

ED Antimicrobial Stewardship Collaborative: Behavioral Nudging in Practice & Sustaining Strategies

September 11, 2018

Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health



Agenda

12-12:05PM	Welcome, Polling Questions
12:05-1:10PM	Behavioral Nudging in Practice & Sustaining Strategies
1:10-1:30PM	Discussion and Provider Survey Updates



WELCOME



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



SEATTLE

SF BAY AREA

PHOENIX

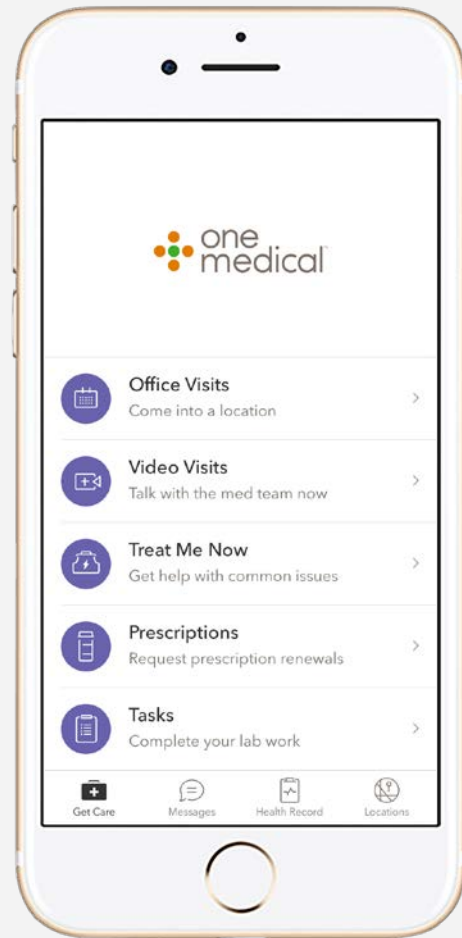
LOS ANGELES

CHICAGO

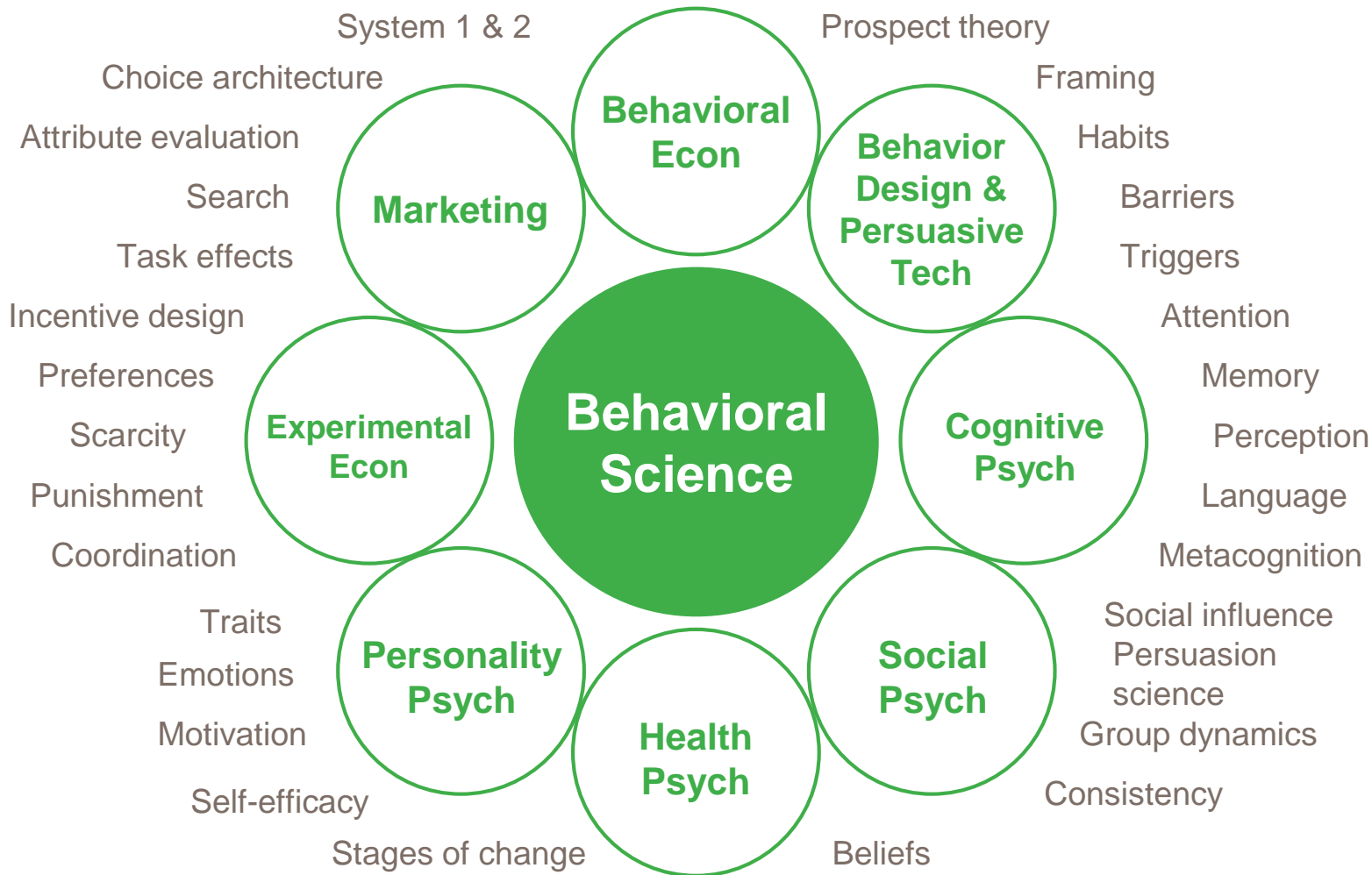
WASHINGTON

BOSTON

NEW YORK CITY







Nudge

- Not a mandate
- Easy to avoid
- Low cost



- x Is a mandate
- x Hard to avoid
- x 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

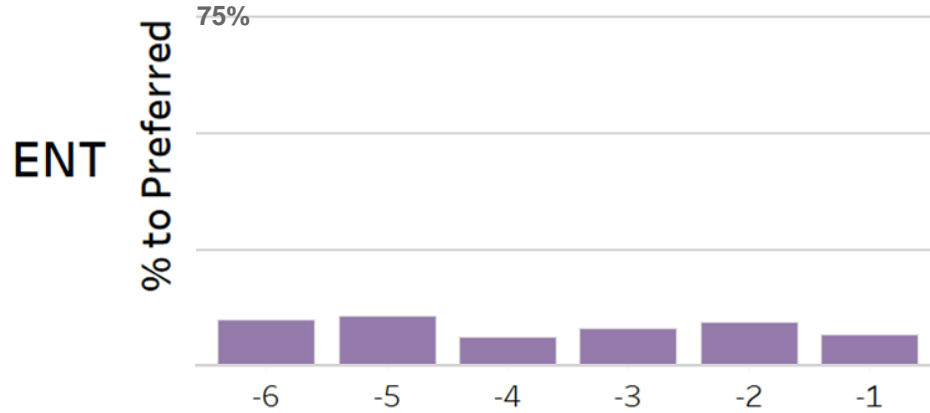
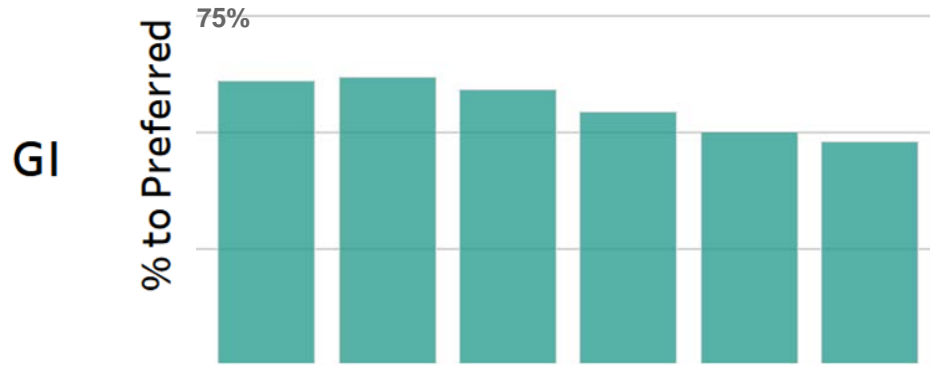
Tool #1: Defaults

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

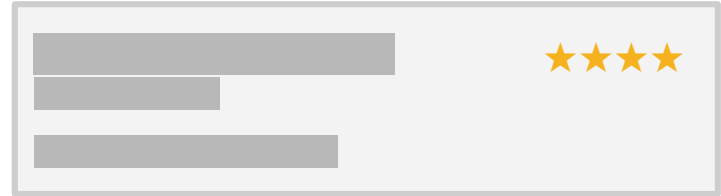
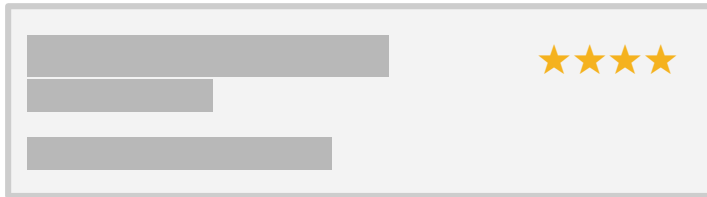
Case Study: Specialty Network Curation

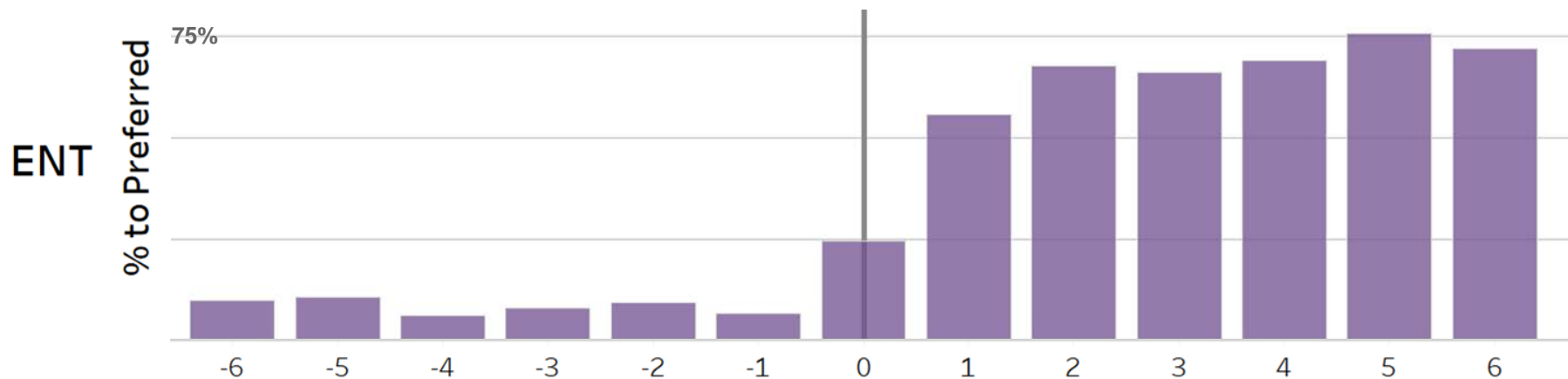
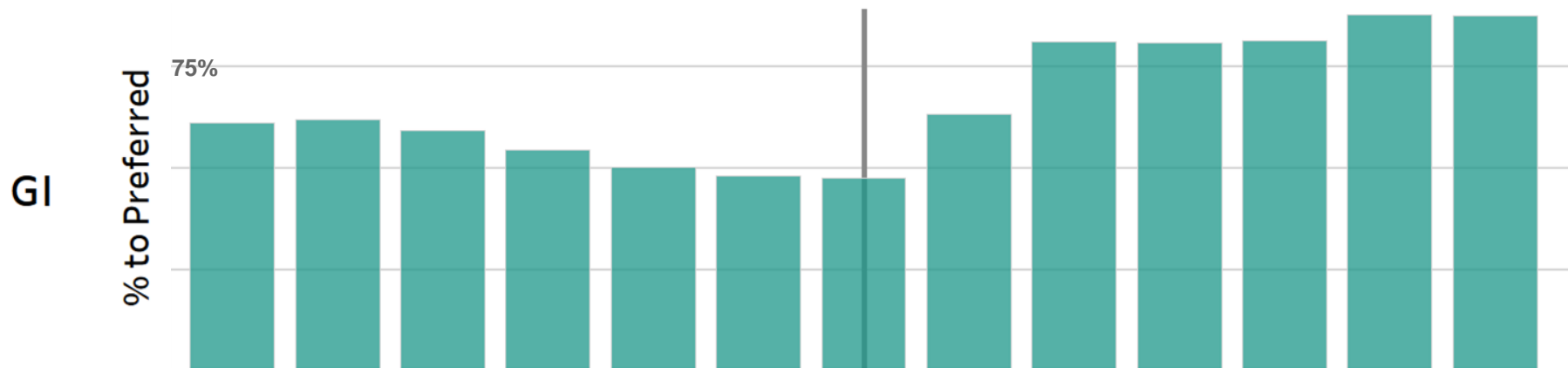
- Significant variation in episode costs, patient access/service, and quality of collaboration
- Used episode cost data to re-curate our specialist network preferences
- How do we steer to our newly-preferred specialty partners... and “uninstall” existing behaviors?



Relative Months from Ranking Change

Implementing Defaults





Relative Months from Ranking Change

Tool #2: Active Choice

Tool #2: Active Choice

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

Highly Recommended:
Trip Protector

+ \$25.86 All flights
per passenger

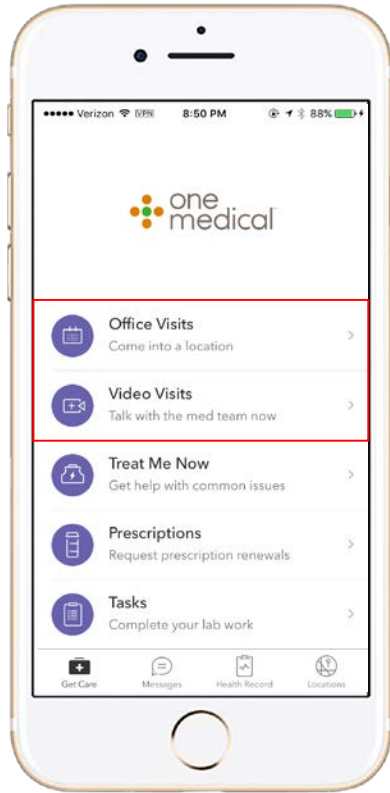
Yes, Add Trip Protector for **\$25.86** covering all passengers in this reservation.

All these benefits for a fraction of the ticket cost:

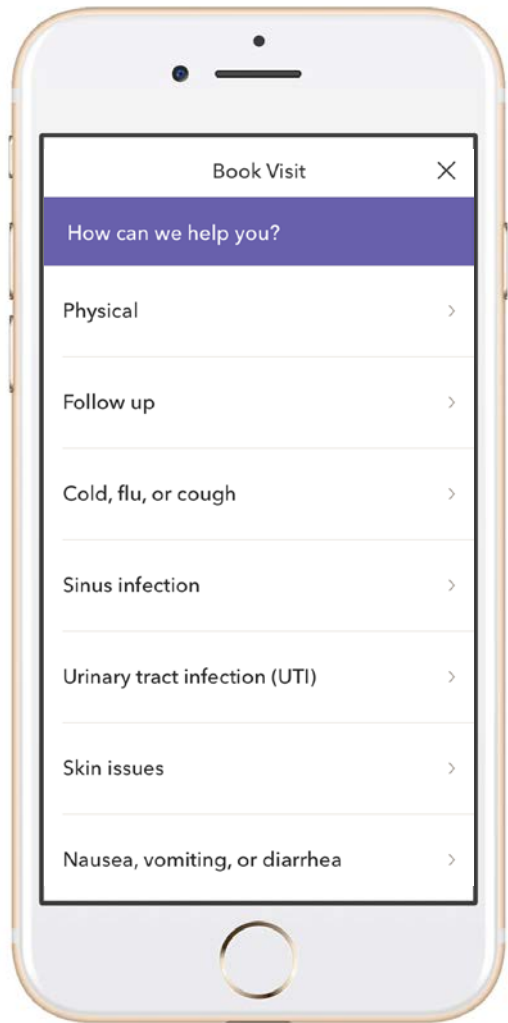
- Reimburses costs if you have to cancel or interrupt your trip for reasons like covered illness, injury, layoff, and more
- Coverage for additional expenses associated with travel delay
- 24/7 award-winning assistance service

No, I choose not to protect my **\$470.20** purchase. I understand by declining coverage I am responsible for all cancellation fees and delay expenses.

“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



Book Visit



How can we help you?

Physical



Follow up



Cold, flu, or cough



Sinus infection



Urinary tract infection (UTI)

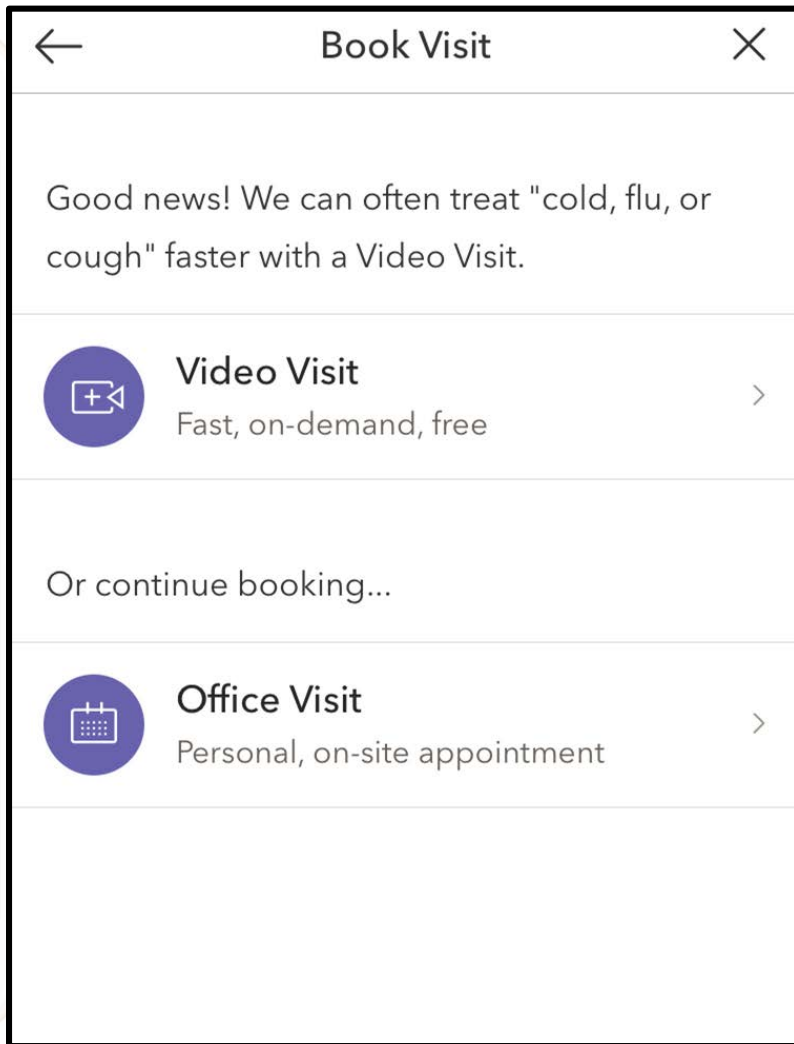
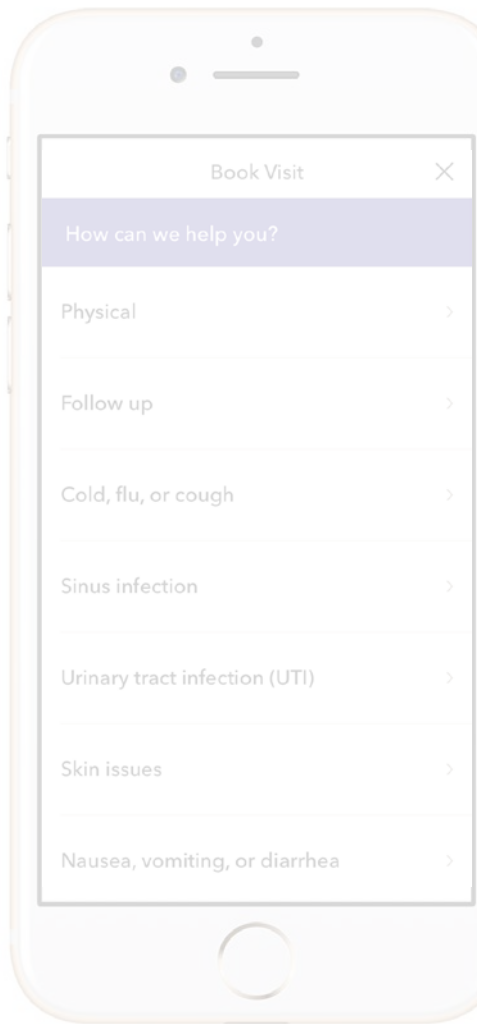


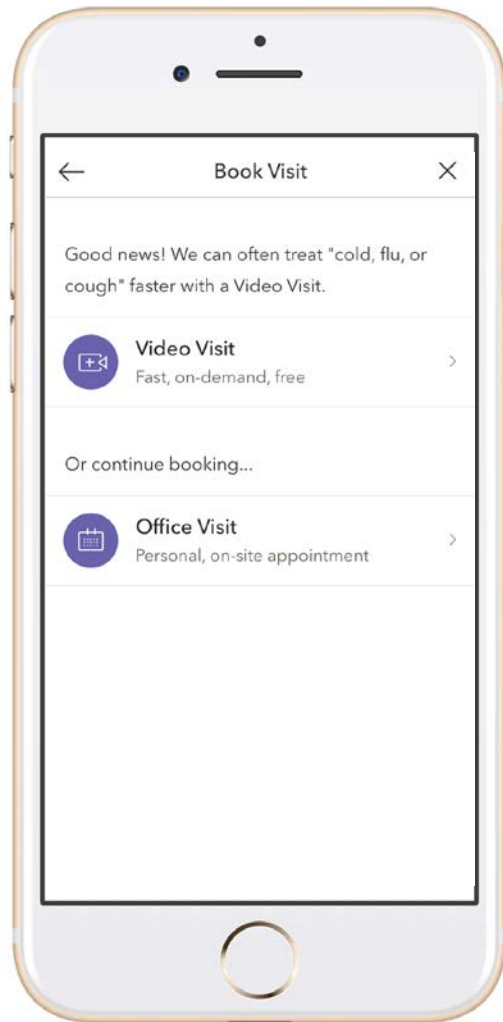
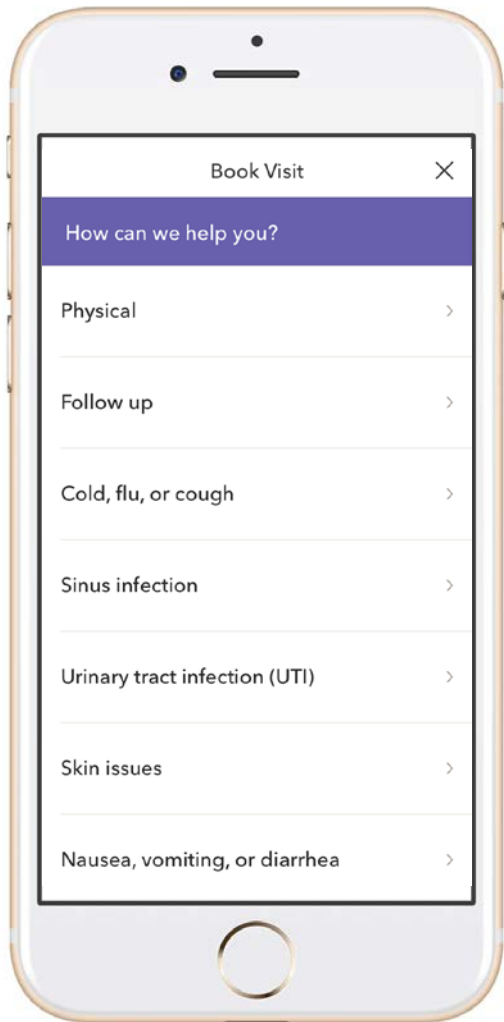
Skin issues



Nausea, vomiting, or diarrhea







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

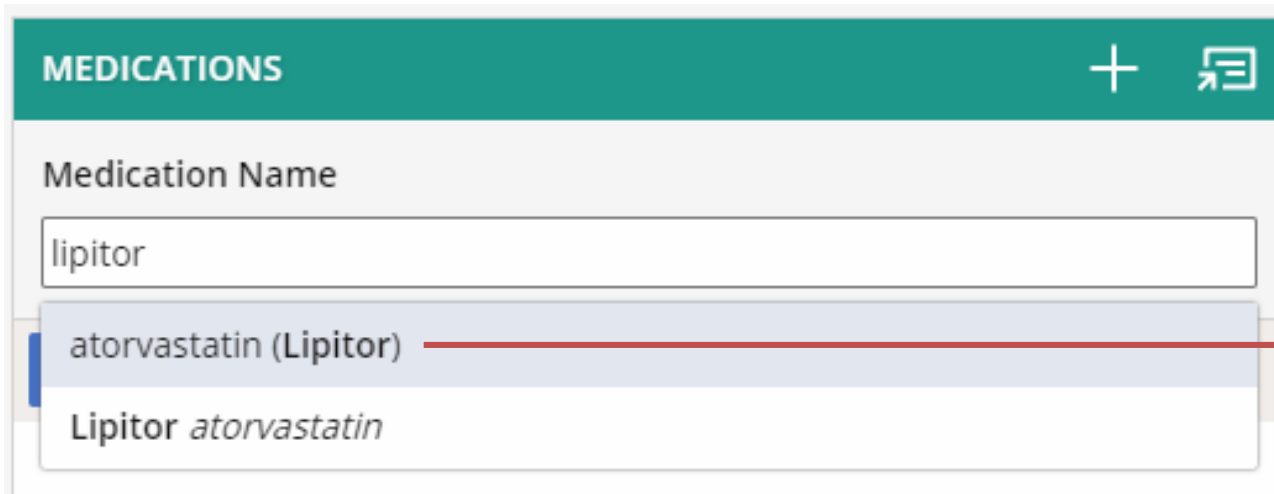


The screenshot shows a mobile application interface for prescribing medications. At the top, there is a teal header with the word "MEDICATIONS" on the left, a plus sign in the center, and a list icon on the right. Below the header is a search bar labeled "Medication Name" containing the text "lipitor". A dropdown menu is open below the search bar, displaying the selected item "Lipitor atorvastatin". A red arrow points from the text "Lipitor atorvastatin" in the dropdown to the text "Sent as brand" on the right side of the slide.

Sent as brand

Adding Active Choice

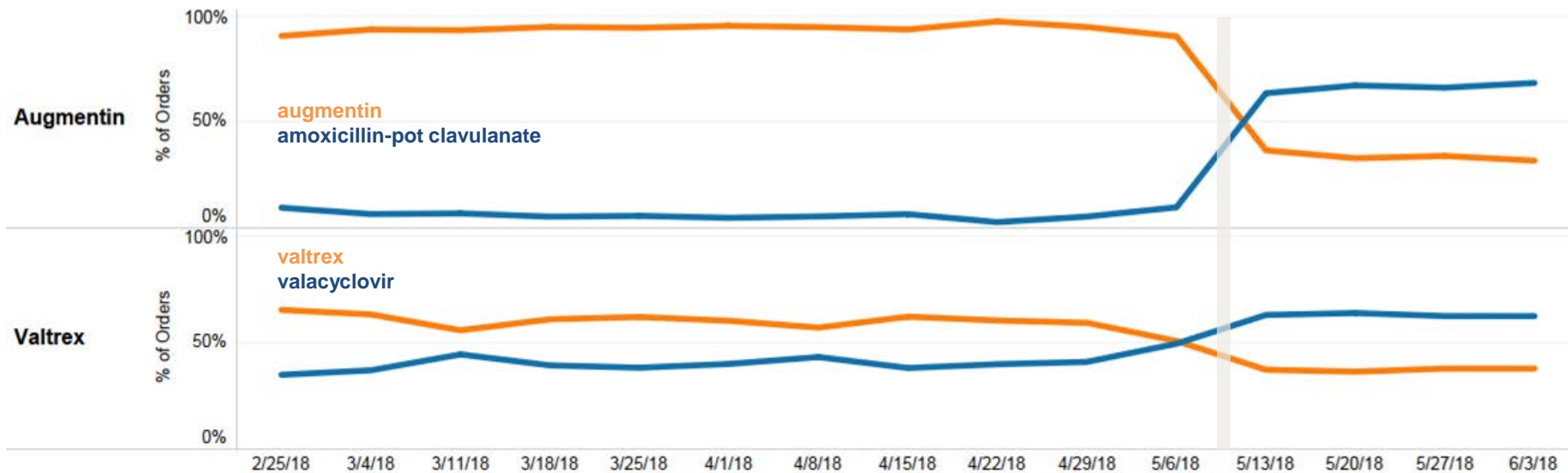
Added atorvastatin as a synonym for lipitor, creating a hot trigger directly in the ordering process



The screenshot shows a software interface for adding medications. At the top is a teal header with the word "MEDICATIONS" in white, a plus sign icon, and a list icon. Below the header is a light gray section with the label "Medication Name". A white text input field contains the text "lipitor". Below the input field is a dropdown menu with three options: "atorvastatin (Lipitor)", "Lipitor atorvastatin", and a partially visible third option. The "atorvastatin (Lipitor)" option is highlighted with a blue bar on the left. A red arrow points from this option to the right.

Sent as generic

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



vs.

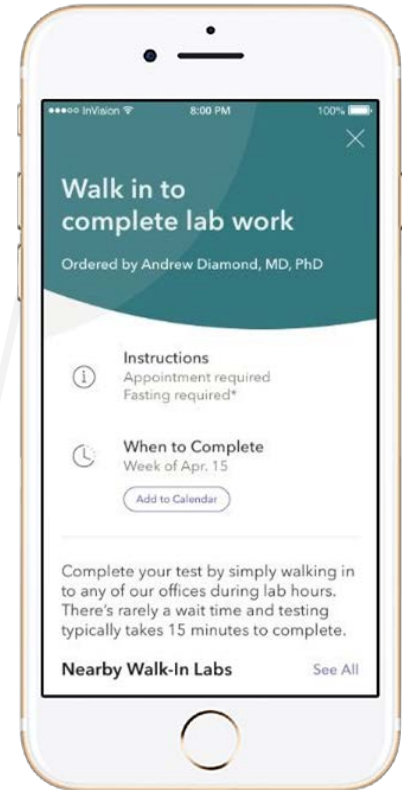


Designing for Identifiability



Andrew Diamond, MD,
PhD added a new task

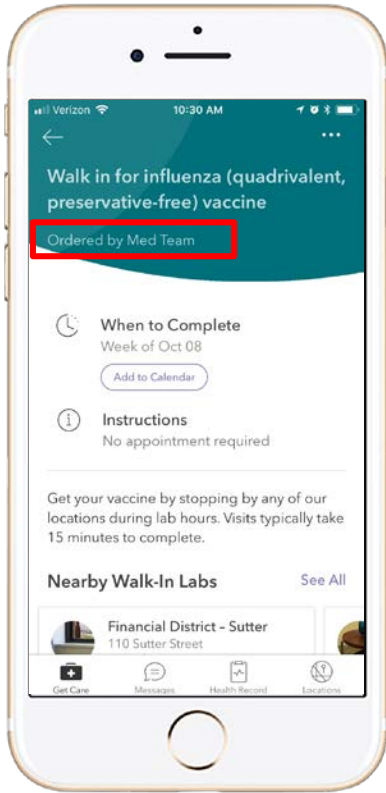
Ordered by Andrew
Diamond, MD, PhD



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

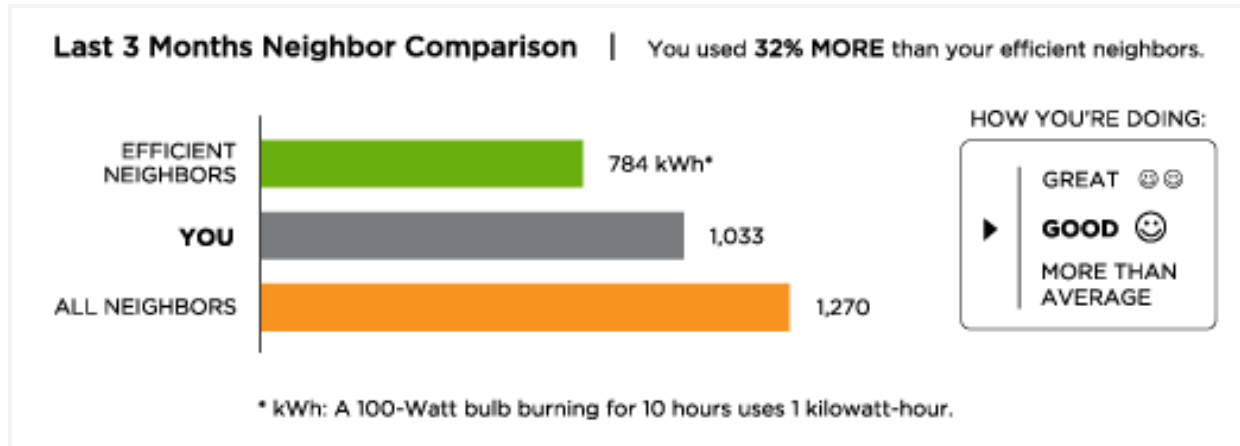
53.1%
+21.8%

$\chi^2(1, N = 10,512) = 34.27, p < .001$

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



Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annu. Rev. Psychol.*, 55, 591-621.

Kallgren, C. A., Reno, R. R., & Cialdini, R. B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior. *Personality and social psychology bulletin*, 26(8), 1002-1012.

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:

Last Donation	2017 Gift Amount	2018 Gift Amount
12/27/2017	\$100	\$0

Recap

Nudge Toolkit

Nudging through choice design

1. Defaults
2. Active Choice

Nudging through others

3. Identifiability
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Nudging through self

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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

PUBLIC COMMITMENT

Meals and Miles
Thursday

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.

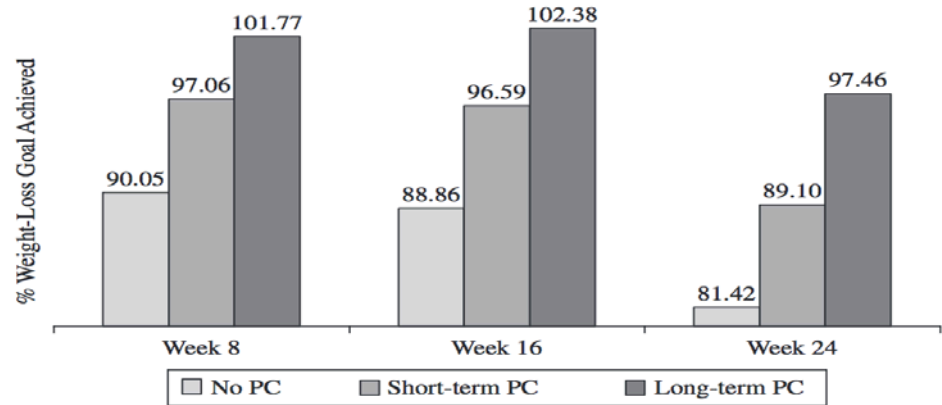


Figure 2. The effect of public commitment on weight loss.

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**

PUBLIC COMMITMENT

JAMA Internal Medicine

Original Investigation

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

Meeker D, Knight TK, Friedberg MW, Linder JA, Goldstein NJ, Fox CR, Rothfeld A, Diaz G, Doctor JN.

JAMA The Journal of the
American Medical Association

 ORIGINAL CONTRIBUTION

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

Daniella Meeker, Jeffery Linder, Mark W. Friedberg, Stephen D. Persell, Craig R. Fox, Noah J. Goldstein, Alan F. Rothfeld, Joel Hay, Jason N. Doctor

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

NUDGES TARGET AUTOMATIC THINKING

- **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



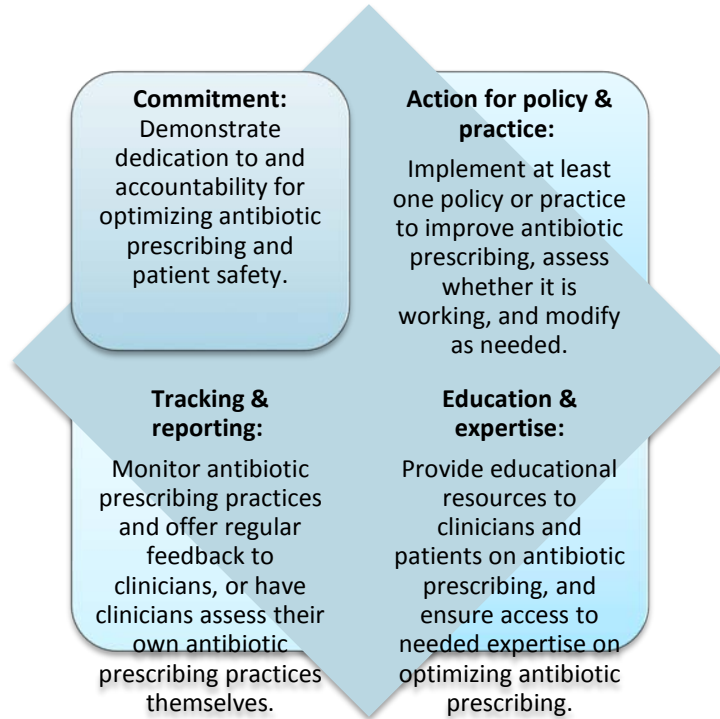
**BE
ANTIBIOTICS
AWARE**

SMART USE, BEST CARE

- ***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.

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PRINCIPLES: CORE MEASURES



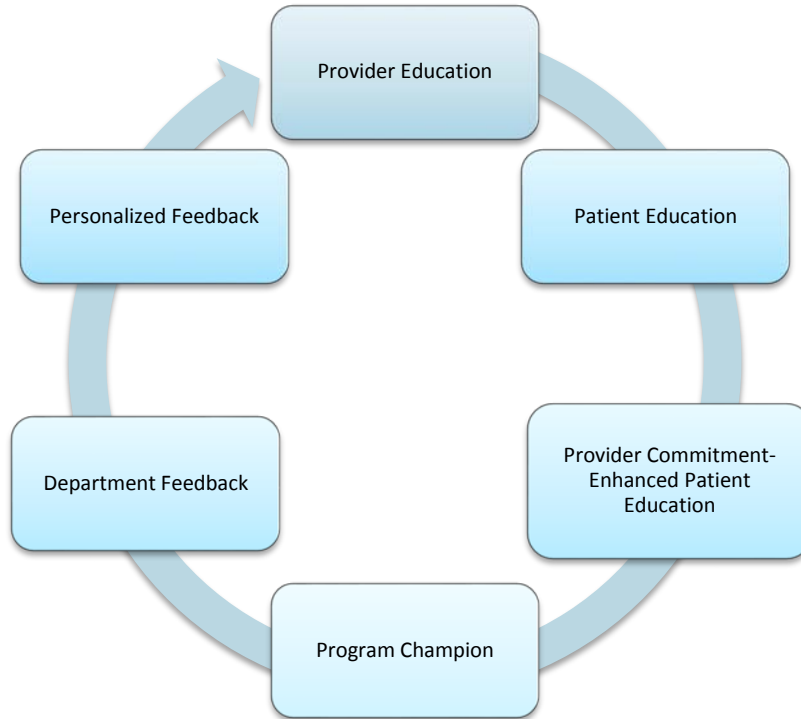
Commitment:
Demonstrate dedication to and accountability for optimizing antibiotic prescribing and patient safety.

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.







TOOLS



In summary

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


	<p>Clinical Champion</p> <p>The "face" of the intervention. Lead the interventions, serve as a resource for education, serve as liaison between the department and administration.</p>		<p>Institutional Leadership (Chief Quality Officer or Chief Medical Officer)</p> <p>Sponsor the program and provide institutional administrative and programmatic support for implementation and evaluation.</p>
	<p>Departmental Director</p> <p>Refine standard operating procedure and develop provider enrollment procedures (electronic, in-person).</p>		<p>Information Technology Specialist</p> <p>Data extraction for performance reports.</p> <p>Framework for regular personalized feedback for peer comparison.</p>
	<p>Nursing Leadership</p> <p>Guide clinical workflow review and refine standard operating procedure.</p>		<p>Program Manager</p> <p>Develop monitoring plan to ensure interventions are delivered with fidelity, and record modifications.</p>

PRE-IMPLEMENTATION


1. Identify key stakeholders and potential champions



2. Conduct stakeholder interviews and engagement



3. Conduct surveys



4. Compile data

PRE-IMPLEMENTATION

Table 1. Intervention Components

Component	Definition
Provider Education	Educational presentations, smartphone apps, CDC <i>Be Antibiotics Aware</i> brochures.
Patient Education	CDC <i>Be Antibiotics Aware</i> posters in waiting rooms, <i>Choosing Wisely</i> brochures, discharge handouts.
Provider Commitment	Physician-worn “flair” (pens, pins, badge reels, etc.) that are thematically consistent with the CDC <i>Be Antibiotics Aware</i> posters and brochures.
Departmental Feedback	Monthly aggregate of antibiotic prescribing practices for ARI from electronic health record data provided to departmental leadership.
Provider Feedback and Education	Case-based educational rounds with a stewardship consulting service (if available). Alternatively, ED pharmacists can provide consultations for patient-related issues.
Peer Comparison using Personalized Audit and Feedback	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. ^{18*}

*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?
-
-



OUR OWN NUDGE



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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Erin Epton - Erin.Epton@cdph.ca.gov

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