

Impact of a Pharmacist-Led Intervention Targeting Appropriate Duration of Therapy of Antibiotics at Hospital Discharge

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Background

Upon discharge, patients are frequently prescribed antibiotics to complete a course of therapy for an acute infection. Prescription durations may or may not include the days of antibiotic therapy received while inpatient. Unfortunately, this may result in patients receiving a total course of antibiotics that is longer than what would be necessary per standard treatment duration recommendations. This can contribute to antimicrobial resistance, increased risk of adverse events, and increased cost.^{1,2} The core principles of antimicrobial stewardship programs include evaluating antimicrobial regimens for appropriate microbial coverage; as well as assessing for correct route of administration, correct dosage, and appropriate duration of therapy.³ Regarding duration of therapy, it has been shown for a variety of infections that a shorter duration is non-inferior to traditional longer dosing regimens.¹ For every additional day of antibiotic therapy, there is a 3.4% increased risk of developing resistance and a 4% increased risk of developing an adverse drug reaction.⁴ Current literature estimates that 38% of antibiotic exposure occurs immediately after hospital discharge, making the transition at discharge an ideal time to evaluate antibiotic regimens.^{5,6} Some studies have shown that as high as 80% of hospitalized patients had already received a full course of antibiotics or more at the time of discharge.¹ Pharmacists involved with transitions of care are uniquely positioned to review antibiotic courses and make appropriate recommendations at discharge. Approximately 25% of recommendations made by pharmacists at transitions of care related to antibiotics are related to the duration of therapy.⁷

Objectives

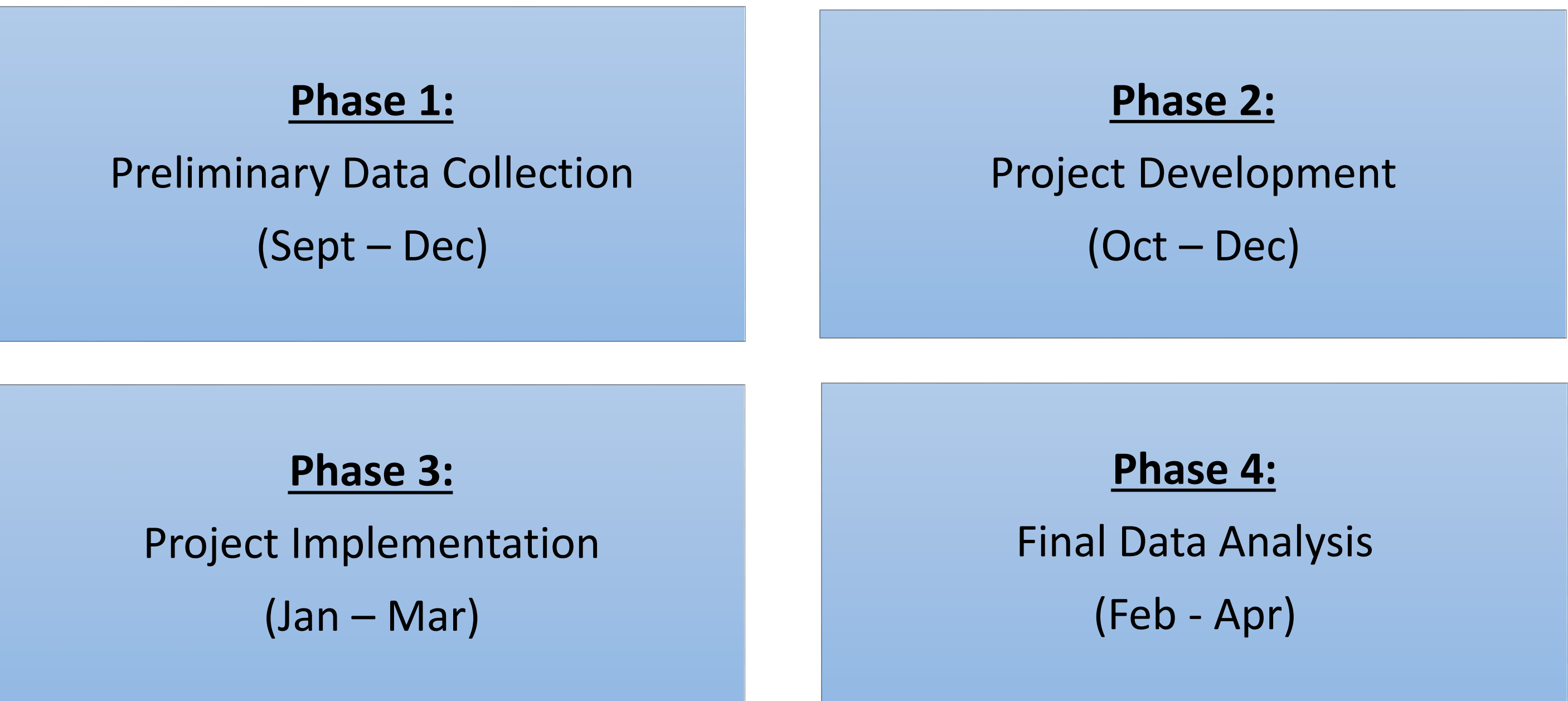
- Primary Objective:** To evaluate the impact of a pharmacist-led intervention targeting duration of antimicrobial therapy prescribed at discharge.
- Secondary Objectives:**
 - Readmission rates within 30 days of discharge
 - Types of pharmacist interventions made at discharge (e.g. dose change, duration, antibiotic choice)
 - Outpatient antibiotic prescribing for the same infection within 30 days
 - Cost-analysis of decreasing overall days of therapy

Identified Indications for Pharmacist Intervention

Indication	Duration
CAP	5 days
HAP	7 days
Acute Bronchitis	0 days
COPD Exacerbation	<5 days
Cellulitis	5-7 days
Uncomplicated UTI	1-5 days (depending on agent)
Complicated UTI, Catheter-Associated UTI, or Pyelonephritis	5-7 days (depending on agent)
Asymptomatic UTI	0 days

Indication	Duration
Diverticulitis	4-7 days
Appendicitis	Uncomplicated: <24 hours
	Complicated: 4 days
Cholecystitis	Surgery within 7 days of symptoms onset: <24 hours
	Surgery more than 7 days from symptom onset: 4 days
Acute Bacterial Sinusitis	5 days
Bacteremia (Gram Negative)	7-14 days

Methods



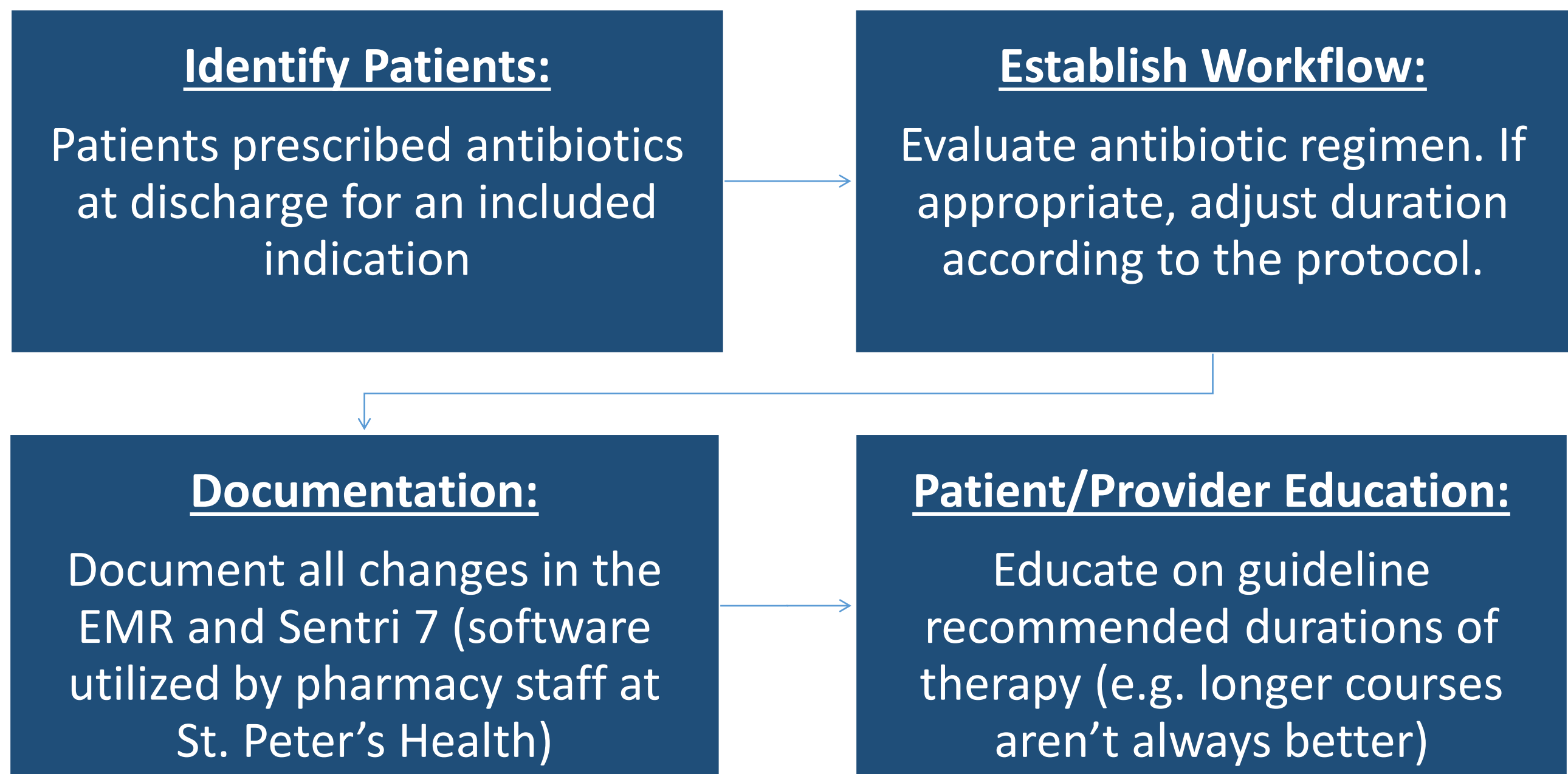
Phase 1: Preliminary Data Collection

Data was collected through reports generated from Meditech (the electronic health record (EHR) used by St. Peter's Health). The data is currently being analyzed via individual patient chart review.

Phase 2: Project Development

- Conduct background research
- Identify stakeholders
- Draft project proposal
- Gain access for data collection
- Identify appropriate indications to include in protocol
- Develop pharmacist workflow
- Develop hospital protocol
- Gain approval from identified stakeholders
- Educate providers on scope of practice

Phase 3: Project Implementation



Phase 4: Final Data Analysis

The following areas will be analyzed through a prospective review:

- Clinical interventions
- Cost analysis
- Readmission rates
- Additional outpatient prescriptions

Identified Inclusion and Exclusion Criteria

Inclusion Criteria:

- Age $\geq$ 18 years
- Clinically improving and no signs of continued infection
- Discharged with at least one of the following infections:
 - Uncomplicated/complicated UTI
 - Asymptomatic UTI
 - CAP/HAP
 - Gram-negative bacteremia
 - COPD Exacerbation
 - Pyelonephritis
 - Sinusitis
 - Appendicitis
 - Cholecystitis
 - Diverticulitis

Exclusion Criteria:

- Age < 18 years
- Pregnancy
- Any of the following infections and/or complications:
 - Necrotizing fasciitis
 - Cellulitis with lymphedema
 - Gram-positive bacteremia
 - Pyelonephritis with a stent
 - C. difficile as the primary infection
 - Osteomyelitis
 - Febrile neutropenia
 - Meningitis

Potential Barriers

- Provider approval of pharmacist involvement to adjust antibiotic durations at discharge
- Establishing a consistent workflow among multiple pharmacists
- Establishing consistent documentation regarding adjustments made to discharge prescriptions

Discussion

Pharmacists involved in antimicrobial stewardship programs already assess appropriate durations of antimicrobial therapy as part of their daily workflow. Utilizing pharmacists to appropriately adjust the duration for pre-approved indications will impact patient care by minimizing unnecessary antibiotic exposure, reducing patient cost, and ensuring treatment is guideline-directed and evidence-based. The purpose of this project is to educate providers on appropriate durations of therapy, leverage pharmacists involved with transitions of care to review and evaluate discharge antibiotics, and to develop protocols to allow pharmacists to independently adjust durations of antibiotic therapy on discharge.

Author Disclosures

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation. Kyla Peters: nothing to disclose, Heidi Simons: nothing to disclose, Jada Cunningham: nothing to disclose, Channa Richardson: nothing to disclose, Martin St. John: nothing to disclose, Aimee Thornton: nothing to disclose.

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