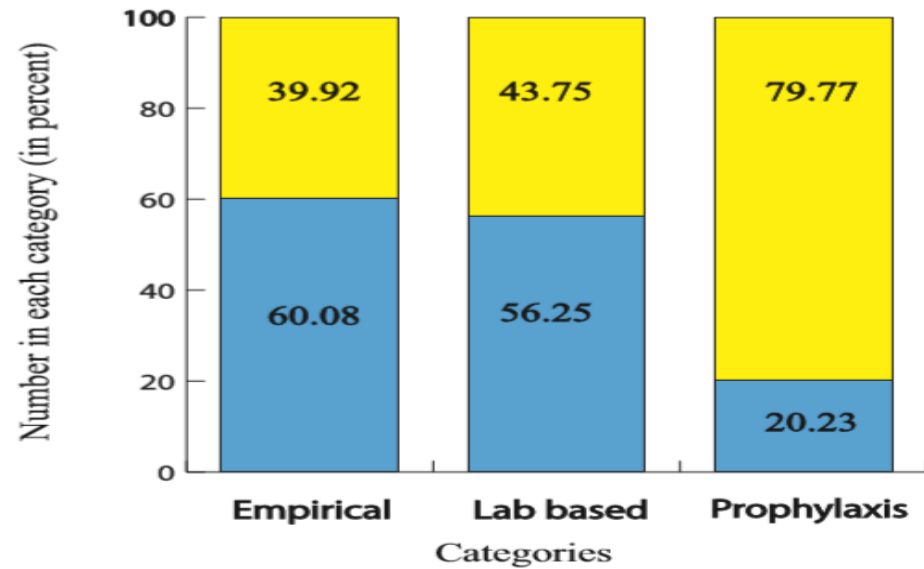
Resource limitations

Lack of Standard Treatment Guidelines

Lack of in hospital pharmacies

Absent or irregular antibiograms

Analysis of the problem





Background
Work

Policy

Refinement

1. Leadership Commitment

- Institute /Health Care Setting Level

Sparse

On paper vs real

What is Needed?

- Commitment for Allocation of Resources
- Office Orders

2. Composition of Antimicrobial Stewardship Committees

- ID Physician/Team approach
- Pharmacologist/Pharmacist
- Microbiologist/Lab technician
- Hospital Administration
- Nursing Practitioner
- Surgeon
- Internist/Intensivist
- Community Medicine Specialist?

What is needed?

- Commitment from Institutional / Organizational Heads to constitute the committees
- Availability of resources to the committee
 - ✓ Monetary
 - ✓ Man power
 - ✓ Space

Composition of Antimicrobial Stewardship Committee

- Chairperson (Surgeon, Prof Gupreet Singh)
- Convener (Clinical Pharmacologist, Dr Nusrat Shafiq)
- Members
 - Microbiologists (Prof Pallab Ray, Dr Vikas Gautam)
 - Clinical Pharmacologist (Dr Nusrat Shafiq)
 - Physician (Dr Ritesh Agrawal)
 - Hospital Administration (Dr Pankaj Arora)
 - Pediatrics (Prof Jayashree Muralidharan)

Desirable Attributes

Affected

Effectuated

Innovate

Management of meager resources

Readiness to devote time

Some grounded , some trumpeters

Nurses, Behaviour Scientists

Modus Operandi

- Regular meetings of members
- Extended meetings
 - Surgical Prophylaxis Discussion
 - ICU guidelines
 - Focused group educational activities
 - Visitors , Neighbouring Institutes
- Minutes communicated for action items

3. Interventions for ASP: Understanding what may work for us

- Off the shelf?
- Off the shelf with modification?
 - Prospective audit and concurrent feedback
 - Experience sharing
 - Audit and Infection Control
 - Formulary restriction
 - Bite size take home
 - Guidelines : tabulated summaries, handbooks

What is needed?

- Research into intervention strategies
- Setting up benchmarks

Tailoring interventions to the local settings

Lack of electronic prescriptions

High patient load- Overcrowding, Doctor to Patient Ratio

Resource limitations

Lack of support for Dose Optimization

Over the Counter Medications Lack/ Limited awareness of STG

Inadequate Infection Control Practices

Lax Regulations

Existence of irrational combinations

Diagnostic Support

Inadequate Infection Prevention Measures

Lack of in hospital pharmacies

Absent or irregular antibiograms

Inadequate awareness

Inadequate training in rational prescription

Using diagnostics appropriately

Generating/Using evidence

'Subway Approach'

Advance Trauma Center

PGIMER, Chandigarh, India

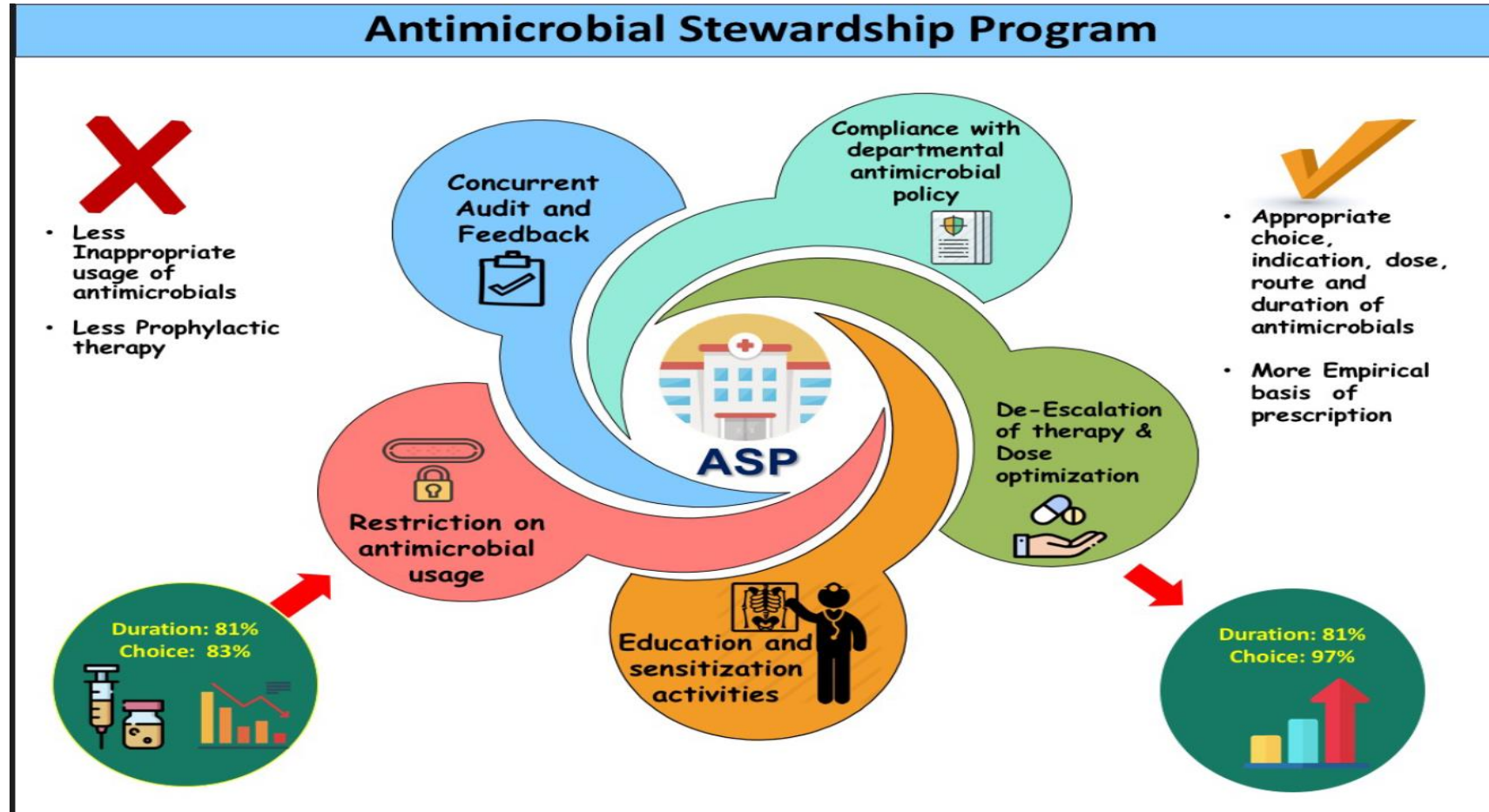


Figure Courtesy: Madhur Varma, PGIMER

Nudges are extremely important

- Forms for data capture
- Changes in case files and treatment charts
- Groups on mobile phone- Ongoing feedbacks
- System for dosing consultations
- Meetings with welcome all approach
- Bite size classes
- Dual strategy
- Using POC diagnostics for de-escalation
- Inviting infection control workforce for meeting
- Pooling in resources
- Feeder departments, referring institutes
- Access based forms

Development of Data Record Form (DRF)

Incorporated into patient files
Ongoing work for version 5

Version-5

PRESCRIPTION AUDIT (ANTIBIOTIC): PHARMACOLOGY

Individual ID: Age: (in yrs/mnths/days) Gender CR No

Date of first filling the form Bed No Point of Origin Admission No

Weight (kg/g) Serum Creatinine Consulting Incharge

Date of Discharge Date of Admission

1. Diagnosis

a) Provisional/ Definitive

b) Co-morbid illness

c) History of antibiotic use for current episode/preoperative/intraoperative antibiotic(s)

Dose/Frequency/Route/No of Doses

1.

2.

3.

Remarks:

- De-escalation on time Y/N
- Delay in de-escalation ____ days
- Category of inappropriate use
- Wrong choice/Wrong dose/Prolonged duration

2. Antimicrobials

	(To be ticked)	Start Date	Stop Date	Dose/Frequency/Route	Reason for starting antibiotic	Serum Creatinine
1.	E / P / L	<input type="text"/>	<input type="text"/>	<input type="text"/>
2.	E / P / L	<input type="text"/>	<input type="text"/>	<input type="text"/>
3.	E / P / L	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.	E / P / L	<input type="text"/>	<input type="text"/>	<input type="text"/>
5.	E / P / L	<input type="text"/>	<input type="text"/>	<input type="text"/>
6.	E / P / L	<input type="text"/>	<input type="text"/>	<input type="text"/>

3. Antifungals

1. E / P / L

2. E / P / L

4. Specimens sent for microbiological analysis

Specimen	Lab /Div. No.	Date Sent	Report with salient Comments
1.
2.
3.
4.

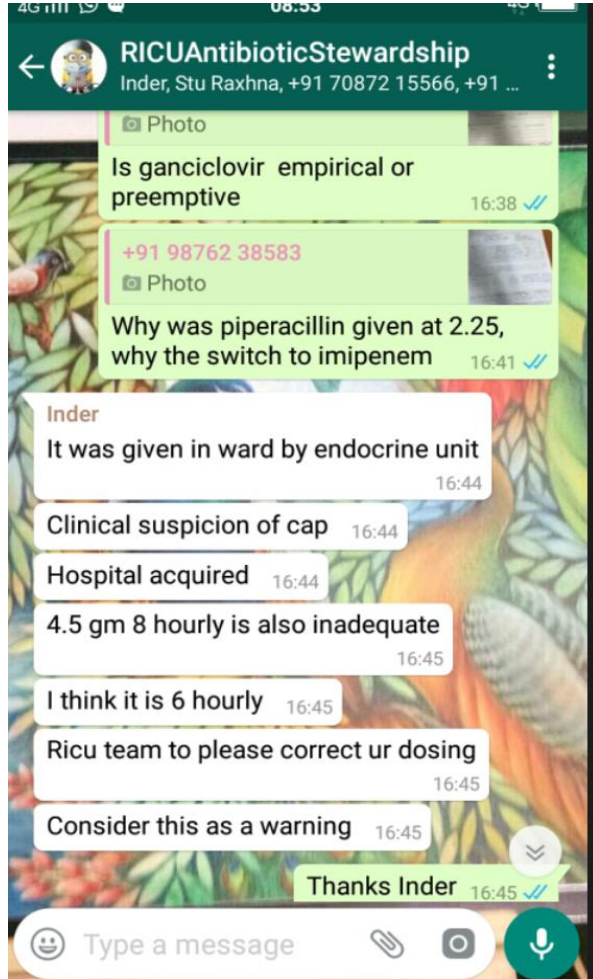
Clinical			Microbiological - Blood			Microbiological - Urine			Microbiological - Sputum		
Improved	Same Status	Death	Sterile	Additional organism	Replaced	Sterile	Additional organism	Replaced	Sterile	Additional organism	Replaced
Y/N	Y/N	Y/N	(Y/N)	(Y/N)	(Y/N)	(Y/N)	(Y/N)	(Y/N)	(Y/N)	(Y/N)	(Y/N)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Microbiological - ET aspirate			Microbiological - CSF			Microbiological - Wound site		
Sterile	Additional organism	Replaced	Sterile	Additional organism	Replaced	Sterile	Additional organism	Replaced
(Y/N)	(Y/N)	(Y/N)	(Y/N)	(Y/N)	(Y/N)	(Y/N)	(Y/N)	(Y/N)
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E-empiric, P- prophylactic, L-lab based

Version -5

3a. Audit and Feedback



	9/4	10/4	16/4	17/4	18/4	20/4
TLC	39,500	32,200	23,000	20,000	14,800	6300
Creatinine	4.4	2.79	0.8	0.7	0.7	0.9

11/4/17
 → Advice to do Blood CLS
 - Give Vancomycin empirically
 - Collect report & modify

18/4/2017: why is vancomycin continuing counts are high.
 Attempts at localization of infection
 Any cultures?

- PK-S counts are gradually going down from 40,000 to 11,000
- SHD C/S → sterile

20/4/2017: ~~This~~ Please send blood cultures. You may consider stopping vance. @

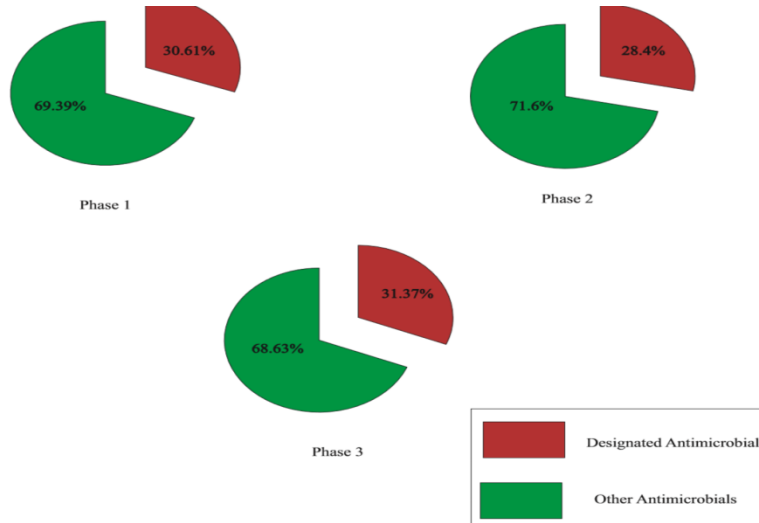
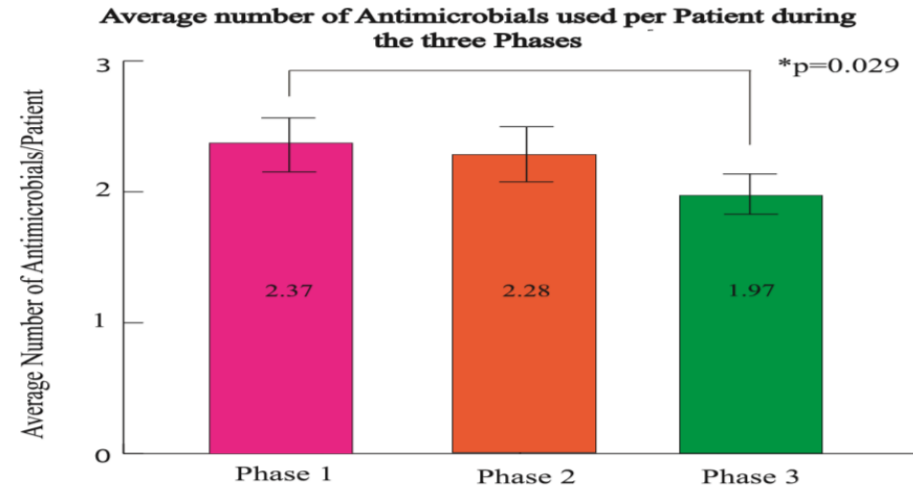
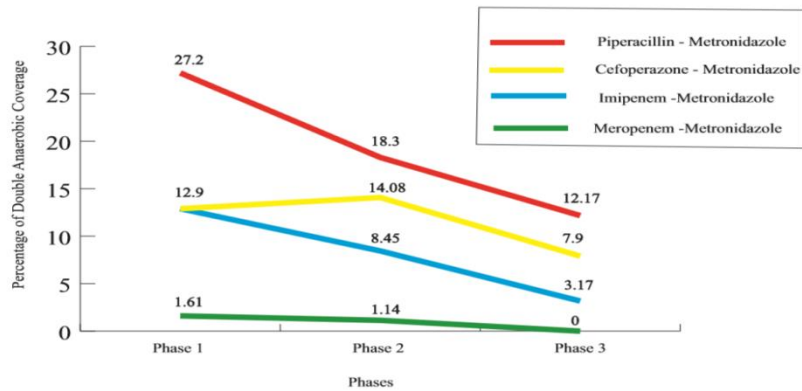
Patient is going to septic shock, so we will start collection @ and check - 11:00 22

Important Outcomes of Prospective Audits and Feedbacks

- Extensive reduction in double anaerobic cover
- Culture of sending cultures and follow up of culture reports
- Regular review of antibiotics
- Reduction in number of days on antibiotics
- Improved patient outcomes
- Initiation of combined rounds for severely ill patients

PROBLEM UNITS: I HAVE MY EYES ON YOU

Some Initial Gains- Application of Systematic Approach in a Semi-ICU setting



	Cumulative DDD/1000 Patients		
	Phase 1	Phase 2	Phase 3
Piperacillin-tazobactam	24·1	23·14	8·99
Metronidazole	25·79	26·28	18·77
Imipenem	45·19	60·45	18·96
Cefoperazone-sulbactam	73·86	53·58	22·2
Clindamycin	124	423·08	44·76
Meropenem	147·22	136·05	123·4
Vancomycin	105·58	88·34	55·99
Colistin	2000	500	97·11

Dual Strategy- Stewardship and Infection Control

- Time out reduced to 24 hours
- Daily review and remarks
- Monitoring for infection prevention strategies
- Small bites for easy digestion

Key findings

Persistence of avoidance of double anaerobic coverage

Irrational choice of antibiotics significantly reduced

Dosing issues markedly resolved

Fig 1. DOT/1000PD and LOT/1000PD in the two phases

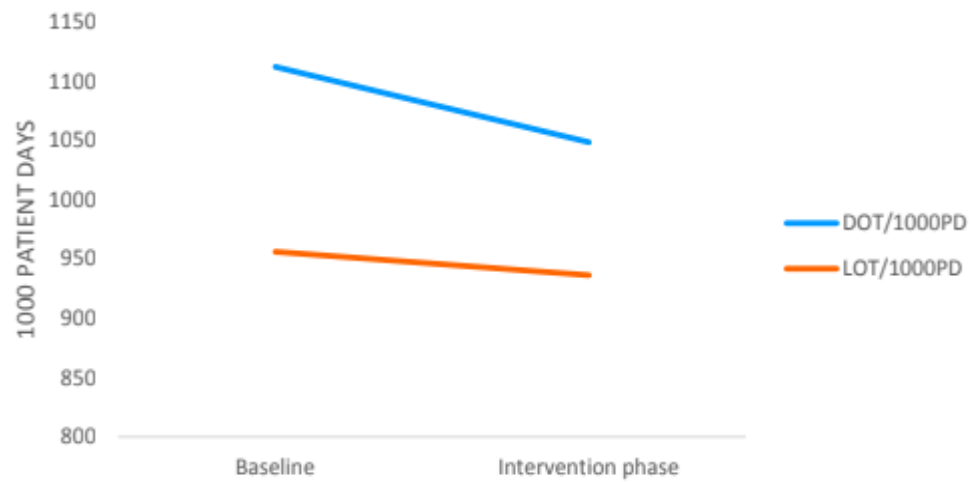
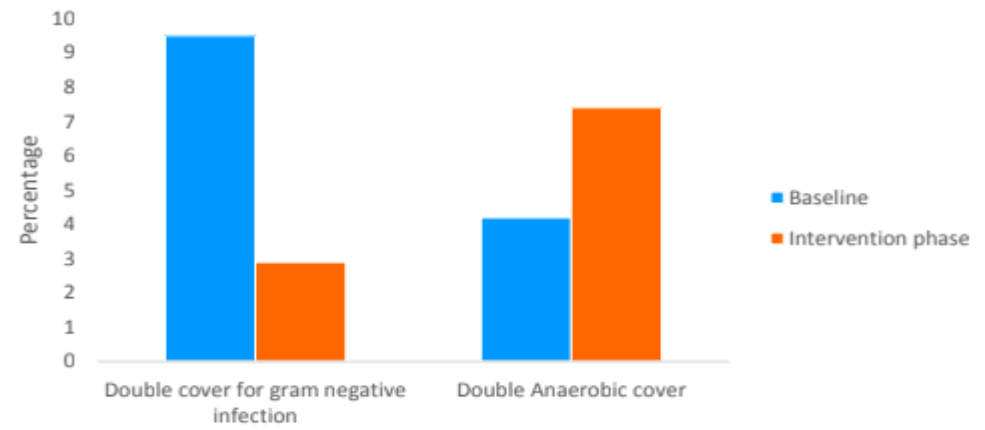


Fig 2. Double cover for Gram Negative infection and Double Anaerobic cover



160

161

3b. Team Approach for Decisions

YAHOO! INDIA

Find messages, documents, photos or people

Nusrat Home

Compose

← Back →

NNN Antibiotic ro... Page 1 of 1

To: Somosri Ray, to: ashwini rc, Neha Jain, VENKAT PGL, rajendra prasad and 17 more...

Dear all,
PFA the document for NNN antibiotic round.

With Regards,
Dr.Ashwini.R.C
DM Senior Resident
Division of Neonatology
Department of Paediatrics
PGIMER
Chandigarh
7087003424 / 9243498915

NNN Antibio...docx
17.9kB

BABIES ON ANTIBIOTICS IN NNN AS ON 16th Nov 2016

Total babies = 24

Babies on antibiotics= 2

S/o Seema dahi	21-Nov-2016	12/11/2017	Ciprofloxacin & Amikacin	Mother-developed fever 6 days before delivery on Ampicillin Loading PI for 72 hours. Baby-respiratory distress since birth(Downe-4) On Oxygen support till 6 hours of life. Blood CSF sterile CSF Culture No WBC Sugar/protein=40/247 CSF CR- Absent
S/o Maninder Kaur	24-Nov-2016	13/11/2017	Ciprofloxacin & Amikacin	Mother-Leaking PI for 2 days. Mat.TLC 23,100 Baby-Respiratory distress at birth(Downe-5). Received Oxygen for 8 hours. Blood culture Sterile CSF culture sterile CSF sugar/protein=202/221 CSF-Culture No Predominantly polymorphs.



3c.Guidelines for Management of Infections

What is available?

National Antibiotic Guidelines (NCDC, ICMR)

Indian Chest Society

Indian Academy of Pediatrics

Federation of Obstetrics and Gynecology

What is lacking?

-Alignment of existing guidelines

-Evidence Base

-Susceptibility Data

-Studies

-Dissemination

-Implementation

-Mechanism to assess impact

What is needed?

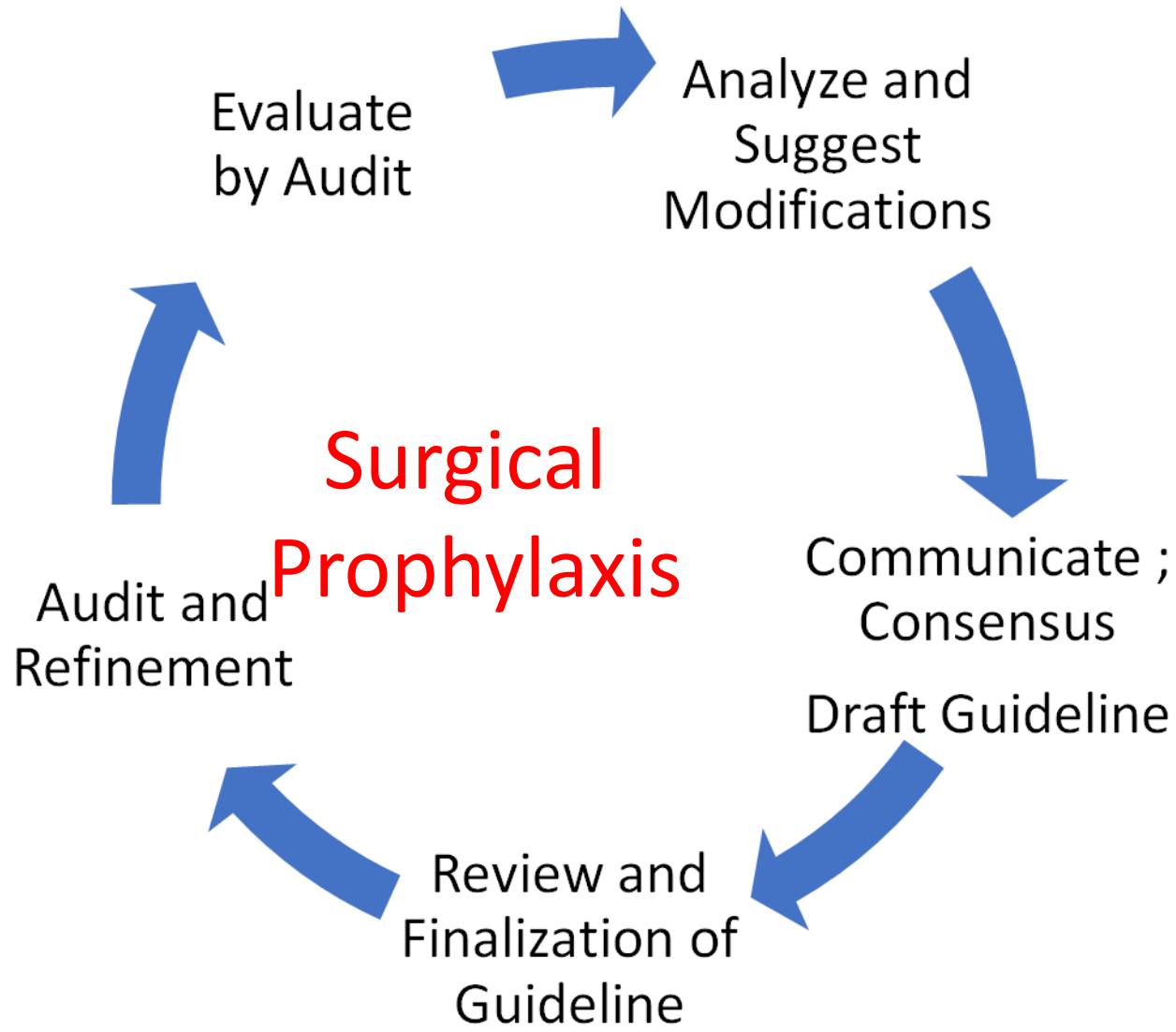
- Support for Pragmatic Trials for Various practice related questions
- Generating evidence
- Training on generation of guidelines
- Providing resources for guidelines
- Regular updates
- Training for dissemination

Antimicrobial
Policy for
Intensive Care
Units of PGIMER,
Chandigarh



Antimicrobial Stewardship Committee
PGIMER, Chandigarh

2017-18





Sharing the audit findings of prophylaxis regimen with the participants
In the CME

Departmental Representatives

3d.Training for Rational Use of Antimicrobials and its Importance

Category and cadre based trainings

Onsite, Online, Group Trainings

Hand holding for training

Training of Public

What is needed?

- Support-Technical
- Team
- Dissemination of Information



Sharing experience : CME

Bite- Size, Bed Side

Public Forum



Proposed : On-Line Training Program
Rational Use of Antimicrobials
-Tailored to practice settings
-Primary Health Centers, Stand-alone Clinics
-Free of Cost
-Mobile Based/National Portal



Team work and..... more team work

Human resource is the most important

Dedicated manpower

Different specialties bring different expertise

Expertise may lie in diverse working groups

Good to have a core team but welcome all

3e. Formulary Restriction

In patient

Outpatient

Access to Access

What is needed?

- Hospital Pharmacies with proper stocks and rates
- Application of forecasting methods for management of stocks and supplies
- Regeneration of faith in generic medicines

3 f. Antimicrobial Stewardship (AMS): Addressing Feeders

Referred patients

Previously treated patients

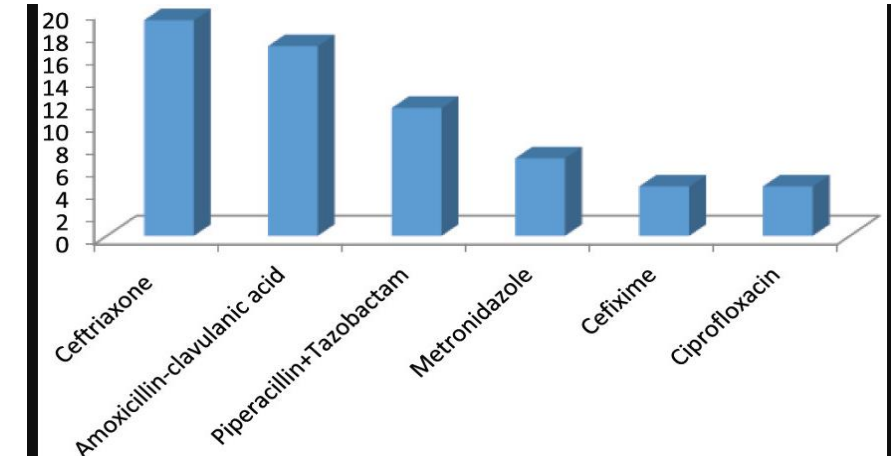
Wrongly treated patients

Emergency to ICU chain

Hospitals as incubators of infections

Table 2. Types of inappropriate use observed in prescriptions.

Type of inappropriate use	No. of patients (%)
Dose not mentioned	43 (14.3)
Frequency of administration not mentioned	300 (100)
Duration not mentioned	282 (94)
Susceptibility pattern not defined	300 (100)



Capturing Antibiotic Use Data

- Enabling systems for electronic capture of antibiotic prescriptions
 - Assess antibiotic use
 - Evaluate patterns of use
 - Identify targets for intervention
- Point prevalence survey
- Pharmacy based surveys

What is Needed ?

Resources

- Manpower, Systems, Monetary
- Legislations/Office Orders
- Involvement of Indian Medical Association
- Learning from systems established for HIV
- Implementation of Schedule H1
- Better implementation of red line

Point Prevalence Survey

5 Centers, Common protocol , Common dates, Team approach

No electronic prescriptions

Nearly 3000 occupied beds covered

Different parameters of antimicrobials evaluated

Areas for stewardship intervention identified

Setting long term and short term goals

Get the work rolling

Covering one unit and showing the results

Reducing unnecessary use- Post op prophylaxis, double anaerobic cover

Reducing DDD/1000 Patient days, DOT

Decreasing AMR

Be realistic

After 4 years- We are not yet there

Sharing

Sharing of experiences

-Locally- Positive Reinforcement/ Setting up examples

Administration- MoM

Regionally

Nationally

Internationally



Learning from others' shares

Running formal PDCA cycles

Audits on tablets

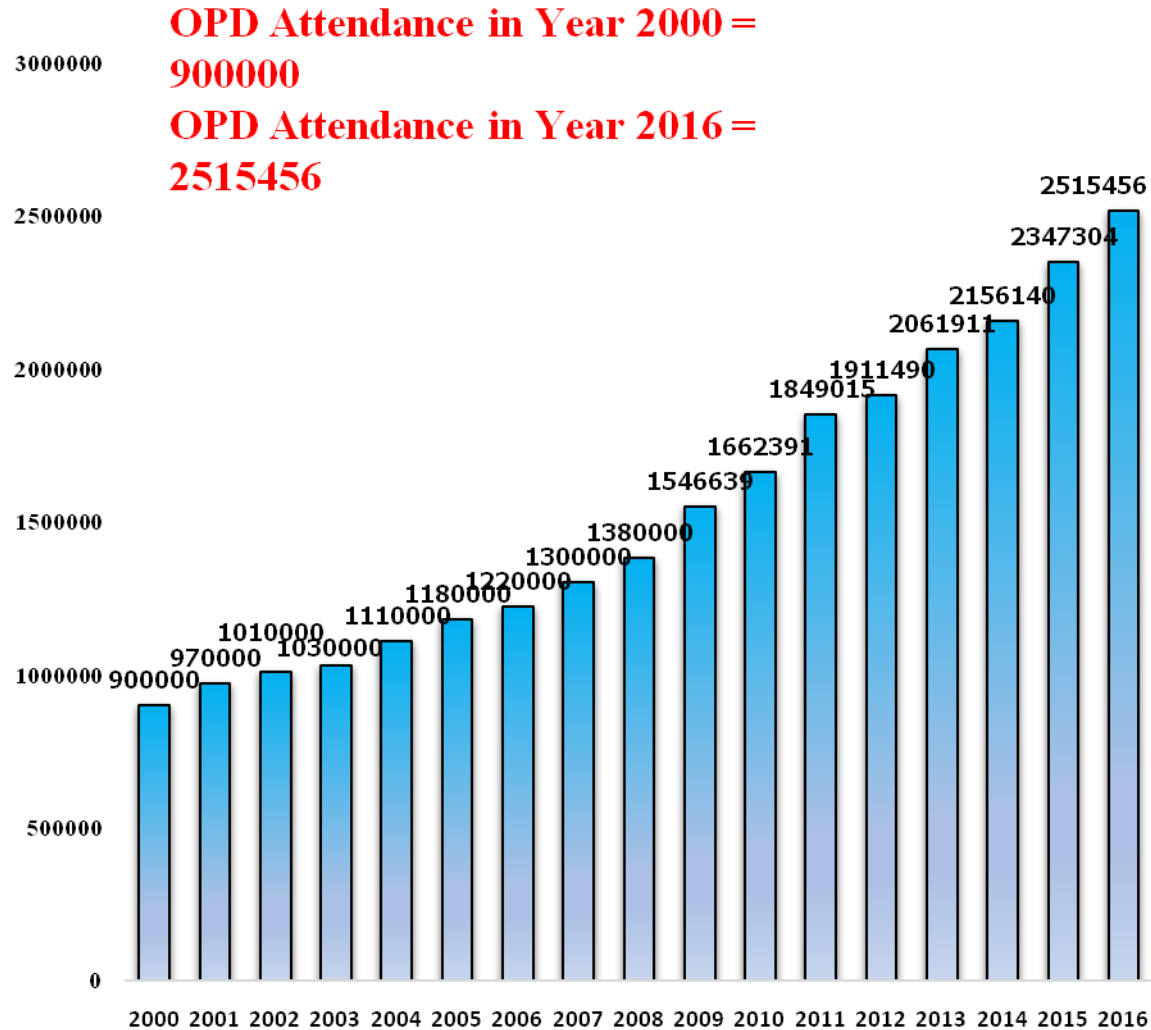
Methods of bringing in community level practitioners

Using telemedicine facility for short interactive sessions

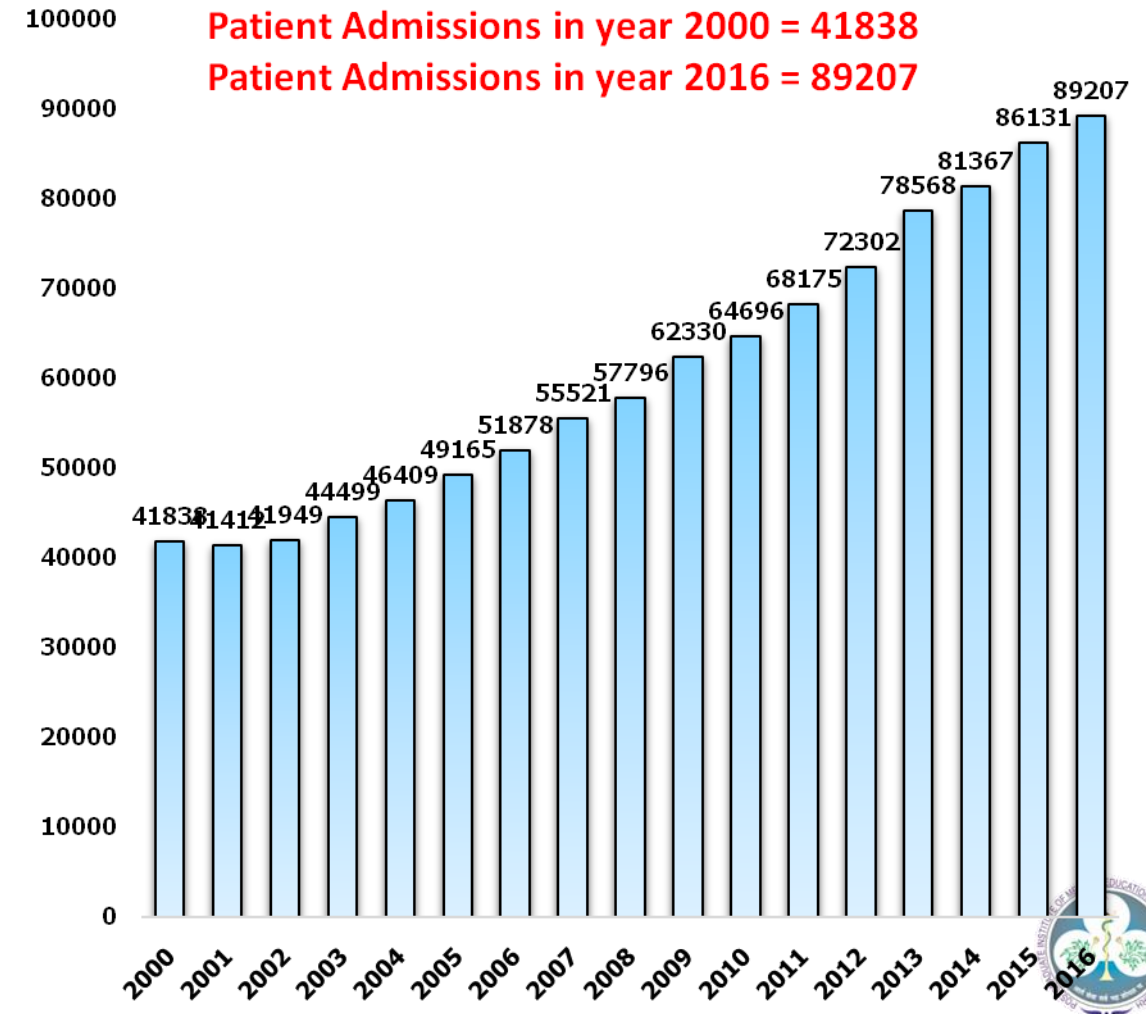
Resource sharing amongst institutes and setups

Advocacy

OUTPATIENT UTILIZATION



IN PATIENT UTILIZATION



Primary Health Center Affiliated to Community Medicine Department of a Teaching Hospital



Lalpur Sub Center , Associated with PGIMER
Photo Courtesy: Selv Kathir, PGIMER

Outpatients

Normal deliveries

No microbiology laboratory

Limited Oral Medications

Affiliated to a Teaching
Hospital

Antimicrobial Stewardship is no rocket science

1. Application of simple principles of using drugs rationally

Right drug

Right dose

Right duration

Cost

2. Analyzing patterns and identifying signals

Need to run the data in mind

Be aware of spurious signals

3. Generating evidence to fill the knowledge gaps/assess if the strategy works/Using PDCA cycles



Thank you ☺