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## Introduction

- Infection is a significant complication among those who receive left ventricular assist devices (LVADs) for severe heart failure.<sup>1</sup>
- Studies have shown that these infections are associated with higher mortality, with one study showing up to an increase by 5-6 fold.<sup>2,3</sup>
- The International Society for Heart and Lung Transplantation (ISHLT) notably updated recommendations in 2017 to narrow prophylaxis regimens to target *Staphylococcus* species based on current data.<sup>4,5</sup>
- In 2018, in accordance with the ISHLT guidelines, our institution established recommendations to use cefazolin, vancomycin, or both for LVAD surgical prophylaxis based on internal epidemiological data.
- Previously, antimicrobials were given at the discretion of the anesthesiologists, which resembled the broad-spectrum regimens used in the REMATCH trial.<sup>6</sup>

## Objective

To evaluate the rate of surgical site infections (SSI) and all-cause mortality in those who received narrow or broad antimicrobial prophylaxis as well as characterizing common organisms causing SSI in LVAD patients.

## Methods

**Study Design:** Single center, retrospective cohort study conducted at Baylor University Medical Center in Dallas, TX

**Time Frame:** January 1, 2015 – September 1, 2019

Patients were collected from the INTERMACS database. Patient data collected from the electronic medical record (Allscripts, Chicago, IL).

### Definitions of SSI:

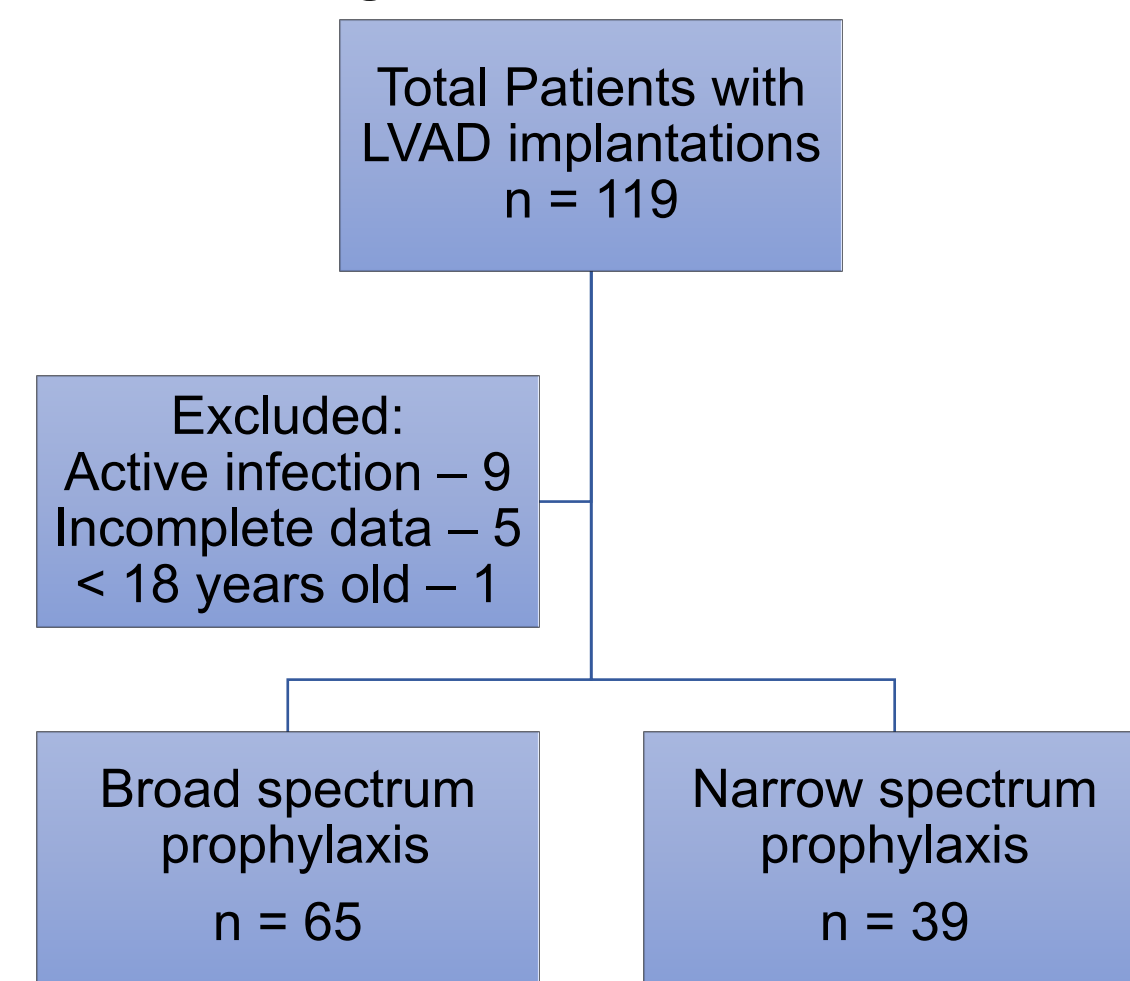
**National Healthcare Network (NHSN):** superficial incisional, deep incisional, or organ/space infections

**ISHLT:** VAD-specific, VAD-related, or Non-VAD infections

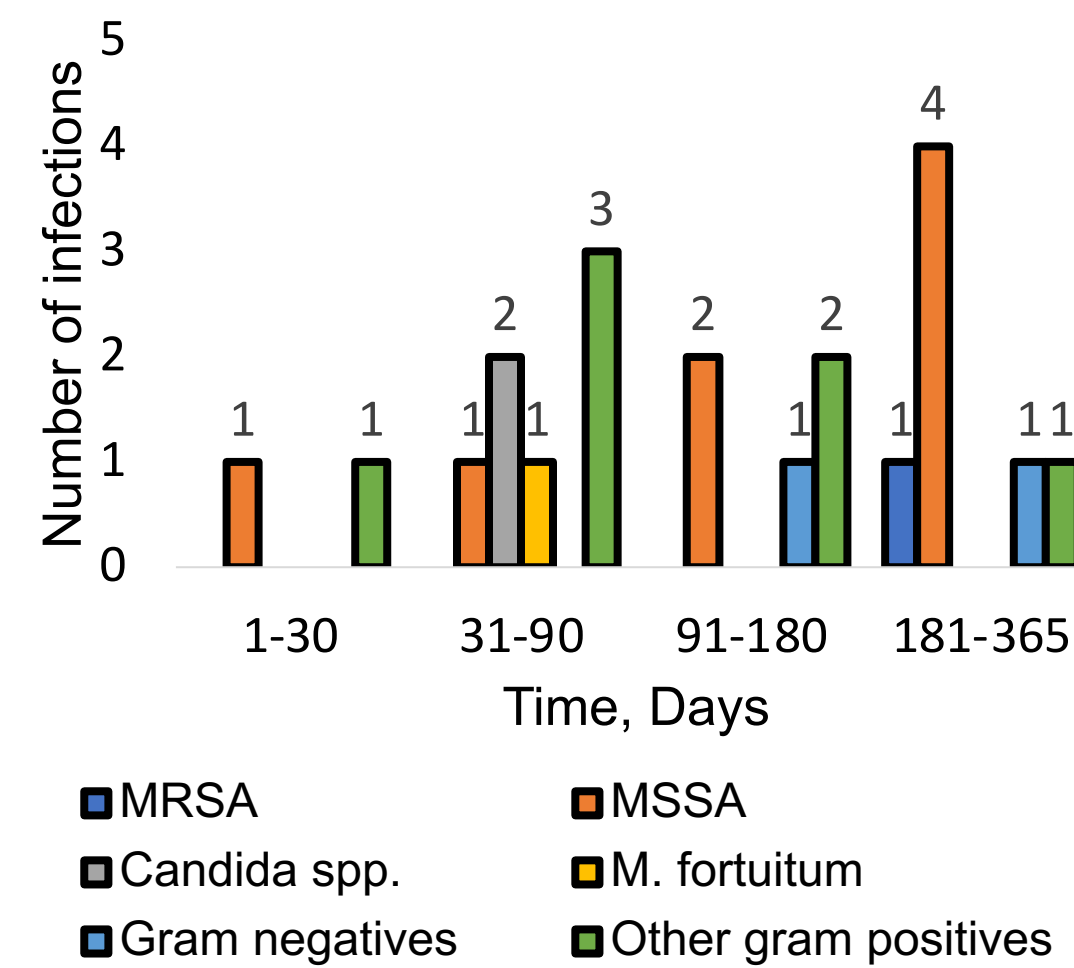
Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> <li>• Adult inpatients (≥18 years)</li> <li>• Patients with LVAD                             <ul style="list-style-type: none"> <li>• Heartmate™2 and 3</li> <li>• HeartWare™HVAD™</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No longer managed at BUMC</li> <li>• Treated for infection at time of implantation</li> <li>• Re-implantation within 90 day</li> <li>• Inadequate medical records to determine outcome</li> </ul>

## Results

**Figure 1: Enrollment**



**Figure 2: Organisms Isolated by Time**

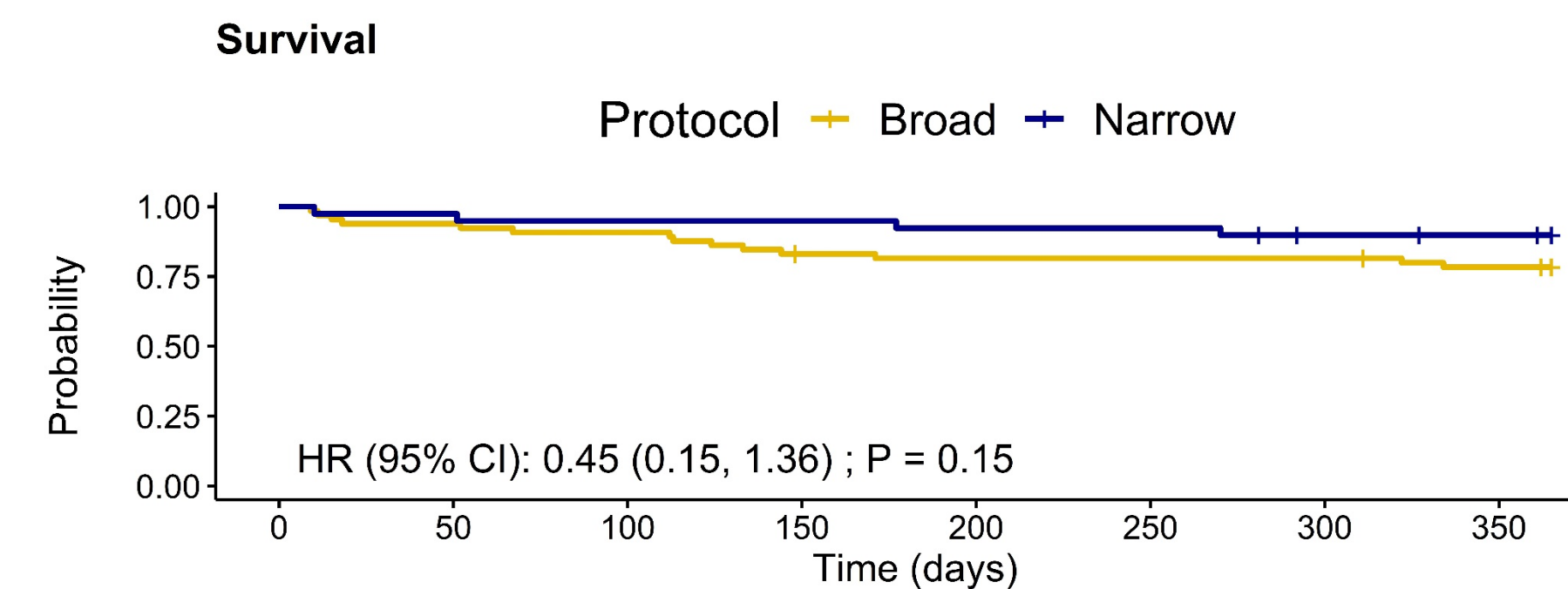


**Table 1: Baseline characteristics**

Variable*	Broad Spectrum (N = 65)	Narrow Spectrum (N = 39)	P-value
Age (years)	59 [53, 67]	57 [50, 65]	0.201
BMI (kg·m <sup>-2</sup> )	27.1 [23.7, 32.9]	27.0 [24.2, 32.8]	0.781
Sex, Male	55 (84.6%)	34 (87.2%)	0.942
Hemoglobin A1C	6.2 [5.6, 7.3]	6.5 [5.8, 7.2]	0.598
History of Diabetes	34 (52.3%)	16 (41%)	0.362
History of Renal Disease	34 (52.3%)	23 (59%)	0.647
INTERMACS Profile Score	3[2,3]	2[2,3]	0.547
Bridge to transplant	15 (23.1%)	11 (28.2%)	0.726
Device type:			0.002
Heartmate™2	48 (73.9%)	24 (61.5%)	
Heartmate™3	4 (6.2%)	12 (30.8%)	
HeartWare™HVAD™	13 (20%)	3 (7.7%)	
<b>Risk Factors</b>			
Vasopressors (days)	3 [3, 5]	3 [2, 5]	0.470
Inotropes (days)	7 [4, 10]	7 [5.5, 9.5]	0.825
Procedure duration (hours)	4.0 [3.6, 4.7]	4.0 [3.3, 4.9]	0.825
Central line (days)	9 [6, 14]	10 [6.5, 15.5]	0.898
Mech. ventilation (days)	1 [1, 2]	1 [1, 3]	0.793
Delayed sternal closure	2 (3.08%)	0 (0%)	0.527
LOS pre-implant (days)	7 [4, 11]	6 [3, 11.5]	0.220
Total LOS (days)	24 [18, 29]	21 [18, 27.5]	0.798
Allergy to prophylactic meds	8 (12.3%)	5 (12.8%)	1.000
Followed re-dosing guidelines	40 (61.5%)	21 (53.9%)	0.669

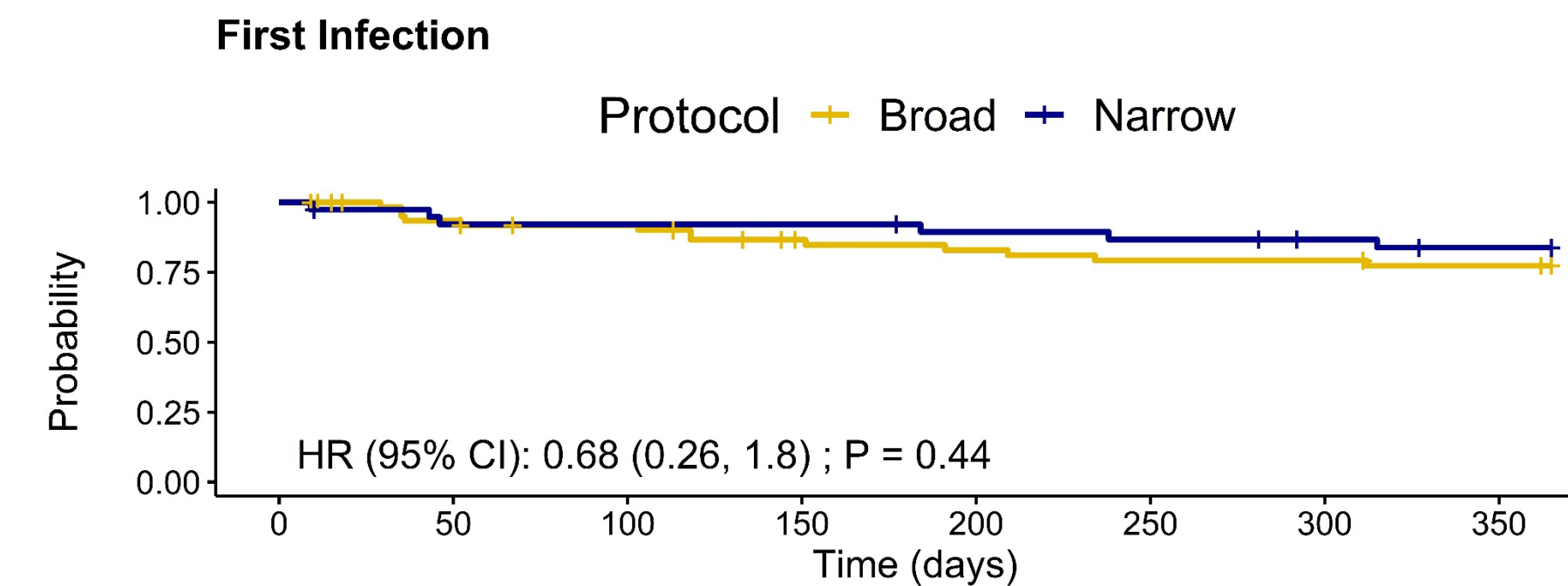
\*Interquartile range reported in brackets and percentages reported in parentheses

**Figure 3: Kaplan-Meier Curves**



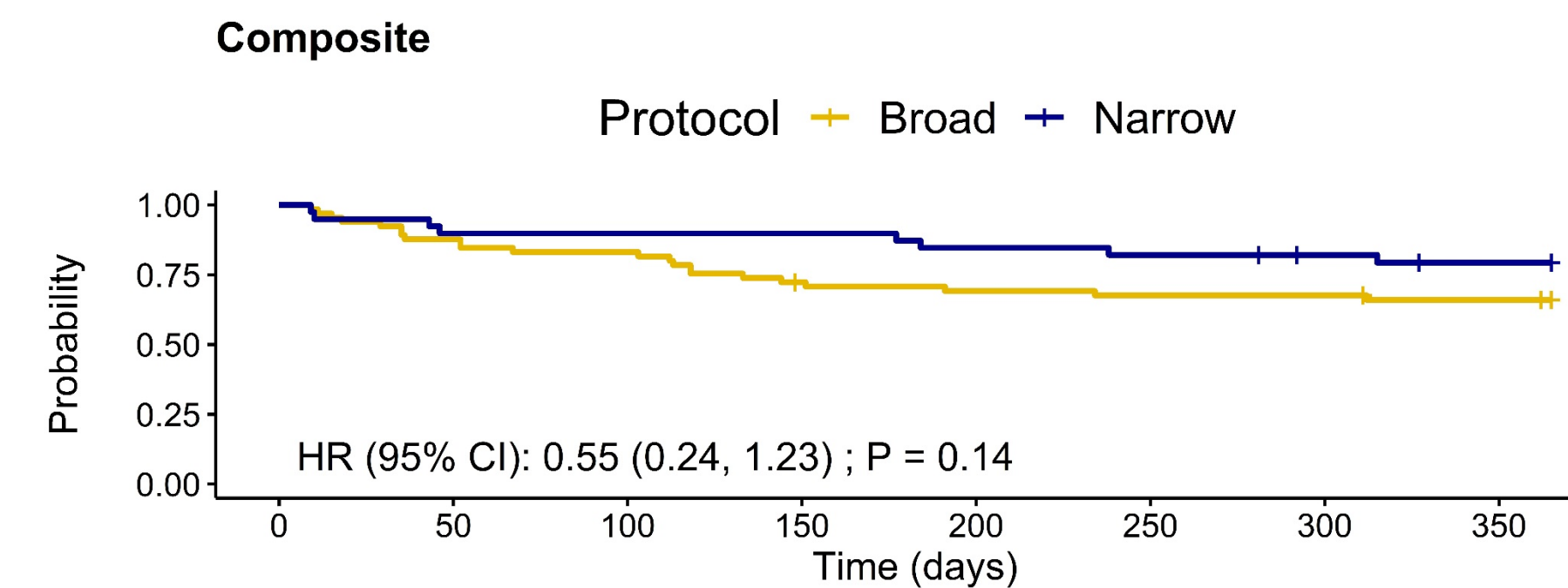
Number at risk

Time (days)	0	50	100	150	200	250	300	350
Broad	65	61	59	53	52	52	52	49
Narrow	39	38	37	37	36	36	33	32



Number at risk

Time (days)	0	50	100	150	200	250	300	350
Broad	65	57	54	47	45	43	43	41
Narrow	39	35	35	35	33	32	30	28



Number at risk

Time (days)	0	50	100	150	200	250	300	350
Broad	65	57	54	46	44	43	43	41
Narrow	39	35	35	35	33	32	30	28

## Discussion

- There were no differences in the rate of SSIs, time to mortality, or time to first infection between patients who received narrow and those who received broad antimicrobial prophylaxis.
- The majority of infections were caused by gram-positive organisms, most commonly methicillin-susceptible *Staphylococcus aureus*.
- There is limited data evaluating the appropriate regimen for prophylaxis in LVAD implantation.
- Aburjania and colleagues in 2018 conducted a similar study comparing a single-drug regimen to a broad spectrum regimen and also found no differences in rates of surgical site infections.<sup>7</sup>

### Strengths and Limitations

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|---|--|
| <ul style="list-style-type: none"> <li>• Moderate sample size</li> <li>• Detailed patient characteristics</li> <li>• Exclusion of re-implants and those with active infections at the time of implantation</li> <li>• 1<sup>st</sup> study to apply NHSN criteria</li> <li>• Provided data for Heartmate™3</li> </ul> | <ul style="list-style-type: none"> <li>• Retrospective</li> <li>• Did not account for surgical technique, scrub-in procedures, or physician prescribing preferences</li> <li>• Absence of documentation was recorded as the patient not meeting that variable</li> </ul> |
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## Conclusion

The rates of infection and all-cause mortality between patients who received narrow prophylaxis versus those who received broad prophylaxis were not different. This highlights an opportunity for institutions to narrow their surgical infection prophylaxis protocols to primarily cover gram-positive organisms.

## References

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## Disclosure

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:  
 All authors: nothing to disclose