



## **Antibiotics in the trenches: An ER Doc's Perspective**

**Peter Currie, MD  
Medical Director for Quality  
Emergency Physicians Professional  
Association (EPPA)**

Through the pursuit of excellence, EPPA will be the premier provider of acute care medicine in the markets we serve.

### **Agenda**

- **Emergency Medicine**
- **Specific Disease Processes**
- **Next Steps**



## Happy May Day!

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- **Ancient pagan celebration of spring**
- **Haymarket Affair May 4, 1886**
- **International Workers' Day 1889**
- **Labor Day in US 1894**



<https://hobt.org/mayday/>



<http://www.newenglandhistoricalsociety.com/maypole-infratated-puritans/>



<https://www.britannica.com/topic/May-Day-international-observance>

## The problem

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- **154 million prescriptions for antibiotics each year per CDC**
- **30-50% of outpatient antibiotic prescriptions are inappropriate or unnecessary**
- **39% in one ED**

InteliData Ther 2017 Dec 6(4):497-505. doi: 10.1007/s40121-017-0175-9. Epub 2017 Oct 19.

**Assessments of Opportunities to Improve Antibiotic Prescribing in an Emergency Department: A Period Prevalence Survey.**

Timbrook TT<sup>1,2</sup>, Caffrey AB<sup>1,2,3</sup>, Quake A<sup>1</sup>, Spearoux M<sup>1,2</sup>, Curioso M<sup>1</sup>, Gattamio M<sup>1</sup>, LaRenne EJ<sup>4,5</sup>.



## Emergency Department: The Opportunity

- **CDC 2014:**
  - 141 million ED visits
  - Reason for visit:
    - #1 Abdominal pain
    - #2 Chest pain
    - #3 Cough
    - #4 Fever (but #1 for <age 15)
  - Diagnosis
    - #2 URI @ 5.5 million visits
    - #6 Cellulitis & abscess @ 3.6 million
    - #9 URI @ 2.8 million
    - #13 Fever @ 2.3 million



[www.cdc.gov/nchs/fastats/emergency-department](http://www.cdc.gov/nchs/fastats/emergency-department)

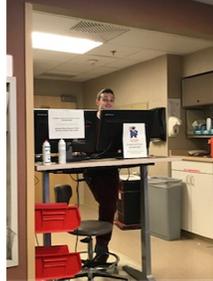
## What makes Emergency Medicine Unique?

- **EM mentality/presumption of acuity**
- **Lack of relationship**
- **Lack of continuity**
- **Lack of information**
- **Regulatory and alert/initiative fatigue**
- **Reimbursement**
- **Patient preferences/education/satisfaction**
- **Time**
- **Communication**
- **Follow-up**
- **Liability**



## For worse and better

- **Worse**
- **Better**
  - Awareness & attention
  - EMR
  - Support



J. J. S. et al. 2017 Nov 9;17(1):200-203. doi: 10.1016/j.jep.2017.07.005. Epub 2017 Jul 6.  
 Impact of an antimicrobial stewardship programme to optimize antimicrobial use for outpatients at an emergency department.

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## Pharmacist Stewardship Activities

- **Consultation in real time**
  - Selection: navigate resistance and allergies
  - Optimize dose, duration
- **Patient education**
- **Culture review**
- **Order sets and clinical decision support**
- **Provider education**
- **Antibiograms**

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## The Value of the Pharmacist

[Am J Emerg Med](#), 2014 Oct;32(10):1270-4. doi: 10.1016/j.ajem.2014.07.033. Epub 2014 Aug 2.

**Pharmacist addition to the post-ED visit review of discharge antimicrobial regimens.**

Miller K<sup>1</sup>, McGraw MA<sup>1</sup>, Tomsey A<sup>2</sup>, Hegde GG<sup>3</sup>, Shang J<sup>3</sup>, O'Neill JM<sup>2</sup>, Venkat A<sup>4</sup>.

[Am J Health Syst Pharm](#), 2011 May 15;68(10):916-9. doi: 10.2146/ajhp090552.

**Effect of a pharmacist-managed culture review process on antimicrobial therapy in an emergency department.**



## EPPA's Stewardship Activities

- Guidelines



- Data

- Physician/provider behavior change



## Behavior Change

JAMA. 2016 Feb 9;315(6):562-70. doi: 10.1001/jama.2016.0275.

### Effect of Behavioral Interventions on Inappropriate Antibiotic Prescribing Among Primary Care Practices: A Randomized Clinical Trial.

Meeker D<sup>1</sup>, Linder JA<sup>2</sup>, Fox CR<sup>3</sup>, Friedberg MW<sup>4</sup>, Persell SD<sup>5</sup>, Goldstein NU<sup>3</sup>, Knight TK<sup>6</sup>, Hay JW<sup>6</sup>, Doctor JN<sup>6</sup>.



## Disease Specific Topics



## Urine

- **Urinary Tract Infection**
  - The curse of the urine sample
  - Blood can be taken, urine comes when nature calls



- **Catheter associated urinary tract infection (CAUTI)**
  - The catheter dilemma

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## CAUTI Prevention

- **Case**
  - 78 yo F with poor mobility being treated for routine CHF exacerbation
  - RN asks to insert catheter
- **Case**
  - 78 yo F with fall, hip pain, femoral neck fracture
  - RN asks to insert catheter

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## CAUTI Prevention



- **Catheter Insertion**
  - Acute urinary retention
  - Critical care
  - Immobilization/Trauma/fracture\*\*\*
  - Surgery
  - Palliative care/End of life
  - Incontinence with sacral/perineal wounds
  - Neurogenic bladder



## CAUTI Prevention



- **Estimated as many as 50% of insertions are unwarranted**
- **2015 at Southdale Hospital ED**
- **Intervention was clinician and nursing education**
- **Catheter reduction of 41%**



## CAUTI Treatment

- Positive test



- Relevant symptoms

Diagnosis, Prevention, and Treatment of  
Catheter-Associated Urinary Tract Infection in  
Adults: 2009 International Clinical Practice  
Guidelines from the Infectious Diseases Society  
of America



## UTI Diagnosis

- Case
  - 78 yo F with fall
  - No urinary symptoms
  - She has to urinate, RN sends urine
  - UA 10-25 WBCs, small LE
  - What to do?



## Asymptomatic Bacteruria

Population	Prevalence, %	Reference
Healthy, premenopausal women	1.0–5.0	[31]
Pregnant women	1.9–9.5	[31]
Postmenopausal women aged 50–70 years	2.8–8.6	[31]
Diabetic patients		
Women	9.0–27	[32]
Men	0.7–11	[32]
Elderly persons in the community <sup>a</sup>		
Women	10.8–16	[31]
Men	3.6–19	[31]
Elderly persons in a long-term care facility		
Women	25–50	[27]
Men	15–40	[27]
Patients with spinal cord injuries		
Intermittent catheter use	23–89	[33]
Sphincterotomy and condom catheter in place	57	[34]
Patients undergoing hemodialysis	28	[28]
Patients with indwelling catheter use		
Short-term	9–23	[35]
Long-term	100	[22]

<sup>a</sup> Age, ≥70 years.



Infectious Diseases Society of America  
Guidelines for the Diagnosis and Treatment of  
Asymptomatic Bacteriuria in Adults

## Asymptomatic bacteriuria

- **Who to treat?**
  - Pregnant
  - Urologic procedures
  - Renal transplant?
- **Who not to treat?**
  - Everybody else



Infectious Diseases Society of America  
Guidelines for the Diagnosis and Treatment of  
Asymptomatic Bacteriuria in Adults

## UTI Treatment

- **Case**
  - 28 yo F with dysuria
  - UA shows large nitrite and 25-50 WBCs
- **Treatment?**

**Uncomplicated Cystitis**  
 Generally healthy, nonpregnant adult women  
**1<sup>st</sup> line** – nitrofurantoin 100mg PO bid x 5d (age <65yo, CrCl>60)  
**Fosfomycin** 3g PO once (\$\$, confirm availability)  
**2<sup>nd</sup> line** – cephalexin 500mg PO bid x 7 d  
**3<sup>rd</sup> line** – Bactrim 1 tab DS (160/800mg) PO bid x 3d, OR  
 ciprofloxacin 250mg PO bid x 3d



Guidelines for Antimicrobial Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women

## Fairview Antibiogram for *E.coli*

Amikacin	100% (5834)
Ampicillin	58% (6735)
Ampicillin/ Subactam	63% (5993)
Aztreonam	NT
Cefazolin	91% (6708)
Cefepime	99% (6716)
Cefotaxime	NT
Cefoxitin	91% (5889)
Ceftazidime	99% (6729)
Ceftriaxone	98% (6730)
Ciprofloxacin	82% (6732)
Gentamicin	93% (6736)
Imipenem	NT
Levofloxacin	82% (6728)
Meropenem	99% (5844)
Piperacillin	NT
Piperacillin/ Tazobactam	96% (6723)
Tobramycin	94% (6734)
Trimeth/Sulfa	77% (6733)
Nitrofurantoin	97%



## UTI Treatment

- **Case**
  - Same as above but with flank pain, fever, vomiting
- **Case**
  - 64 yo M with dysuria, lower abdominal pain

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## Stool

- ***Clostridium difficile***
  - Prevention
    - Hygiene and isolation
    - Overall prescribing
    - Fluoroquinolone prescribing

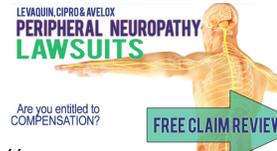


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## Fluoroquinolones

Clin Infect Dis. 2005 Nov 1;41(9):1254-60. Epub 2005 Sep 20.

**Emergence of fluoroquinolones as the predominant risk factor for Clostridium difficile-associated diarrhea: a cohort study during an epidemic in Quebec.**



<http://www.consumerjusticefoundation.com/risk-sudden-death-cipro/cipro/>

FDA Drug Safety Communication: FDA updates warnings for oral and injectable fluoroquinolone antibiotics due to disabling side effects

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## Phlegm

- **Bronchitis**
  - No or controversial modification of symptom severity and duration
  - Increased adverse effects
- **EPPA?**
- **EPPA sinusitis?**



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[http://www.cochrane.org/CD000245/ARI\\_antibiotic-treatment-people-acute-bronchitis](http://www.cochrane.org/CD000245/ARI_antibiotic-treatment-people-acute-bronchitis)

## Phlegm

- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4914667/pdf/zac4106.pdf>



## Pus

- **Abscess**
  - Abx not recommended, probably

N Engl J Med. 2017 Jun 29;376(26):2545-2555. doi: 10.1056/NEJMoa1607033.

**A Placebo-Controlled Trial of Antibiotics for Smaller Skin Abscesses.**

Daum RS<sup>1</sup>, Miller LG<sup>1</sup>, Immergluck L<sup>1</sup>, Fritz S<sup>1</sup>, Creech CB<sup>1</sup>, Young D<sup>1</sup>, Kumar N<sup>1</sup>, Downing M<sup>1</sup>, Pettibone S<sup>1</sup>, Hoagland R<sup>1</sup>, Eells SJ<sup>1</sup>, Boyle MG<sup>1</sup>, Parker TC<sup>1</sup>, Chambers HF<sup>1</sup>; DMID\_07-0051 Team.

- Treatment is I&D



Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society

## Sepsis: A different stewardship

- **Evolution**
  - 1990's early definitions of sepsis, SIRS
  - 2000's Surviving Sepsis Campaign
  - Present CMS Sep-1 Quality Measure
  
- **Early, aggressive, broad-spectrum antibiotic**



West J Emerg Med. 2017 Aug;18(5):951-956.  
doi: 10.5811/westjem.2017.4.32795. Epub 2017  
Jul 10.

## What's Next?

- **Data**
  
- **Enhanced Diagnostics**
  
- **Education**

