

Effect of prior pneumonia and pneumonia hospitalizations on mobility in older adults: results from the Lifestyle Interventions and Independence for Elders (LIFE) Study

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Introduction

- Maintaining physical functioning and independence is a key component of healthy aging and is an independent predictor of morbidity and mortality¹
- Precipitating health events, such as pneumonia, may lead to changes in physical functioning in older adults²
- Prior studies have linked pneumonia to functional status, e.g. Activities of Daily Living,³ but not objectively measured physical functioning nor differentiated inpatient and outpatient episodes

Objective

- The objective of this study was to assess the impact of inpatient and outpatient pneumonia episodes on older adults' ability to walk 400-meters and gait speed.

Methods

- Data from the Lifestyle Interventions and Independence for Elders (LIFE) Study⁴ (NCT01072500) from the National Institute on Aging AgingResearchBiobank.
- 400-m walk tests were conducted by study staff at 6-month time periods. Inability to complete was determined "major mobility disability (MMD)." Gait speed (meters/second) was also recorded during this assessment.
- Health events (pneumonia) were assessed at each visit. Current pneumonia status was based on status since prior follow-up, prior pneumonia status was based on the prior assessment visit.
- Pneumonia was recorded as outpatient, inpatient, or none as a time-varying exposure. MMD was a binary outcome assessed in a mixed effect, repeated measures logistic regression with adjusted odds ratios (OR) reported. Gait speed was similarly analyzed as a continuous measure with adjusted percent change reported.

References

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With pneumonia occurring in the last 6 months, odds of not being able to walk 400-meters were 4x higher after inpatient and 2x higher after outpatient episodes among older adults.

Preventing pneumonia in older adults is important to maintain mobility and independence.

Results

	No Pneumonia (N=1461)		Pneumonia (N=174)		P-value
	N/mean	%/SD	N/mean	%/SD	
Demographics					
Age, years	78.84	5.18	79.22	5.65	0.367
Female	992	67.9%	114	65.5%	0.526
Race					0.146
Black	262	17.9%	21	12.1%	
Other	94	6.4%	13	7.5%	
White	1086	74.3%	138	79.3%	
Education ≥ high school	985	67.4%	121	69.5%	0.572
Smoking					0.379
Former	647	44.3%	86	49.4%	
Current	44	3.0%	6	3.4%	
Number of medications	4.84	3.09	5.86	3.49	<.001
Hospitalization (prior year)	109	7.5%	25	14.4%	0.002

Respiratory function was worse at baseline for those who developed pneumonia during f/u

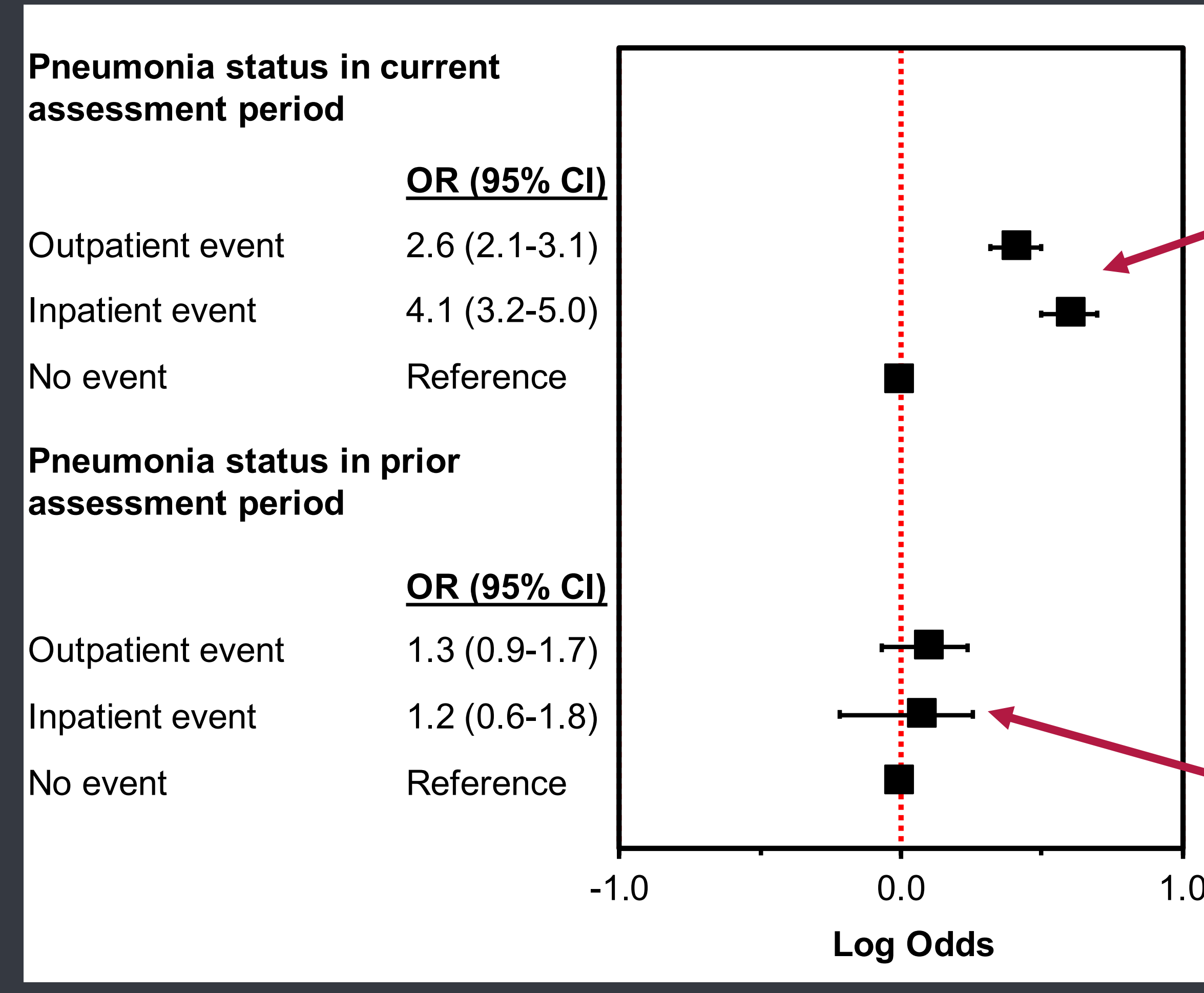
Other demographic, clinical history, and physical functioning metrics were similar

	No Pneumonia (N=1461)		Pneumonia (N=174)		P-value
	N/mean	%/SD	N/mean	%/SD	
Respiratory Disease and Functioning					
Pneumonia	479	32.8%	82	47.1%	<.001
Bronchitis	534	36.6%	77	44.3%	0.047
Cough	192	13.1%	37	21.3%	0.004
Phlegm	209	14.3%	29	16.7%	0.404
Chronic bronchitis	107	7.3%	22	12.6%	0.014
Emphysema	47	3.2%	12	6.9%	0.014
Asthma	202	13.8%	36	20.7%	0.015
Inhaler use	126	8.6%	33	19.0%	<.001
Forced Expiratory Volume after 1s (FEV1), L	1.9	0.6	1.8	0.6	0.015
Maximum inspiratory pressure	58.9	22.6	59.9	22.5	0.604
Physical functioning tests					
SPPB≤7	650	44.5%	90	51.7%	0.070
400 Meter Walk gait speed (M/sec)	0.82	0.17	0.8	0.16	0.141
Frailty index score	0.26	0.06	0.27	0.06	0.200

Abbreviations: SBBP=Short Physical Performance Battery, a measure of lower extremity strength and balance

Ability to walk 400-meters

Figure 1: Adjusted odds ratios (OR) and 95% confidence intervals (95% CI) for the association between current (1-day to 6-months before assessment) and prior (6 to 12-months before assessment) pneumonia events and major mobility disability.



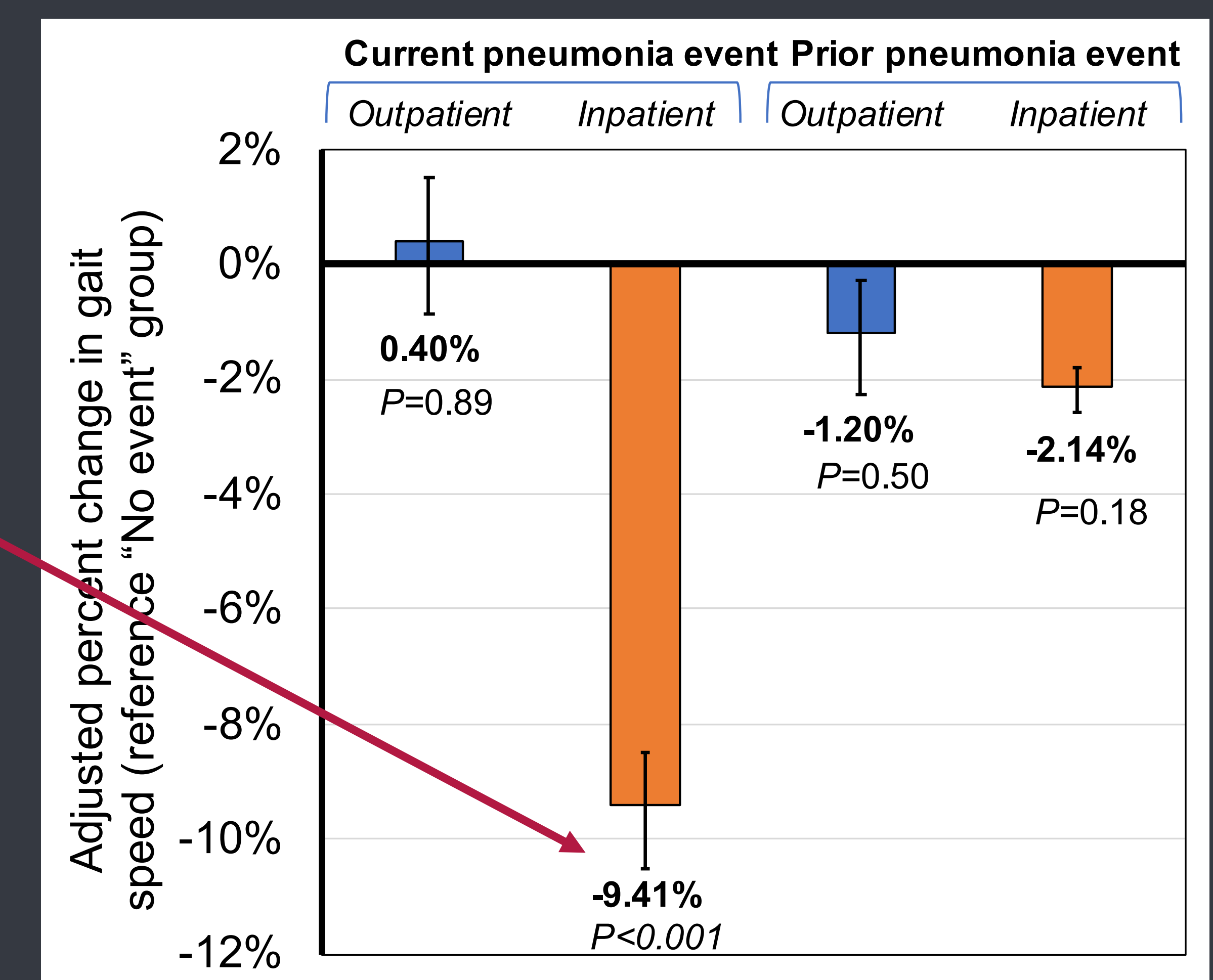
Acute effect of pneumonia episodes within the last 1-180 days

Only inpatient episodes were associated with a clinically significant change in gait speed

Effect of pneumonia disappeared after 6-12 months

Gait Speed (m/s) during assessment

Figure 2: Adjusted percent change in gait speed based on current (1-day to 6-months before assessment) and prior (6 to 12-months before assessment) pneumonia event status. Labels indicate the point estimate and the p-value for the comparison to the "No event" group.



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