ECHO-Antibiotic Stewardship Program

Interesting Recent Literature Updates

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Cochrane Review Update 2/9/2017 - Meta-analysis of “interventions to improve antibiotic prescribing practices for hospital inpatients”

- Looked at persuasive (education, computer reminders) vs. restrictive (restricted formulary, automatic stop, etc) interventions to reduce excessive antibiotic prescribing - both equally effective in reduced prescribing after 6 months

- **Persuasive intervention lead to better acceptance and enhanced sustainability**

- Average study result showed 15% increase in compliance, approx. 2 day decrease in antibiotic duration and 1 day shorter hospital stay, no compromise in patient safety
“Diagnostic errors that lead to inappropriate antimicrobial use”
Gregory Filice, MD. et al
Infection Control and Hospital Epidemiology 8/2015/36/pg. 950.

• Reviewed diagnosis and antibiotic therapy use. Diagnostic accuracy is critical for optimal inpatient anti-microbial use
• If the diagnosis was correct, 62% of the time antibiotic use was indicated
• If the diagnosis was incorrect, only 5% of the time was indicated
• Abscess, intra-abd infection, CAP etc were correct dx’s and could benefit from ASP guidance
• But treating signs like pyuria, fever, leukocytosis, infiltrate instead of a specific syndrome or disease will not benefit from ASP
Health care workers refusing the influenza Vaccine
Health Care workers- approx. one third don’t take the flu vaccine

Figure 8. Main reason reported for not receiving flu vaccination among health care personnel who do not plan to get vaccinated during the 2013-14 flu season (n = 277), Internet panel survey, United States, early November 2013
Characteristics of patients with hospital-acquired influenza A (H1N1)pdm09 virus admitted to the intensive care unit


Journal of Hospital Infection
Volume 95, Issue 2, Pages 200-206 (February 2017)
DOI: 10.1016/j.jhin.2016.12.017
Figure 1

Patients with influenza A admitted to the ICU
\[ N = 2421 \]

Excluded patients (\[ N = 40 \])
(lack of date of influenza A diagnosis)

Excluded patients (\[ N = 346 \])
(lack of date of treatment initiation)

Evaluable patients
\[ N = 2035 \]

Unclassified
\[ N = 708 \]

Community-acquired influenza A
Diagnosis \[ \leq 48 \] hours
\[ N = 1103 \]

Hospital-acquired influenza A
Diagnosis \[ \geq 7 \] days
Starting treatment \[ \geq 7 \] days
\[ N = 224 \]
Time of diagnosis

- 48 HOURS
- >7 DAYS
- 48 HOURS-censored
- >7 DAYS-censored

Cumulative survival

$P = 0.001$

ICU length of stay

0 20 40 60 80
Update on *C. difficle* Infection (CDI)—are we over-isolating and over-treating our patients?
Transmissibility of Clostridium difficile Without Contact Isolation: Results From a Prospective Observational Study With 451 Patients
Andreas F. Widmer Reno Frei Stefan Erb Anne Stranden Ed J. Kuijper
Cornelis W. Knetsch Sarah Tschudin-Sutter
Clin Infect Dis (2017) 64 (4): 393-400. DOI: https://doi.org/10.1093/cid/ciw758
Published: 15 November 2016 Article history
Study from University Hospital – Basel, Switzerland

- United States: contact precautions for all patients with C. diff infection (CDI)
- In contrast, since 2004 at Basel Hosp.: contact precautions discontinued for all patients with CDI unless NAP-1 strain or patient with stool incontinence
- All CDI patients were instead treated by standard precautions and dedicated toilet
- All contacts (median duration of exposure 5 days) to index case were screened for toxigenic C. diff by rectal swabs, DNA sequencing of isolates done to see if related, and clinical course in hospital and after discharge followed
Detection of toxigenic *C. difficile* 
\[ n = 881 \]

Clinical confirmation of *C. difficile* infection 
\[ n = 750 \]
Colonization 
\[ n = 131 \]

Exposure to patients with *C. difficile* infection during hospitalization

Exposed contact patients 
\[ n = 493 \]

Detection of toxigenic *C. difficile* 
\[ n = 27 \]

No detection of toxigenic *C. difficile* 
\[ n = 424 \]

Discharged prior to screening 
\[ n = 42 \]

Transmission of toxigenic *C. difficile* 
\[ n = 6 \]

*C. difficile* infection 
\[ n = 2 \]

*C. difficile* infection 
\[ n = 2 \]

*C. difficile* infection 
\[ n = 1 \]
From: Transmissibility of Clostridium difficile Without Contact Isolation: Results From a Prospective Observational Study With 451 Patients

Clin Infect Dis. 2016;64(4):393-400. doi:10.1093/cid/ciw758

Figure Legend:
Incidence of Clostridium difficile infection (CDI) per 10000 patient-days (black line), absolute numbers of CDI cases (blue bars), and transmissions (red bars) during the study period (2004–2013).
Possible conclusions

- Strict attention to standard precautions (gloves and handwashing) plus dedicated toilet may be very effective means to control C. diff. The authors state they have excellent hand hygiene compliance at their facility.
- They attribute their increasing overall C. diff rate to lack of an ASP at their hospital, not to nosocomial transmission. ECHO anyone?
- Maybe we should not use contact isolation in our patients, particularly in carriers or continent patients???
Maybe vancomycin taper regimen is as (in)effective as Stool transplant?

Oral Vancomycin Followed by Fecal Transplantation Versus Tapering Oral Vancomycin Treatment for Recurrent Clostridium difficile Infection: An Open-Label, Randomized Controlled Trial
Susy S. Hota Valerie Sales George Tomlinson Mary Jane Salpeter Allison McGeer Bryan Coburn David S. Guttman Donald E. Low Susan M. Poutanen
Rates of Cure without Relapse for Recurrent *Clostridium difficile* Infection.

![Graph showing rates of cure without relapse for different treatments.](Image)
30 recurrent C. diff patients- randomized to either vancomycin taper or fecal transplant

Vancomycin taper regimen
• 14 days – vanco 125mg QID
• 7 days- 125mg BID
• 7 days – 125mg daily
• 7 days- 125mg every other day
• 7 days – 125mg every 3rd day

Fecal transplant regimen
• 14 days of vanco 125mg QID
• Wait 2 days, then receive fecal transplant enema
There is no accepted protocol for fecal transplant

- Method of administration: enema, colonoscopy, NG tube / fresh vs frozen
- Patients on suppressive therapy vs. acute infection. This study used acute infection.
- This study pretreated with Vancomycin before the FT, may have negatively effected the stool transplant micro flora as vanco hangs around for at least 5 days
- Frequent irritable bowel symptoms after vanco treatment confounds true incidence of recurrence
Remember....
C. diff colitis (CDI) is foremost a **Clinical Diagnosis** that is only then confirmed by lab tests. It is not simply a + lab test result.

- **Watery diarrhea (Bristol 7)** is the cardinal symptom of C. difficile–associated diarrhea (CDI) with colitis (≥3 loose stools in 24 hours). Other manifestations include lower abdominal pain and cramping, low-grade fever, nausea, anorexia, and leukocytosis.
On one end of the spectrum- severe disease: PCR+/NAP-1+ CDI Case presentation

• Spring 2016, 84 year old male receives ciprofloxacin for bacteriuria. Develops *C. difficile* colitis (PCR+/NAP-1+) . Treated with oral metronidazole.

• Subsequently, has 4 CDI relapses. Treated with oral metronidazole and oral vancomycin

• Undergoes successful stool transplant October, 2016

• Has a fall at home and admitted to hospital January 2017. Given ampicillin for possible cellulitis. In hospital, develops watery diarrhea; within a day progresses to hypotension, lactic acidosis, WBCs 35,000 and renal failure. Abdomen distended, tender no bowel sounds. Stool again shows *C. diff* PCR+/NAP-1+

• Day #3 of illness goes for sub-total colectomy. On pressors, dialysis, respirator
Another PCR +Case

• 53 year old woman has extensive, uncomplicated plastic surgery, normal procedure is to keep patient overnight in hospital before discharge. Hospital crowded, only room available in ICU. Goes home next day on Keflex for a few days.

• One week later – profuse watery diarrhea, C. diff PCR positive. Treated with metronidazole for 10 days. Diarrhea resolves

• Sent for f/u C. diff test to confirm cure- PCR positive, placed on Vancomycin 125mg cap QID for 10 days. Asymptomatic

• Sent for another f/u test- PCR still positive, given RX for Vanco 500mg QID- costs her nearly $2000. ID consult obtained…
A third PCR + C. Diff case

- 28 year old male presented with abd pain and diarrhea (>10 Bristol type 7 stools daily) after a course of Augmentin for pneumonia. Diagnosed with CDI by PCR test positive for the Toxin B gene. Treated with 10 day course of metronidazole with resolution of his symptoms. Returned to baseline 2 to 3 Bristol type 4 stools per day. Starting six weeks later, again had abd discomfort for the next 3 weeks relieved by bowel movements with increased stool frequency (4 to 5 type 4 stools per day). PE showed a soft abdomen, WBC was 7.8, and repeat stool test for C. difficile toxin PCR was again positive. **What would you do next?**

- Diagnose recurrent C. diff infection (CDI) and prescribe another course of metronidazole
- Diagnose severe CDI and prescribe oral vancomycin
- Diagnose refractory CDI and consider fecal stool transplant
- Diagnose postinfectious altered bowel habits with C. diff colonization and recommend a high-fiber diet