First ABS studies in my hospital: How to do it, what to learn from it ?

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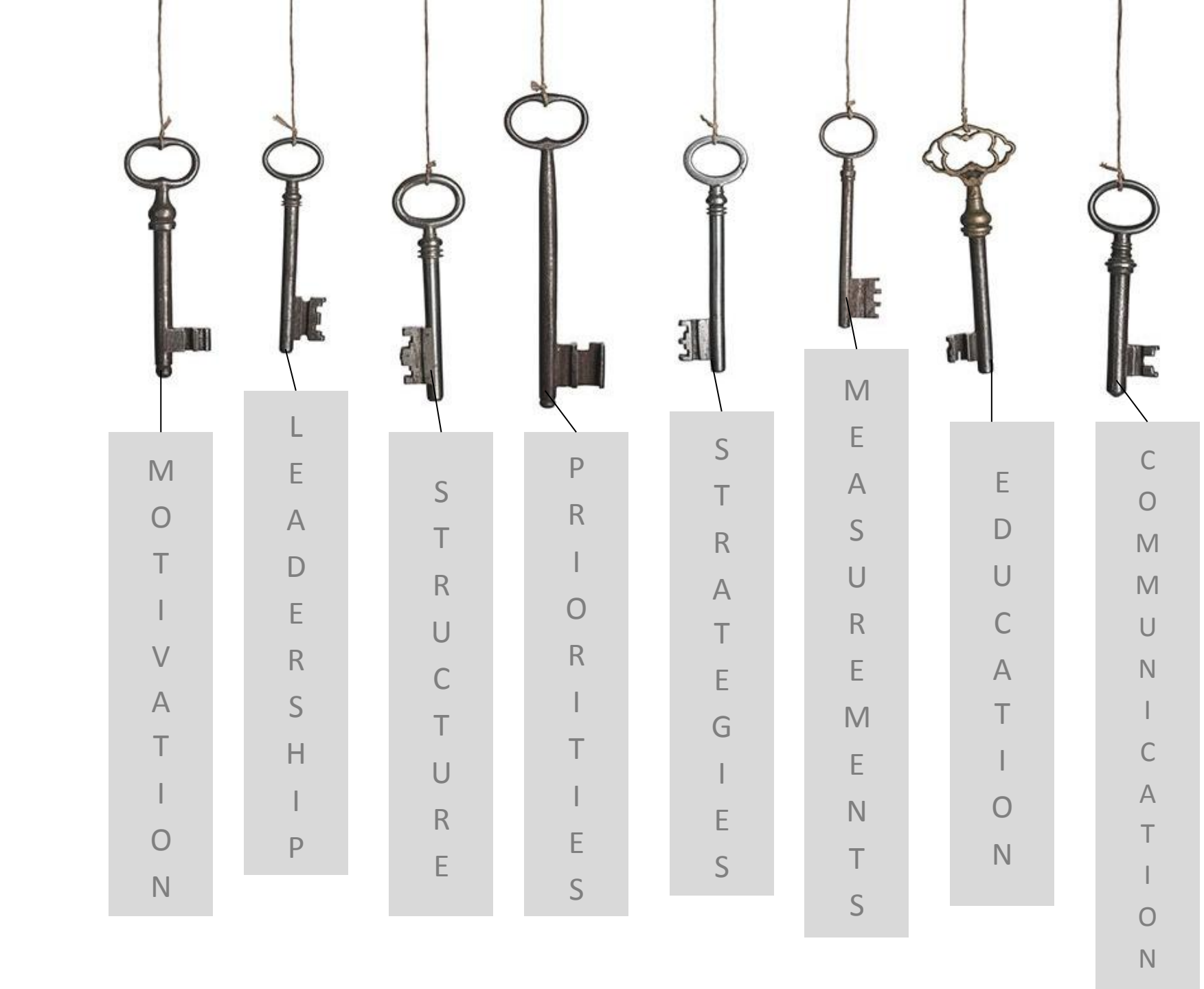
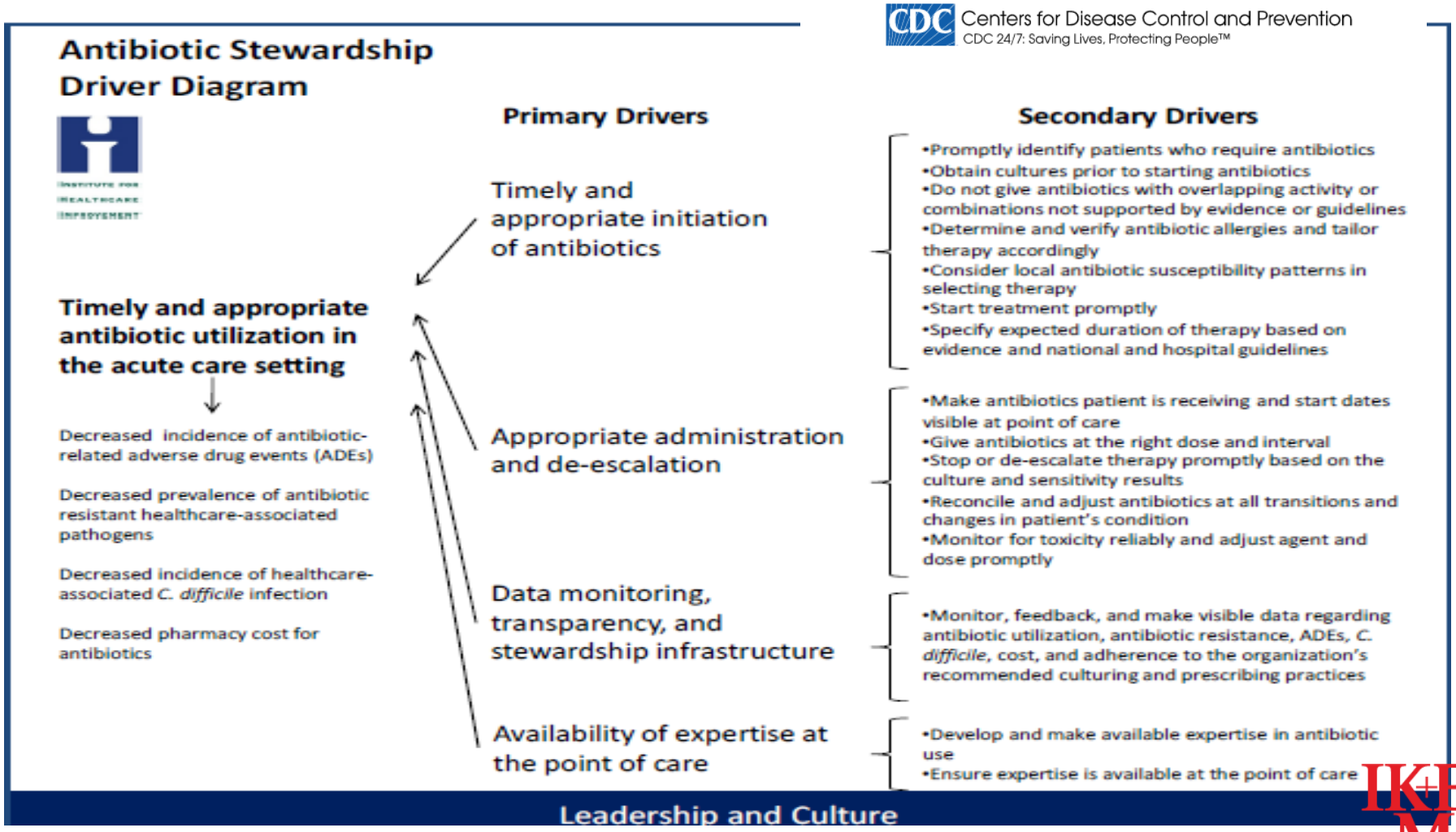
- I have nothing to declare

"The right antibiotic for the right patient, at the right time, with the right dose, the right route and the right duration causing the least harm to the patient and future patients"

www.cdc.gov/getsmart/healthcare/inpatient-stewardship


MOTIVATION
LEADERSHIP
STRUCTURE
PRIORITIES
STRATEGIES
MEASUREMENTS
EDUCATION
COMMUNICATION

Priorities and measuring progress and success



Identification of effective interventions for your setting

Identification of effective interventions for your setting

- LOCAL NEEDS
  - What can be implemented depends on local needs and issues, geography, available skills and expertise, other resources
- SUPPORT
  - It's important to select the interventions that are more supported by clinical staff
- STEP BY STEP
  - It' s not recommended that any facility attempt to implement all of the interventions at once

Identification of effective interventions for your setting

- FRONT-END strategies – preauthorization and restriction
  - Antimicrobial Prescribing Policy
  - Clinical guidelines or Care Pathways
  - Formulary restrictions/approval system – expert

Identification of effective interventions for your setting

- BACK-END strategies
  - Antimicrobial review methods
    - Review of indication for antibiotic and compliance with policy
    - Review of appropriatness of antibiotic choice, dose, route and planned duration,
    - Review of drug allergy
    - Potential for conversion from IV to oral
    - Requirement for TDM
  - Prospective audit and feedback

Identification of key measurements for improvement

- Structural indicators
- Process measures
- Outcome measures
- Balancing measures

The key is also:
Establishing what to measure, the frequency of measurement and how data will be communicated and acted upon

Starting with ABS in my hospital: Institute for Clinical and Experimental Medicine

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Institute for Clinical and Experimental Medicine

- 315 beds(111 intensive care unit beds)
- 4 specialized centres:
  - Cardiology centre
  - Transplant centre :
    - Nephrology, Hepatogastroenterology, Transplant Surgery,
  - Diabetology centre
  - Centre for experimental medicine
- 5 clinical pharmacists
  - 1 fulltime, 4 part time, covering 5 wards

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Antimicrobial Stewardship
OUR STARTING POINT

- Preauthorization and restriction
  - Electronically – microbiologist to authorise
  - Microbiologist – consulting during working hours
  - Formulary of restricted antibiotics

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Antimicrobial Stewardship Starting with Training – making experts

- 2011-2012: mandatory training in Antimicrobial Stewardship organised by Ministry of Health
  - consultant of ICU, microbiologist, clinicians, chief pharmacist, clinical pharmacist
- Weakness:
  - lack of motivation
  - resistance to change
  - lack of trust, lack of acknowledgement - clinical pharmacist –new role in the hospital

CAN WE START THE ANTIMICROBIAL STEWARDSHIP OVER AGAIN?

I WASN'T READY...

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Antimicrobial Stewardship
Leadership, Structure and Organization

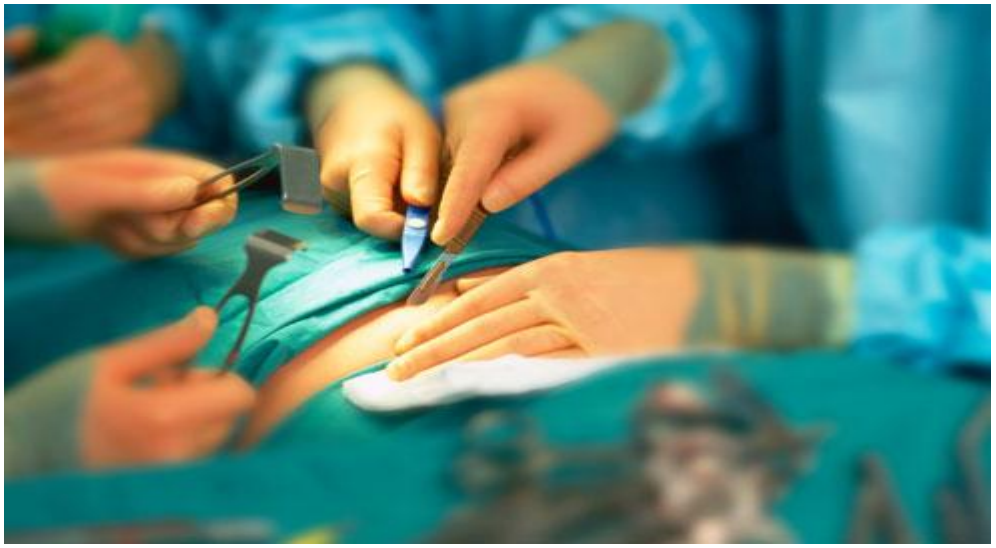
- Microbiologist, consultant of ICU, clinical pharmacist, 1 clinician per every ward
- **Team for Prevention and Control of infection**
- **Drug Committee Support**

Identification of the need

Definition of priorities
Key measurements

Antimicrobial Stewardship Prescribing Quality Assessment

Assessment of an adherence to a local and international guideline for SURGICAL ANTIMICROBIAL PROPHYLAXIS



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Assessment of an adherence to a local and international guideline for SURGICAL ANTIMICROBIAL PROPHYLAXIS (AP)

Surgical Site Infection Prevention Policies and Adherence in California Hospitals, 2010

Laurie J. Conway, RN, MS, CIC[1], **Monika Pogorzelska, PhD, MPH**[1], **Elaine L. Larson, PhD, RN, FAAN, CIC**[1,2], and **Patricia W. Stone, PhD, RN, FAAN**[1]

[1]Columbia University School of Nursing, New York, New York

[2]Columbia University Mailman School of Public Health, New York, New York

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Surgical site infections (SSIs) are common, costly, and preventable; 55% may be prevented with current evidence-based strategies.[1] SSIs occur at a rate of more than 290,000 infections per year and cost approximately $25,500 per infection, and US hospitals could therefore save more than $4 billion and prevent thousands of deaths annually by implementing SSI prevention strategies.[2] We sought to describe the presence of and adherence to SSI prevention policies in California hospitals. Specifically, we examined the adoption of

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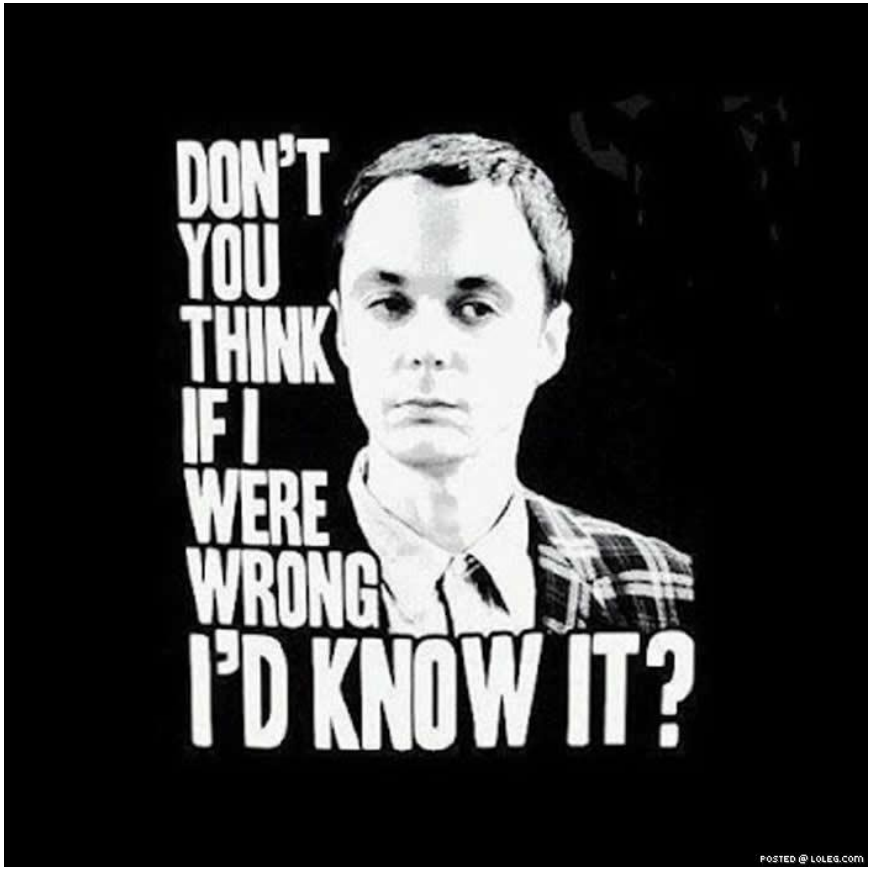
Infect Control Hosp Epidemiol. 2012 June ; 33(6): 640–641.

Why making an AUDIT?

- Key approach in changing prescriber's behaviour
  - Individual provider's performance is monitored
  - And confidentially compared/assessed
  - The feedback is likely to be accepted without controversy when is confidential
- Passive educational efforts are good to inform not to change



Audit at Transplant Surgery

- Prospective audit Dec 2014/Jan 2015
- Assessment of 50 abdominal and vascular surgeries
- Clinical pharmacist, microbiologist and clinicians
- Adherence to a local and international recommendation (BRATZLER,D.W., et al. *Clinical practice guidelines for antimicrobial prophylaxis in surgery.* Am J Health-Syst Pharm. 2013)assessed
- 8 process measures - quality assessment
- Outcome measures weren't monitored because of the complex aetiology of SSI (many contributing factors)

Process measures		Adherence to IG	Adherence to LG
Indication	AP	100 %	Not able to assess
	Therapy	69%	Not able to assess
Adequate choice of antibiotic		68%	Not able to assess
Correct dose of antibiotic		24%	Not able to assess
Preoperative timing of antibiotic		30 %	Not able to assess
Per operative (repeated) administration of antibiotic in longer surgical procedures		0%	Not able to assess
Per operative (repeated) administration of antibiotic in surgeries with blood loss ≥ 1.5l		0%	Not able to assess
Duration of AP		100 %	Not able to assess

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There was NO surgical procedure which would be 100% adherent to all process indicators

Potential barriers for adherence

- Disagreement of local and international guidelines
- Non-availability of local guidelines for every clinician
- Vague local guidelines
- Lack of education
- Lack of multidisciplinary approach (authors were anaesthesiologists only)
- Interdisciplinary disagreement (responsibility for AP, surgeon vs. anaesthesiologist), logistic problems

What Can I do with the situation?
How can I improve quality of AP prescribing?

Appropriate surgical antibiotic prophylaxis:

↓ SSI,
↓ consumption of antibiotics,
↓ prevalence of antibiotic resistant health-care associated pathogens

Primary drivers

Appropriate indication,
Duration ,
Timing,
Monitoring, Transparency,
Local available guidelines,
Expertise,
Education,

Secondary drivers

Identification of patients/surgeries who require AP,
Choice of correct antibiotic,
Correct dose (children, obese, underweight, renal/liver failure)
Options in allergy,
Correct time of administration,
Duration- when to extend prophylaxis over 24 hrs, start treatment,
Monitor feedback and make visible data regarding antibiotic utilization,
Develop expertise (microbiologist, pharmacist, clinicians),
Communicate,
Ensure expertise is available at the point of care,
Use guidelines up to date, review every 2 yrs,
Educate

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Results of the audit 2 years after the implementation

Process measures		Adherence to LG
Indication	AP	98 %
	Therapy	100 %
Adequate choice of antibiotic		98 %
Correct dose of antibiotic		83 %
Preoperative timing of antibiotic		83 %
Per operative (repeated) administration of antibiotic in longer surgical procedures		94 %
Per operative (repeated) administration of antibiotic in surgeries with blood loss ≥ 1.5l		84 %
Duration of AP		92 %

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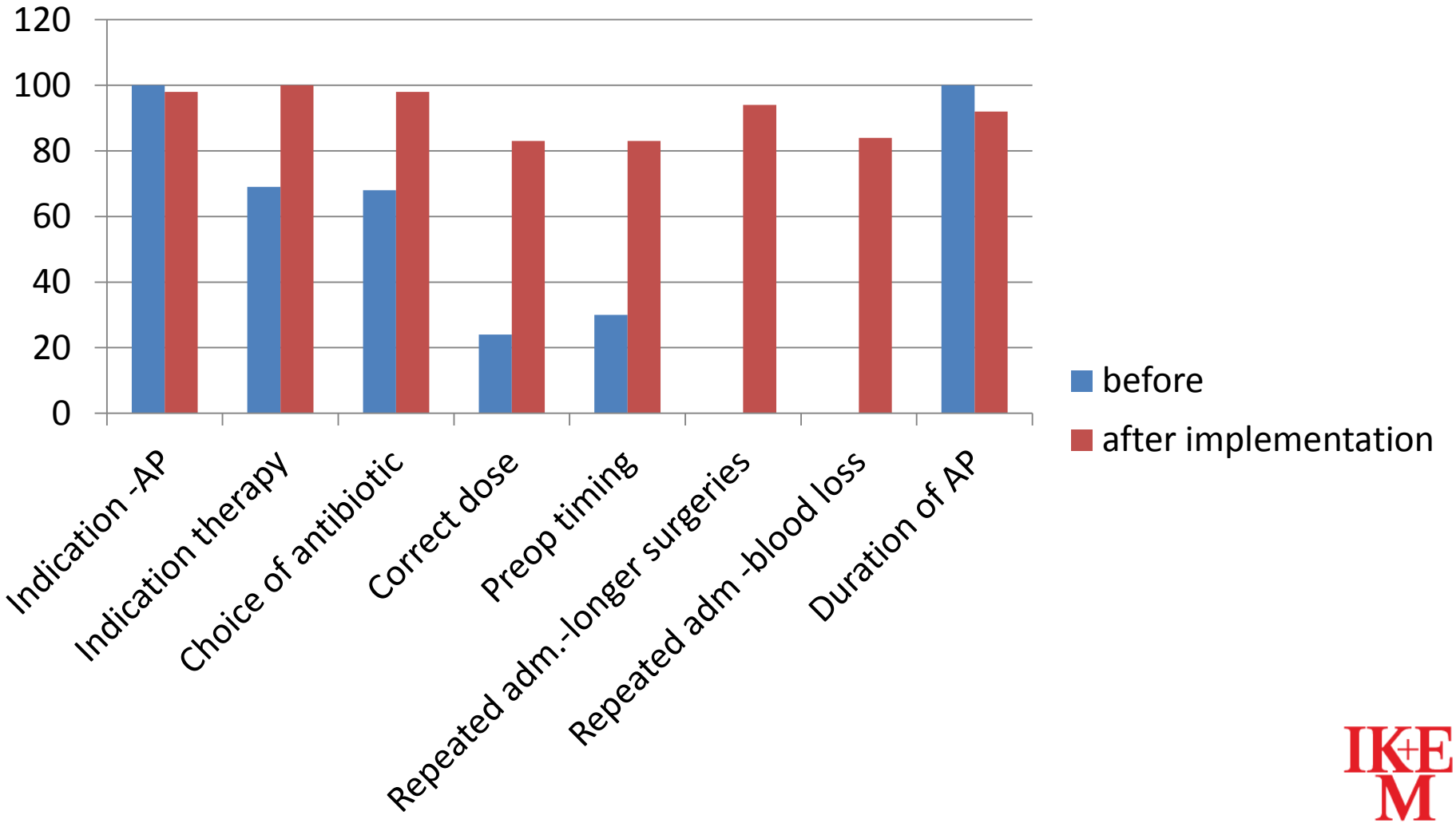
Assessment of adherence to guidelines

Before and 2 yrs after implementation



Antimicrobial Stewardship Prescribing Quality Assessment

LOCAL GUIDELINES

Local Guidelines- a starting point

- No willingness to share/display local guidelines –arguments:
  - Following “own” guidelines
  - Prescribing according to “own and best” clinical practice
  - “Guidelines are very restrictive”

A ROLE for the AUTHORITY to change the situation

Creating local guidelines

- Development of a local guideline by a local stakeholder group provides “sense of ownership”
- Identifying a need of necessary clinical guidelines
  - GAP analysis according to your local situation - urgency
  - Observation - clinical pharmacy practice, interventions, communication with clinicians, suggestions

The best indicator is when clinicians demand a guidance.

List of local guidelines

- Respecting national and international evidence based guidelines
- Stakeholders – clinicians, microbiologist, pharmacists
- Review and update every 2 years
  - **Clostridium difficile infection**
    - Observation, gaps in prescribing, infection control, lack of knowledge, lack of guidelines
  - **Splenectomy (vaccination, use of emergency antibiotics)**
    - Observation, no vaccination before/after splenectomy, no follow up, recommendation, lack of guidelines
  - **Treatment of infective endocarditis**
    - Observation - Lack of guidelines,
  - **UTI treatment outpatients/ inpatients**
    - Clinicians requirement
  - **COLOMYCIN- new old antibiotic**
    - Creating guidelines about correct dosing (until availability of new EMA recommendation) – risk of underdosing → failure of therapy

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Antimicrobial Stewardship Prescribing Quality Assessment

Therapeutic drug monitoring

TDM

"I stopped taking the medicine because I prefer the original disease to the side effects."

TDM -starting point

- Coordinated by clinicians only:
  - No previous training
  - Adjusting doses - “traffic light” system
  - Lack of knowledge about PK/PD characteristic, principle of TDM
  - Measuring concentrations as “needed”:
    - wrong use of laboratory resources

overdosing, failure of therapy, adverse events

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What can I do with the situation ?
How can I change the old practice?

Appropriate antibiotic treatment with NTI antibiotic

↑ safety,
↑therapeutic effect,
↓ cost,
↓ hospital stay,
↓ antibiotic resistance

Primary drivers

Indication,
Dosing,
Monitoring,
Local guidelines,
Expertise,
Education

Secondary drivers

Choice of a correct antibiotic,
Correct dose(renal failure, MIC, disease)
Pharmacokinetic modeling,
Improve the use of laboratory resources,
Interpret laboratory data, concentrations,
Duration of the treatment
Options in allergy,
Collaboration of microbiologist, clinicians, pharmacists,
Communicate,
Create local guidelines,
Create monitoring tool ,
Monitor feedback and make visible recommendation,
Educate

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TDM- today’ s practice

- Automatic pharmacist consultation on wards with established clinical pharmacy service
- On request- where clinical pharmacy service is not provided routinely
- Every clinical pharmacist on ward is responsible for:
  - Identification of drugs that need TDM
  - Checking the indication, duration of the antibiotics
  - Guiding about measuring and timing of measurements of concentrations
  - Communication with microbiologist, biochemist, clinician
  - Interpreting the measured concentrations and predicting dosing (using MWPHARM)
  - Giving feedback to the prescriber (electronically and orally)
  - Education of the clinical staff (nurses , clinicians)

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LABORATORNÍ PŘÍRUČKA

PRACOVIŠTĚ LABORATORNÍCH METOD

přednosta prof. MUDr. Antonín Jabor, CSc.


Všeobecné informace


Laboratorní vyšetření PLM


Kontakty


Referenční meze


Žádanky


Terapeutické monitorování léčiv


Externí laboratoře


Laboratoře IKEM mimo PLM

Verze 17, 15.08.2017

Žádanka TDM antibiotika

Základní informace k TDM

Ukázka interpretace

Terapeutické monitorování léků (TDM)

Kontakty:

Pracoviště laboratorních metod:
MUDr. Janka Franeková Ph.D., kl. 5225

Oddělení klinické farmacie a lékové informační centrum
Mgr. K. Chrapková PG Dip, kl.5274, (8243)
PharmDr. Iva Prokopová Ph.D., kl. 5274 (8244)
Mgr. Eliška Dvořáčková kl. 5274 (8244)

Antibiotika teoretické podklady

Aminoglykosidy
Vankomycin

Imunosupresiva teoretické podklady

Tacrolimus
Everolimus
Cyklosporin

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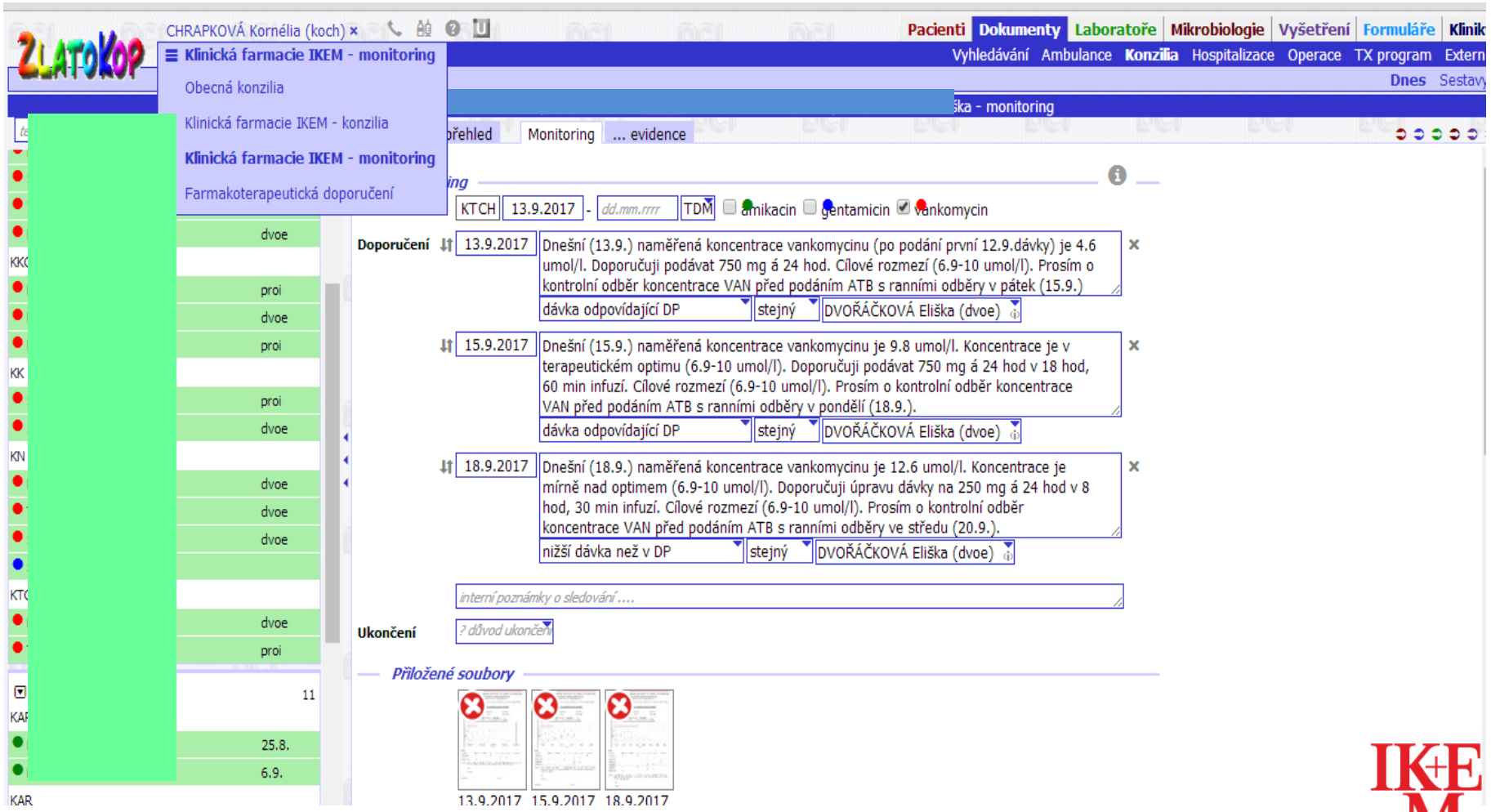
Selection of patients with NTI antibiotics in hospital



Accessible feedback/recommendation for a prescriber

VÍDEŇSKÁ 1958 / 9
140 21 PRAHA 4 - KRČ

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PRACOVIŠTĚ LABORATORNÍCH METOD
Přednosta: Prof. MUDr. Antonín Jabor CSc.

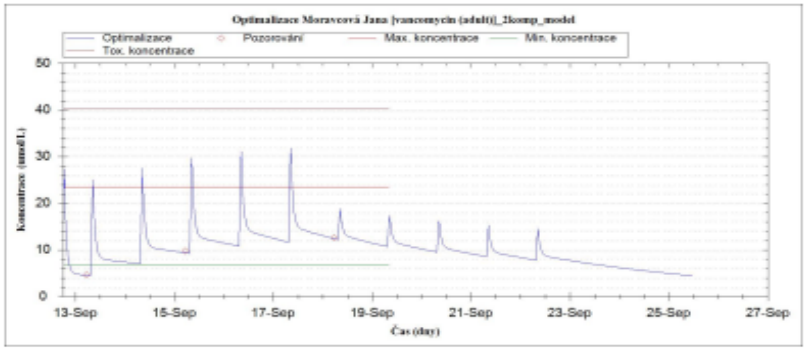
Kontakt: MUDr. Janka Franeková, Ph.D., 5225, 737 205 963, Mgr. Kornélia Chrapková, PG Dip, 5274, 8243

Interpretace terapeutického monitorování léků

vancomycin (adult)

Výška: 172 cm **Oddělení: KNJIP**

Váha: 80 kg **Ošetřující lékař:**



Historie

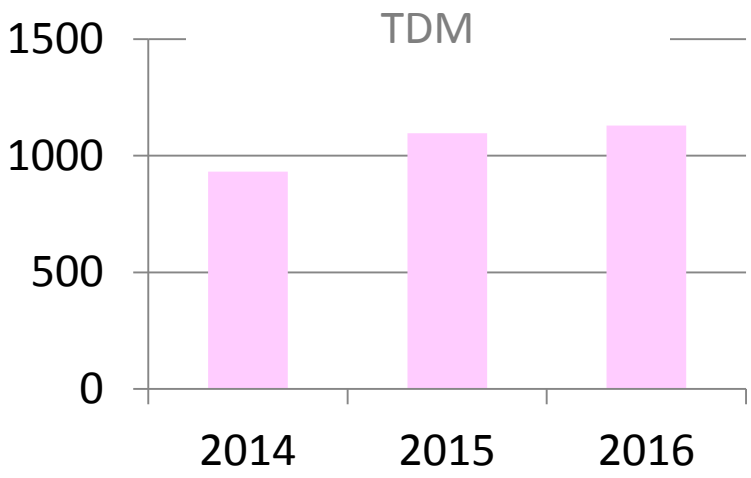
Datum & Čas	Dávka [mg]	Počet dávek	Tint [h]	Tinf [h]	Konc [mg/l]	Konc [umol/l]	S_Kreatinin [umol/l]
18/9/2017 8:00:47	250	5	24	1	0		
18/9/2017 6:00:05					18,81	12,6	
17/9/2017 7:01:39					0		187
15/9/2017 7:24:36					0		238
15/9/2017 6:00:38					14,63	9,8	
13/9/2017 8:00:23	750	5	24	1	0		
13/9/2017 5:55:07					6,87	4,6	
12/9/2017 18:00:29	1000	1		1	0		

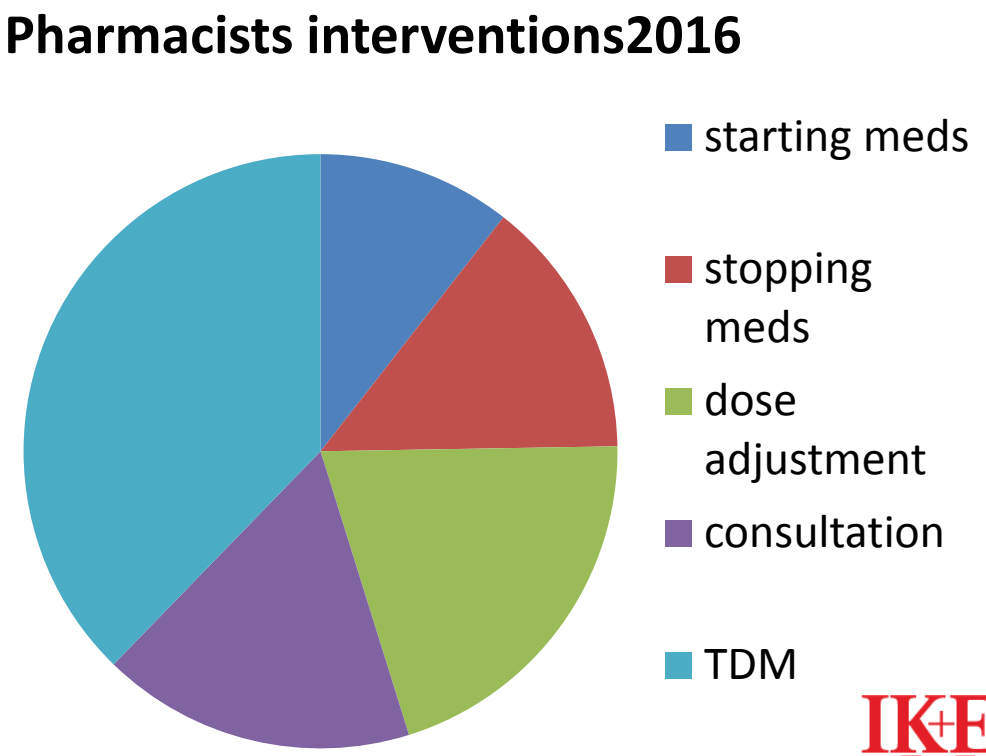
Doporučení : Dnešní (18.9.) naměřená koncentrace vankomycinu je 12.6 umol/l. Koncentrace je mírně nad optimem (6.9-10 umol/l). Doporučuji úpravu dávky na 250 mg á 24 hod v 8 hod, 30 min infuzí. Cílové rozmezí (6.9-10 umol/l). Prosím o kontrolní odběr koncentrace VAN před podáním ATB s ranními odběry ve středu (20.9.).

Děkuji

Dvořáčková E

TDM done by pharmacists





TDM provided by clinical pharmacists was also a very important key for implementing clinical pharmacy service on wards.

Take home messages

- Assemble a multi-professional antimicrobial stewardship
- Establish a clear aim that is shared by all the stakeholders
- Start with core evidence-based stewardship interventions depending on local needs
- Plan measurement to demonstrate their impact
- Try not to implement all interventions at the same time
- Educate

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Thank You!