ED Antimicrobial Stewardship Collaborative: Behavioral Nudging in Practice & Sustaining Strategies
September 11, 2018
## Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>12-12:05PM</td>
<td>Welcome, Polling Questions</td>
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<tr>
<td>12:05-1:10PM</td>
<td>Behavioral Nudging in Practice &amp; Sustaining Strategies</td>
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<tr>
<td>1:10-1:30PM</td>
<td>Discussion and Provider Survey Updates</td>
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Objectives

- Review behavioral nudging program elements and tools
- Discuss practical methods to implement nudging protocols in the ED setting
- Share and provide ED quality improvement project progress
PRE-PRESENTATION POLL QUESTIONS
Are you familiar with the concept of behavioral economics or nudging?

- No, this is a new concept for me.
- I’ve heard of it, but couldn’t tell you much about it.
- Are you kidding? I’m an expert and should be giving this presentation.
Are you aware of any programs or initiatives in your institution that employ behavioral economics or nudging?

- Yes
- No
- Not sure
BEHAVIORAL NUDGING IN PRACTICE & SUSTAINING STRATEGIES
Nudge Toolkit
Behavioral Science

Behavioral Econ

Marketing

Incentive design
Attribute evaluation
Search
Task effects
Incentive design
Preferences
Scarcity
Punishment
Coordination

Experimental Econ

System 1 & 2
Choice architecture

Behavior Design & Persuasive Tech

Prospect theory
Framing

Habits
Barriers
Triggers
Attention
Memory
Perception
Language
Metacognition

Cognitive Psych

Social Psych

Beliefs
Consistency
Social influence
Persuasion science
Group dynamics

Health Psych

Self-efficacy
Stages of change

Personality Psych

Traits
Emotions
Motivation

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Nudge

• Not a mandate
• Easy to avoid
• Low cost
- Is a mandate
- Hard to avoid
- High cost
✓ Not a mandate
✓ Easy to avoid
✓ Low cost
Multiple effects at play
Illustrative examples of general principles
General directions vs. definitive answers
Nudge Toolkit

Nudging through choice design
  1. Defaults
  2. Active Choice

Nudging through others
  3. Identifiability
  4. Social Comparisons

Nudging through self
  5. Consistency
Tool #1: Defaults
Tool #1: Defaults

- There is always a default option
- We're all a bit lazy
  - Or: we are psychologically committed to options for irrational reasons
- Result: We tend to stick with the default option


Case Study: Specialty Network Curation

- Significant variation in episode costs, patient access/service, and quality of collaboration
- Used episode cost data to re-curate our specialist network preferences
- How do we steer to our newly-preferred specialty partners... and “uninstall” existing behaviors?
Implementing Defaults
Tool #2: Active Choice
Tool #2: Active Choice

Requiring a choice (but not a specific choice) can increase consideration of alternatives

“Passive” Choice

- Patients could start a video visit from the primary screen in our app
- No patient marketing
- During the experiment period, less than 2% of home screen views resulted in a video visit
- Classic “Swiss Army knife” design
How can we help you?

- Physical
- Follow up
- Cold, flu, or cough
- Sinus infection
- Urinary tract infection (UTI)
- Skin issues
- Nausea, vomiting, or diarrhea
Good news! We can often treat "cold, flu, or cough" faster with a Video Visit.

**Video Visit**
Fast, on-demand, free

Or continue booking...

**Office Visit**
Personal, on-site appointment
Required Active Choice

32.7% video visit
67.3% office visit
Case Study: Generic Prescribing

- Our EMR does not automatically convert proprietary name (lipitor) to generic (atorvastatin)
- This is usually ok, as pharmacies often fill as generic
- However, this practice can cause several issues:
  - Patients might think brand is the intent when brand name is used
  - Sometimes filled as brand even without DAW
Prescribing Interface

Prescribing interface shows brand and generic names, but prescribes exactly what was selected

Sent as brand
Adding Active Choice

Added atorvastatin as a synonym for lipitor, creating a hot trigger directly in the ordering process.
Impact of Active Choice

Augmentin: $\chi^2 (1, N = 2,105) = 323.76$, $p < .001$; Valtrex: $\chi^2 (1, N = 5,209) = 195.77$, $p < .001$
Tool #3: Identifiability
Tool #3: Identifiability

● People do things for people they know
● Related to: identifiable victim effect, vividness effects, self-consistency

Designing for Identifiability

Andrew Diamond, MD, PhD added a new task

Ordered by Andrew Diamond, MD, PhD
Case Study: Flu Vaccine Natural Experiment

- All patients received an automated flu vaccine order
- Order appears in mobile app
- Vaccine was ordered by PCP (name) or “Med Team”
Flu Vaccine Natural Experiment

% of patients who viewed mobile task and completed flu vx

Ordered by Med Team
43.6%

or

Ordered by Andrew Diamond, MD, PhD
53.1%
+21.8%

χ² (1, N = 10,512) = 34.27, p < .001
Tool #4: Social Comparisons
Tool #4: Social Comparisons

● Social comparisons are descriptive norms that signal acceptable or appropriate contextual behavior

● One of many social influence effects


Tool #5: Consistency
Tool #5: Consistency

- We like to maintain our self-concept/self-identity
- As a result, we strive to be consistent with former self and ideal self (also related to dissonance)

...We know that giving is important to you, as you have given in the past:

<table>
<thead>
<tr>
<th>Last Donation</th>
<th>2017 Gift Amount</th>
<th>2018 Gift Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/27/2017</td>
<td>$100</td>
<td>$0</td>
</tr>
</tbody>
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Nudge Toolkit

Nudging through choice design
1. Defaults
2. Active Choice

Nudging through others
3. Identifiability
4. Social Comparisons

Nudging through self
5. Consistency
Limitations

1. Lack of ability (no time, knowledge gap)
2. Lack of motivation (don’t care)
3. Strong prior beliefs
Make it easy
DOING WHAT'S BEST FOR OUR PATIENTS

Antibiotic Stewardship in the Emergency Department

Larissa May, MD, MSPH
Associate Professor, Emergency Medicine
Director of Emergency Department Antibiotic Stewardship
University of California-Davis
WHERE DO WE WANT TO BE?

Every patient gets optimal antibiotic treatment
Antibiotics only when they are needed
If needed
  Right antibiotic
  Right dose
  Right duration

Antibiotic stewardship is the effort to measure and optimize antibiotic use
HOW CAN WE CHANGE CLINICIAN ANTIBIOTIC PRESCRIBING PRACTICES?

- Identify effective interventions to improve outpatient antibiotic prescribing
- Adapt them to the local context
- Use rigorous implementation science methods before and after
- Disseminate for broader uptake (scale and spread)
Public Commitment as a Motivator for Weight Loss

Prashanth U. Nyer
Chapman University

Stephanie Dellande
University of New Orleans

Figure 2. The effect of public commitment on weight loss.

I'm running 8 miles on Saturday and riding my bike 50 miles on Monday. Hoping if I put these things out there, that they will actually happen. :)

State your own workout goals below. Let's help hold each other accountable through the holiday weekend.
PUBLIC COMMITMENT POSTERS

• Simple intervention: poster-placed in exam rooms with provider picture and commitment to use antibiotics appropriately

• Principle of behavioral science: desire to be consistent with previous commitments

  “As your doctors, we promise to treat your illness in the best way possible. We are also dedicated to avoid prescribing antibiotics when they are likely do to more harm than good.”

• Adjusted absolute reduction: -20% compared to controls

Nudging Guideline-Concordant Antibiotic Prescribing: A Randomized Clinical Trial

Daniella Meeker, PhD; Tara K. Knight, PhD; Mark W. Friedberg, MD, MPP; Jeffrey A. Linder, MD, MPH; Noah J. Goldstein, PhD; Craig R. Fox, PhD; Alan Rothfeld, MD; Guillermo Diaz, MD; Jason N. Doctor, PhD
Effect of Behavioral Interventions on Inappropriate Antibiotic Prescribing Among Primary Care Practices: A Randomized Clinical Trial

Daniella Meeker, PhD; Jeffrey A. Linder, MD, MPH; Craig R. Fox, PhD; Mark W. Friedberg, MD, MPP; Stephen D. Persell, MD, MPH; Noah J. Goldstein, PhD; Tara K. Knight, PhD; Joel W. Hay, PhD; Jason N. Doctor, PhD
PEER COMPARISON TO TOP PERFORMERS

• “You are a Top Performer”

• “You are not a Top Performer”

• Mean antibiotic prescribing decreased from 19.9% to 3.7% (-16.3%)

CHANGING BEHAVIOR

- ** Implicit model:** clinicians reflective, rational, and deliberate
  - “Educate” and “remind” interventions

- **Behavioral model:** decisions fast, automatic, influenced by emotion and social factors
  - Cognitive bias
  - Appeal to clinician self-image
  - Consider social motivation
• **Nudge**: gentle, non-intrusive persuaders which influence choice in a certain direction
  • Different frames, default rules, feedback mechanisms, social cues
  • Can be ignored
  • A good nudge will only affect choice when there are not strong reasons for the decision
MITIGATE ANTIMICROBIAL STEWARDSHIP TOOLKIT

A guide for practical implementation in adult and pediatric emergency department and urgent care settings

Presented By:
Larissa May, MD, MSPH
Director of ED and Outpatient Antibiotic Stewardship, UC Davis Health
INTRODUCTION

• This guide is written for healthcare providers and administrators interested in designing quality improvement programs in antimicrobial stewardship.
• This guide outlines how facilities can implement individualized, effective, and practical antimicrobial stewardship programs in acute care (emergency department and urgent care) settings.

• Acknowledgements
  • Allyson Sage
  • Benjamin Mooso
  • Katherine Fleming Dutra
  • Lauri Hicks
  • Reagan Miller
  • Richard Kravitz
  • Sara Cosgrove

  *This work was supported by CDC’s investments to combat antibiotic resistance under award number 200-2016-91939; **Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.*
**PRINCIPLES: CORE MEASURES**

- **Commitment:** Demonstrate dedication to and accountability for optimizing antibiotic prescribing and patient safety.

- **Action for policy & practice:** Implement at least one policy or practice to improve antibiotic prescribing, assess whether it is working, and modify as needed.

- **Tracking & reporting:** Monitor antibiotic prescribing practices and offer regular feedback to clinicians, or have clinicians assess their own antibiotic prescribing practices themselves.

- **Education & expertise:** Provide educational resources to clinicians and patients on antibiotic prescribing, and ensure access to needed expertise on optimizing antibiotic prescribing.
MITIGATE consists of simple strategies to engage patients and providers in understanding appropriate antibiotic prescribing. These strategies can be individualized to each site to ensure they fit within the culture and workflow of the organization.
## COMPONENTS

<table>
<thead>
<tr>
<th>Clinical Champion</th>
<th>Institutional Leadership (Chief Quality Officer or Chief Medical Officer)</th>
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<tbody>
<tr>
<td>The &quot;face&quot; of the intervention. Lead the interventions, serve as a resource for education, serve as liaison between the department and administration.</td>
<td>Sponsor the program and provide institutional administrative and programmatic support for implementation and evaluation.</td>
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<tr>
<th>Departmental Director</th>
<th>Information Technology Specialist</th>
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<tr>
<td>Refine standard operating procedure and develop provider enrollment procedures (electronic, in-person).</td>
<td>Data extraction for performance reports. Framework for regular personalized feedback for peer comparison.</td>
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<tr>
<th>Nursing Leadership</th>
<th>Program Manager</th>
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<tr>
<td>Guide clinical workflow review and refine standard operating procedure.</td>
<td>Develop monitoring plan to ensure interventions are delivered with fidelity, and record modifications.</td>
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1. Identify key stakeholders and potential champions
2. Conduct stakeholder interviews and engagement
3. Conduct surveys
4. Compile data
Table 1. Intervention Components

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<thead>
<tr>
<th>Component</th>
<th>Definition</th>
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<tr>
<td>Provider Education</td>
<td>Educational presentations, smartphone apps, CDC Be Antibiotics Aware brochures.</td>
</tr>
<tr>
<td>Patient Education</td>
<td>CDC Be Antibiotics Aware posters in waiting rooms, Choosing Wisely brochures, discharge handouts.</td>
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<tr>
<td>Provider Commitment</td>
<td>Physician-worn “flair” (pens, pins, badge reels, etc.) that are thematically consistent with the CDC Be Antibiotics Aware posters and brochures.</td>
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<tr>
<td>Departmental Feedback</td>
<td>Monthly aggregate of antibiotic prescribing practices for ARI from electronic health record data provided to departmental leadership.</td>
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<tr>
<td>Provider Feedback and Education</td>
<td>Case-based educational rounds with a stewardship consulting service (if available). Alternatively, ED pharmacists can provide consultations for patient-related issues.</td>
</tr>
<tr>
<td>Peer Comparison using Personalized Audit and Feedback</td>
<td>Personalized monthly performance rankings with each physician receiving a designation of being a “top performer” (top decile) or “not a top performer” for appropriate antibiotic Rx for ARI delivered by email.</td>
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*Peer comparison will be distinct from traditional audit-and-feedback interventions in its comparison with top-performing peers instead of group performance, and its validated benefit of delivery of positive reinforcement to top performers. Norms will be computed within each setting within each site.

Launch Do’s and Don’ts

| Do send out announcement email letting staff know when program will be starting | Don’t pick a week where staff might be out (conferences, retreats, etc.) |
| Do bring awareness to the program by presentations or holding information sessions | Don’t start on a weekend |
| Do have extra flair and materials | Don’t begin activities without prior announcement and engagement of stakeholders |
Data Extraction

Acute respiratory infections (ICD-10)

- Abx not appropriate (e.g. acute bronchitis)
- Abx sometimes appropriate (e.g. pharyngitis)

Antibiotics prescribed (RxNorm)

- Modifying conditions (ICD-10)
  - Comorbid conditions (COPD, HIV/AIDS)
  - Other infections (UTI, pneumonia)
Peer Comparison

• Feedback helps clinicians monitor own behavior and make changes based on their real prescribing habits
• Monthly email intervention EHR data about inappropriate prescription rates
• Clinicians are ranked from highest to
• Rankings are typically only shared with the program team and administration, however sites may choose to share rankings with all clinicians.
• Clinicians with the lowest inappropriate prescribing rates (the top-performing 10th percentile) will be informed that they are a “top performer” in a congratulatory email.
• Remaining clinicians will be told that they are “not a top performer”.
• Emails include the #/proportion of inappropriate antibiotic Rx written for a month for non-antibiotic-appropriate ARI cases and proportion written by Top Performers.
• Be specific in the language used for provider feedback
POST-PRESENTATION POLL QUESTION
Are there programs or initiatives in your institution that employ behavioral economics or nudging, but are not currently applied to antibiotic stewardship in the ED?

- Yes
- No
Discussion Questions

• What types of resources are needed to implement nudging strategies to support antibiotic stewardship in your ED?

• What are the barriers/limitations to implementing nudging strategies in your ED or institution?
ED Collaborative Participants: Provider Survey Updates

3 of 14 participating ED disseminated a provider survey

- How many physicians did you send the survey to?
- What was the response rate?
- How did you disseminate the survey link?
- Did you send reminders?
- Did you offer any incentives?
- Did any of the results come as a surprise?
- How do you plan to use the data from the surveys?
NEXT STEPS
Next Steps

- Check-in, technical support for interested EDs
- Next Sessions

**Southern California**
January 31, 2019, 10-12:30PM
LACDPH, 241 N. Figueroa St, Room 152, Los Angeles, CA

**Northern California**
February 11, 2019, 1-3:30PM
CDPH, 850 Marina Bay Pkwy, Room C-160, Richmond, CA
Questions?

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