La recherche de la qualité en maladies infectieuses

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Centre hospitalo-universitaire de Charleroi, Charleroi
The Quest for Quality in the Hospital Infectious Diseases Management
The question is:

- How to adapt the concept of quality in the field of the Infectious Diseases (ID), how to implemented it in the real life and what are the way for a good evaluation.
What means quality ?

for the patient ...

- Efficacy
- No adverse event
- Low cost

Fast, safe and « broad » antibiotherapies ?
What means quality?

for the patient ...

- Efficacy
- No adverse event
- Low cost

for the community ...

- No transmission
- No resistance
- Low cost

Fast, safe and « broad » antibiotic therapies?

Less and « narrow » antibiotic therapies?
Paterson DL and Rice LB,
Empirical antibiotics choice for the seriously ill patient: are minimization of selection of resistance organisms and maximization of individual outcome mutually exclusive?
CID 2003;36:1006-12

Bantar C et al.
A hospital intervention program to optimize the quality of antibiotic use: impact on prescribing practice, antibiotic consumption, cost savings and bacterial resistance
CID 2003;37:180-6
Warning:

The role of the Infection Control Committee will be scotomised.

Sorry ...
What is bad? What is good?

- Excessive use
- Unnecessary use
- Rationnal use
- Prudent use
Unnecessary use of antimicrobial in hospitalized patients
(Hecker, Arch Intern Med 2003;163:972-8)

- **Treatment > prophylaxis**  (27% > 14%)
- **Internal medecine > surgery/obst.**  (32%>10%)
Unnecessary use of antimicrobial in hospitalized patients
(Hecker, Arch Intern Med 2003;163:972-8)

• Treatment > prophylaxis  (27% > 14%)
• Internal medecine > surgery/obst.  (32%>10%)

• Longer than required  (33 %)
• For non infectious reasons  (32-36 %)
• For colonization or contamination  (16-12%)
• Redundant coverage  (10-9%)
• Unnecessary spectrum  (4-5%)
Unnecessary anti-anaerobic coverage

- Augmentin*
- Piperacilline-tazob.
- Moxifloxacine
- Amoxycillin, C2
- C3, C4,
- Aztreonam, Temocilline
- Levofloxacine
Where is way toward « Qualityland » ?
Guidelines

« The originator of guidelines is difficult to determine. I used to believe that it was Moses an his Ten Commandments, a set of rules that have not achieved full implementation »

Peter A. Gross CID 1998;26:1037-41
Guidelines

- Search is often unsuccessful
- Adapt needs local parameters
- Set up requires agreement
- Evaluate takes time
- Improve calls for collaborations
NEJM: 63 articles / 9 « guidelines »

Cochrane:
- 55 « topics » (malaria, parasitoses, vaccination, MRSA, shok, meningitis, tuberculosis, diarrhea, HIV)
- UTI: 5 articles

CID/IDSA: 13 topics (+HIV)
- Catheter infections
- Cystitis and pyelonephritis
- Diarrhea
- Fever in ICU, oncological patients and long termes facilities
- Fungal infections
- Hepatitis C
- Lyme
- Pneumonia, Streptococcal pharyngitis, tuberculosis
Guidelines

- Search is often unsuccessful
- Adapt needs local parameters
- Set up requires agreement
- Evaluate takes time
- Improve calls for collaborations
Natwani D et al., Do guidelines for CAP improve the Cost-effectiveness of Hospital Care?
CID 2001;32:728-41

There is good evidence that following the recommendations of the CAP guidelines does improve the cost-effectiveness of care and, therefor, that an audit of CAP may be worth the effort.
Use of indicators to evaluate the quality of CAP Management
Nathwani D et al. CID 2002;34:318-23

<table>
<thead>
<tr>
<th>Bivariate analysis of risk of death</th>
<th>Relative risk</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity</td>
<td>6.17</td>
<td>3.11-12.24</td>
</tr>
<tr>
<td>Within protocol</td>
<td>0.58</td>
<td>0.34-1.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multivariate analysis of risk of death or readmission</th>
<th>Logistic regression coefficient</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity</td>
<td>3.617</td>
<td>0.004</td>
</tr>
<tr>
<td>Within protocol</td>
<td>1.699</td>
<td>0.154</td>
</tr>
</tbody>
</table>

- Lack of awareness or familiarity
- Lack of agreement, of self efficacy, of outcome expectancy
  - Different interpretation of evidence
  - Not convinced by the risks/benefits analyses
  - Not applicable to the concerned population or to the patient
  - « cookbook »
  - Psychological reasons
  - Uncredibiliy of the authors
- External barriers
Some tools... (or weapons)

- Conferences and seminars...
- Booklets and formularies ...
- Restriction of drug
- The Web
- The ID specialist
Impact of formal Continuing Medical Education

Do Conferences, Workshops, Rounds and other traditional Continuing Education Activities change physician behavior or health care outcomes?

Davis D et al. JAMA 1999;282:867-74
Impact of formal Continuing Medical Education

... didactic sessions do not appear to be effective in changing physician performance.

...
Impact of formal Continuing Medical Education

... didactic sessions do not appear to be effective in changing physician performance.

... show some evidence that ... CME sessions that enhance participant activity and provide the opportunity to practices skills can effect change in ...practice and, on occasion, health care outcomes.
Formularies, Order forms and any kinds of restriction
• **Restrictive lists**
  – Must be accepted
  – Which kind of objective
  – Translation of prescription and focalized pressure

• **Rotation policy**
  – Usually only one rotation is published
  – Difficult to implement
• **Communication with the lab’**
  – Requires time and who does it ?
  – Not (well) investigated
  – Probably a good thing

• **Booklets**
  – UTI/URI : 51% drug, 43% posology, 10% length (Ricai 1998)
  – Towards PC-help !

• **Order forms**
  – Must be accepted
  – Change / parenteral to enteral administration
  – And the contrôle is ..
« Stop order »
A 61-year old male factory worker with a history of chronic obstructive pulmonary disease presents with fever and increase in coughing and sputum production in the past 24 hours. He appears somewhat ill and febrile, with rales in the right lower lung field.
Is the Web useful for the management of this patient?

Schmitt SK and Mehta N, Systematic reviews of infectious diseases. CID 2002;34:1515-23
<table>
<thead>
<tr>
<th>Question</th>
<th>Key words</th>
<th>www</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased risk for pneumonia</td>
<td>Pneumonia and COPD</td>
<td>⇒ Mandell</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>RX ?</strong> Hospital ? Microbiology ?</td>
<td>Pneumonia</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IDSA</td>
<td>Rx? yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATS</td>
<td>Hospital ? yes yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medline</td>
<td>Microb ? yes no</td>
<td></td>
</tr>
<tr>
<td>Antimicrobial ?</td>
<td>Pneumonia</td>
<td>IDSA</td>
<td>FQ or (Macr.+ B lactam)</td>
</tr>
<tr>
<td>Resistance ?</td>
<td><em>S. pneumoniae</em> Resistance</td>
<td>CDC</td>
<td>13 % Pen R 20 % Erythr R 3 % C3 R</td>
</tr>
</tbody>
</table>
• Empirical treatment is initiated with azithromycine (macrolide) and Ceftriaxone (β lactam) but the patient worsens clinically after receiving only single doses of these agents. A second chest radiograph shows new infiltrates.
<table>
<thead>
<tr>
<th><strong>Question</strong></th>
<th><strong>Key words</strong></th>
<th><strong>www</strong></th>
<th><strong>Answers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Any peculiar outbreak ?</td>
<td>e-mail</td>
<td>Emerging Infections Network</td>
<td>Yes : <em>Legionella</em></td>
</tr>
<tr>
<td>Which test ?</td>
<td>Legionella Diagnosis</td>
<td>Ovid medline ⇒ NEJM</td>
<td>Urinary antigen</td>
</tr>
<tr>
<td>FQ or macr for Legionellosis ?</td>
<td>Legionella + Quinolone + macrolide + …</td>
<td>Ovide medline</td>
<td>In vitro Animal models</td>
</tr>
<tr>
<td></td>
<td>Pneumonia + Quinolone + macrolide + …</td>
<td>Ovide medline</td>
<td>Some patients in prospectives trials</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clinical evidence</td>
<td>New is no better than old agents</td>
</tr>
</tbody>
</table>

*Azithromycin treatment is continued and the patient slowly recovers*
• How much « clics »?
Wouldn’t an ID’s specialist work better (and faster) for the management of such a patient?

Petrak RM et al.
The value of an infectious diseases specialist.
## A global overview

<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986-99</td>
<td>5 studies</td>
<td>Description of activities</td>
</tr>
</tbody>
</table>
| 1991   | Wilkins    | Correction of *bad* diagnosis: 7 %  
*bad* treatment: 41 % |
| 1997   | Classen    | Longer stays and higher costs !                  |
| 2001   | Yinnon     | Modification of treatment: 46 %                   |
Some positive points for the ID *sp*.

<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Disease/Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>Kitahata</td>
<td>HIV</td>
</tr>
<tr>
<td>1997</td>
<td>Elhanan</td>
<td>UTI</td>
</tr>
<tr>
<td>1998</td>
<td>Fowler</td>
<td><em>S. Aureus</em> endocarditis (mainly by recommendations)</td>
</tr>
<tr>
<td>2001</td>
<td>Lobati</td>
<td>« Bone salvage »</td>
</tr>
<tr>
<td>2001</td>
<td>Eron</td>
<td>« Early and better » discharge</td>
</tr>
</tbody>
</table>
Moving

- from bedside directive care or consultation
- to help for the collectivities.
<table>
<thead>
<tr>
<th>Advices</th>
<th>6 studies</th>
<th>Reduced morbidity, mortality and costs (including Byl, 1999, Bacteremia)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection control</td>
<td>None (?) study</td>
<td>Most ID <em>sp.</em> do it</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Only 26% are payed for</td>
</tr>
<tr>
<td>Educational tasks</td>
<td>None (?) study</td>
<td>Managing the guidelines</td>
</tr>
<tr>
<td>Antibiotic’s regulation</td>
<td>Fox 2001</td>
<td>ICU</td>
</tr>
<tr>
<td></td>
<td>White 1997</td>
<td>Prior autorisation</td>
</tr>
<tr>
<td></td>
<td>McGowan 1976</td>
<td>Monitoring of use</td>
</tr>
<tr>
<td></td>
<td>Briceland 1988</td>
<td>From bi- to monotherapy</td>
</tr>
<tr>
<td></td>
<td>Quintiliani</td>
<td>From broad to reduced spectrum</td>
</tr>
<tr>
<td></td>
<td>Ehrenkranz 1992</td>
<td>Pulmonary infections</td>
</tr>
</tbody>
</table>
Some pitfalls of these kind of studies…

- The rules are chosen by the authors
- The « infectiologist » is among the authors
- The « evaluator » is among the authors
- No randomization
- Poor definition of most criteria
Evaluating ….

• The outcomes
• The situations
• The tools
Quality control:

- Study of errors
  - Procedure to recognize errors
  - Procedure to minimize (or correct) errors
  - Involvement of each participants
  - Involvement of a supervisor inside the team
  - Needs the « working together » principle.
Quality assurance:

• A dynamic and ongoing process of monitoring system that permits corrective action when established criteria are not met.

• It includes
  – *Quality control procedures*
  – Procedure for methods selection
  – Methods evaluation
  – Preventive maintenance
  – In-service training
  – Activities management

*But the objectives remain outside the process!*
What about ISO 9000?

• Iso 9000 adress the « management of the quality » about two topics:
  – The assurance of the satisfaction of the client
  – The assurance of the respect of all regulations
The need for an integrated process.

– Precontemplation
  ➢ Awareness of multiresistant strains or immunocompromised patients
– Contemplation
  ➢ Discussion of epidemiology and antibiotics use
– Preparation
  ➢ Seminars, brainstorming, bedside discussions
– Action
  ➢ Stop orders, formularies, bedside consultations, guidelines
– Maintenance
  ➢ Evaluation, adaptation of guidelines and formularies.
Evaluation …

• Internal or external audit ?
• What is the gold standard ?

• Unsuitability of the « blinded randomised trial »
• The classical « double blind randomized study » (including a placebo ?)

• A dynamic process

The Heisenberg’s principle
VAP : CIPS $\leq 6$ *(adapted from Pugin)*

- Ciprofloxacin for 3 days
- Day 3:
  - CIPS $> 6$ : adapt and continue
  - CIPS $\leq 6$ : stop ciprofloxacin

Standard Care
(10-21 jours)
<table>
<thead>
<tr>
<th>Metric</th>
<th>Stop or continue</th>
<th>Standard care</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPIS $D_3 &gt; 6$</td>
<td>21 %</td>
<td>23 %</td>
</tr>
<tr>
<td>ATB &gt; 3 D</td>
<td>18 %</td>
<td>97 %</td>
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<td>R/Superinfections</td>
<td>14 %</td>
<td>38 %</td>
</tr>
<tr>
<td>ICU stay mean/median</td>
<td>9.4 d / 4 d</td>
<td>14.7 d / 9 d</td>
</tr>
<tr>
<td>Mortality $D_{14}/D_{30}$</td>
<td>8 % / 13 %</td>
<td>21 % / 31 %</td>
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Stop or continue / Standard care

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But … « during the trial, some patients randomized as standard care benefit (?) of the rules applied in the other arm »
An interim conclusion:

1. Define clearly your objective(s)
2. Be aware of the weakness of parameters
3. Waist no time
4. Go into a dynamic process
An interim conclusion:

1. Define clearly your objective(s)
2. Be aware of the weakness of parameters
3. Waist no time
4. Go into a dynamic process
5. One tool is ineffective; coordinated action is best
6. You are not alone
Du plaisir solitaire

... à l’activité de groupe

JC Legrand
Clinique des Maladies Infectieuses
CHU Charleroi
Janvier 2003
Strulens MJ, Multidisciplinary antimicrobial management teams: the way forward to control antimicrobial resistance in hospitals Current opinion in Infectious Diseases 2003;16:305-7
• **A microbiologist**
  – Classical « microbiological » tasks
  – Monitorisation of resistance
  – Implementation of tools for epidemiological tests
  – Counselling for the antibiotic policy committee

• **A (clinical) ID specialist**
  – Definition of appropriate use of antibiotics
  – Bedside decisions and recommendations
  – Promoting optimal use of laboratory tests
  – Education and evaluation of implementations of guidelines

• **The hospital epidemiologist**

• **A pharmacist**
• A microbiologist
• A (clinical) ID specialist
• The hospital epidemiologist
  – Control of transmission of resistance strains
  – Participation in educational programs
• A pharmacist
  – Optimal distribution of drugs
  – Monitoring of prescriptions patterns
  – Counselling in the field of pharmacokinetic
  – Regulation of orders
  – Audit of respect of guidelines

- Coordination between all actors
- Formulary-based local guidelines
- Education and regulation of prescriptions by consultant specialists
- Monitor and audit drug use
- Dissemination of information on local resistance
- and... hospital infection control
Strulens, MJ, Multidisciplinary antimicrobial management teams: the way forward to control antimicrobial resistance in hospitals Current opinion in Infectious Diseases 2003;16:305-7

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Toward the quality: more efficacity and loss toxicity

- Coordination between all actors
- Formulary-based local guidelines
- Education and regulation of prescriptions by consultant spécialists
- Monitore and audit drug use
- Dissemination of information on local resistance
- and… hospital infection control
And who will evaluate the GGA ???
(And according to which criteria ?)
... no matter who is the leader
toward a real team ...
Things change …
Acknowledgement

Daumier
Dali
Uderzo
Brel
Rochefort et Gillian
Anonymous
and...

Cervantes