ANTIMICROBIAL STEWARDSHIP

What’s In It For YOU!

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Show of Hands...

1. Have you ever taken antibiotics?

2. Whose life was saved by antibiotics?
Harsh Realities in USA

- Abx for Humans: 20%
- Abx Courses / yr: > 300 mil
- Abx for Outpatients: 50%
- Abx Appropriate: 50%
An Inconvenient Truth?
Brutal Truths

• Abx Resistance is on the rise (and it’s our fault).

• Abx discovery pipeline is all but dry.

• *We must control our destiny.*
Physicians are not happy about any of this.

“How should medical science respond?”
Key Players Must Respond!

- Public Policy Makers

Guest: Label meat and dairy from livestock treated with antibiotics

Labeling meat and dairy products produced from livestock treated with antibiotics would provide substantial benefits for all Americans, according to guest columnists David Ramonofsky and Paul Pottinger.

By David Ramonofsky and Paul Pottinger
Special to The Times

REMEMBER pink slime? It’s a so-called food additive that made news in March 2012 when reports said that it was present in over 70 percent of ground beef sold in the United States.

Though deemed safe for human consumption by the Food and Drug Administration in 2001, consumers were uncomfortable with the use of these filler materials in their ground beef. Producers of pink slime warned that its removal from ground beef would increase food prices, yet it was mostly eliminated from ground beef in the months that followed.

The pink slime controversy has passed, but the routine use of antibiotics to treat livestock is a public health threat for carnivores and vegetarians alike.

Although it failed to pass on Nov 5, state Initiative 522 to label genetically modified...
Key Players Must Respond!

- Public Policy Makers

GAIN act now law!
Key Players Must Respond!

- Public Policy Makers
Key Players Must Respond!

- Public Policy Makers
- Researchers

New Medications... and Beyond!
**The Future: Pro-Biotics?**

- *Lactobacillus crispatus* is normal vaginal flora, drives down pH, keeps *E. coli* at bay.
- Phase 2 trial of Lactin-V (Ocel) Suppositories (daily x 5, then weekly x 10)

<table>
<thead>
<tr>
<th>Outcome</th>
<th><em>L. crispatus</em> (n=48)</th>
<th>Placebo (n=48)</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTI Recurrence</td>
<td>7/48 (15%)</td>
<td>13/48 (27%)</td>
<td>RR 0.5 CI 0.2-2.1</td>
</tr>
<tr>
<td>High Level Vaginal <em>E. coli</em> colonization</td>
<td>RR 0.07</td>
<td>RR 1.1</td>
<td>P&lt;0.01</td>
</tr>
</tbody>
</table>

Stapleton CID 2011
Immunizations for Bad Bugs?

- Limitation: Normal Flora Pathogen.
- May still be feasible versus high-profile non-symbionts.
Study Limitations

✓ Animal model.
✓ Limited repertoire of Staph isolates.
✓ PNA examined, not SSTI or BSI.

Potential of MRSA Vaccine

✓ Extraordinary potential benefits…
  Unanticipated consequences?
Key Players Must Respond!

• Public Policy Makers
• Researchers
• Clinicians
Medical Students’ Perceptions and Knowledge About Antimicrobial Stewardship: How Are We Educating Our Future Prescribers?

Lilian M. Abbo,¹ Sara E. Cosgrove,² Paul S. Pottinger,³ Margaret Pereyra,⁴ Ronda Sinkowitz-Cochran,⁵ Arjun Srinivasan,⁵ David J. Webb,⁶ and Thomas M. Hooton¹

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Background. Better understanding of medical students’ perceptions, attitudes, and knowledge about antimicrobial prescribing practices could facilitate more effective education of these future prescribers.

Methods. A 24-item electronic survey on antimicrobial prescribing and education was administered to fourth-year medical students at the University of Miami, the Johns Hopkins University, and the University of Washington (January–March 2012).

Results. Three hundred seventeen of 519 (61%) students completed the survey; 92% of respondents agreed that strong knowledge of antimicrobials is important in their careers, and 90% said that they would like more education on appropriate use of antimicrobials. Mean correct knowledge score (11 items) was 51%, with statistically significant differences between study sites and sources of information used to learn about antimicrobials. Only 15% had completed a clinical infectious diseases rotation during medical school; those who had done so rated the quality of their antimicrobial education significantly higher compared to those who had not (mean, 3.93 vs 3.44, on a 5-point scale; P = .0003). There were no statistically significant associations between knowledge scores and having had an infectious diseases clinical elective. Only one-third of respondents perceived their preparedness to be adequate in some fundamental principles of antimicrobial use.

Conclusions. Differences exist between medical schools in educational resources used, perceived preparedness, and knowledge about antimicrobial use. Variability in formative education could frame behaviors and prescribing practices in future patient care. To help address the growing problem of antimicrobial resistance, efforts should be undertaken to ensure that our future doctors are well educated in the principles and practices of appropriate use of antibiotics and antimicrobial stewardship.

Clinical Infectious Diseases 2013;57(5):631–8
Abx Training at UW, JHU, Miami

4th-Year MD students surveyed several weeks before graduation…

Education Good / Very Good: 30-60%

• Basic ID case scenarios: 51% correct
• Information sources: Huge diversity (textbooks, manuals, peers, attendings, UTD, Wikipedia…)
• Heard of Abx Stewardship: 40%

WE CAN DO BETTER!
What’s in a Name?

“Antimicrobial Control”
What’s in a Name?

“Antimicrobial Control”

“Antimicrobial Management”
What’s in a Name?

“Antimicrobial Control”
“Antimicrobial Management”
“Antimicrobial Stewardship”

Steward (noun): A person whose responsibility it is to take care of something.
PLEASE BE AWARE
HUNTING SEASON IS OPEN
So is Hiking season
Don’t shoot us.
“Spiraling Empiricism”

Diagnostic Uncertainty

Rise in MDRO HAIs

Broad-Spectrum Coverage

MDRO Selection
prevent infection

diagnose and treat infection

use antimicrobials wisely

prevent transmission
12 Steps to Prevent Antimicrobial Resistance: Hospitalized Adults

1. Vaccinate
2. Get the catheters out
3. Target the pathogen
4. Access the experts
5. Practice antimicrobial control
6. Use local data
7. Treat infection, not contamination
8. Treat infection, not colonization
9. Know how to say no to vanco
10. Stop treatment when cured
11. Isolate the pathogen
12. Break the chain

Prevent Xmission

Use Abx Wisely

Dx & Rx Effectively

Prevent Infections
Newer, Fancier, Pricier ≠ Better!

Linezolid  TMP/SMX
For MRSA SSTI....
Pottinger’s Axiom: Time + Tube = Trouble
Prevent Infection

“Clean Your *&^%@! Hands”

- Hand Hygiene Remains Cornerstone of IC
- Biggest Cost:Benefit Ratio Around
- Patients Will Thank (or Chastise) You!
- Obey Precaution Placards

Ignac Semmelweis (1818-65)
Neutropenic Fever (Oncology Patients) - UWMC

Only for Hematology-Oncology patients, not stem-cell transplant patients at UWMC

**Diagnosis:** When possible, send blood culture X 2 (1 peripheral and 1 central) before antibiotics are infused. But do NOT delay antibiotics while waiting for cultures to be drawn. Review past microbiology for known colonization or infections with resistant organisms.

A. Stable with NO sepsis, NO history of resistant organisms, NO specific abdominal findings: (susceptible gram-negative rods including *Pseudomonas, Acinetobacter, E.coli, Klebsiella*, etc)

- Ceftazidime* 2gm IV q8 hours
- Consider Vancomycin* IF suspected line infection, sepsis, h/o colonization or infection with MRSA

B. Stable with h/o MDR infection or colonization, or abdominal findings: (susceptible gram-negative rods including *Pseudomonas, Acinetobacter, E.coli, Klebsiella, and anaerobes*)

- Meropenem* 1g IV q8 hours
- Consider Vancomycin* IF suspected line infection, sepsis, h/o colonization or infection with MRSA
- Consider Daptomycin* instead of Vancomycin IF history of VRE colonization or infection but DC when culture negative for VRE.

C. Sepsis without focal findings: (susceptible gram-negative rods including *Pseudomonas, Acinetobacter, E.coli, Klebsiella, and anaerobes*)

- Meropenem* 1gm IV q8 hours STAT PLUS
- Tobramycin* 5 mg/kg IV x1 STAT, based total body weight, unless obese or renal dysfunction (call pharmacy) PLUS
- Vancomycin* loading dose IV x1 (2 gm if >70 kg, 1.5 gm if <70 kg) STAHN, then 15 mg/kg IV q12 hours

*Dose adjustment may be required for renal insufficiency. Please consult Pharmacy.

**UTI**
- UTI commonly present in patients with neutropenia, neutropenic fever
- UTI source: Blood stream, blood cultures positive
- IVIG line-infection meningitis neutropenic fever PE pneumonia pulmonary embolism pyelonephritis

**Additional Information**
- Blank cells = insufficient data or drug was not tested; H = HMC; U = UWMC
- * Citrobacter freundii, Enterobacter spp., Hafnia alvei, Morganella
- * Colonization was tested at UWMC with 42% of CF S. maltophilia isolates
- * Susceptible to azithromycin, 100% susceptible to moxifloxacin

**References**
- Do not substitute this reference to OCMAC. Access OCMAC on your mobile device.

Scan the code using your barcode reader.
Key Players Must Respond!

- Public Policy Makers
- Researchers
- Clinicians
- Patients
If you’re not angry—or alarmed—you have not been paying attention.

“What can I DO?”
I WANT YOU…
To help bring antibiotic use under control!
Become an antibiotic steward!
Take Care of Each Other!
Cold or Flu. Antibiotics Don’t Work for You.

WARNING: Antibiotics don’t work for viruses like colds and the flu. Using them for viruses will NOT make you feel better or get back to work faster.

Antibiotics are strong medicines. Keep them that way. Prevent antibiotic resistance. Antibiotics don’t fight viruses—they fight bacteria. Using antibiotics for viruses can put you at risk of getting a bacterial infection that is resistant to antibiotic treatment. Talk to your healthcare provider about antibiotics, visit www.cdc.gov/getsma, or call 1-800-CDC-INFO to learn more.

Taking antibiotics for viral infections such as a cold, a cough, or the flu will NOT:
- Cure the infection
- Keep other people from catching it
- Help you feel better
Take Care
Abx Stewardship: Conclusions

“Our Brains vs. Their Genes”

• Few new abx coming…
• Abx resistance is our fault…
• Fixing this is our responsibility…
• Respect needs & patterns globally
• Together, we can do it!

THANK YOU