

Opportunistic Infections During Adult CAR-T Hospitalizations in the United States: A National Inpatient Sample (NIS) Analysis, 2018–2022

FEIST-WEILLER CANCER CENTER

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Background

- Opportunistic infections (OIs) are recognized complications of chimeric antigen receptor T-cell (CAR-T) therapy.
- Published data are largely single-center or longitudinal cohorts; national admission-level estimates are limited.

Objective

To estimate the incidence, predictors, and inpatient impact of opportunistic infections during adult CAR-T hospitalizations in the United States.

Methods

- Design: retrospective cross-sectional study of the HCUP National Inpatient Sample, 2018–2022 (US inpatient hospitals).
- Adult CAR-T admissions identified using ICD-10-PCS procedure codes.
- OIs defined using ICD-10-CM codes for Pneumocystis jirovecii pneumonia, herpes simplex virus, cytomegalovirus, fungal infections, toxoplasmosis, nocardiosis, and zoster.
- Rare components with unweighted cell size ≤10 were aggregated or suppressed.
- Survey-weighted analyses incorporated strata, cluster, and discharge weights.
- Multivariable logistic and linear regression evaluated OI predictors and associations with inpatient mortality, length of stay, and total charges.
- De-identified administrative data were used; informed consent was not applicable.

Limitations

- Administrative coding cannot confirm severity, laboratory values, or treatment intent.
- The NIS counts admissions, not unique patients; no outpatient or post-discharge follow-up.
- Product type, lymphodepletion, and prophylaxis regimens are not captured.

Findings

12,980

Weighted CAR-T admissions (2,596 unweighted)

5.4%

Strict OI incidence (broad definition, 10.8%)

1,425 → 4,475

Weighted CAR-T admissions, 2018 to 2022

3.50

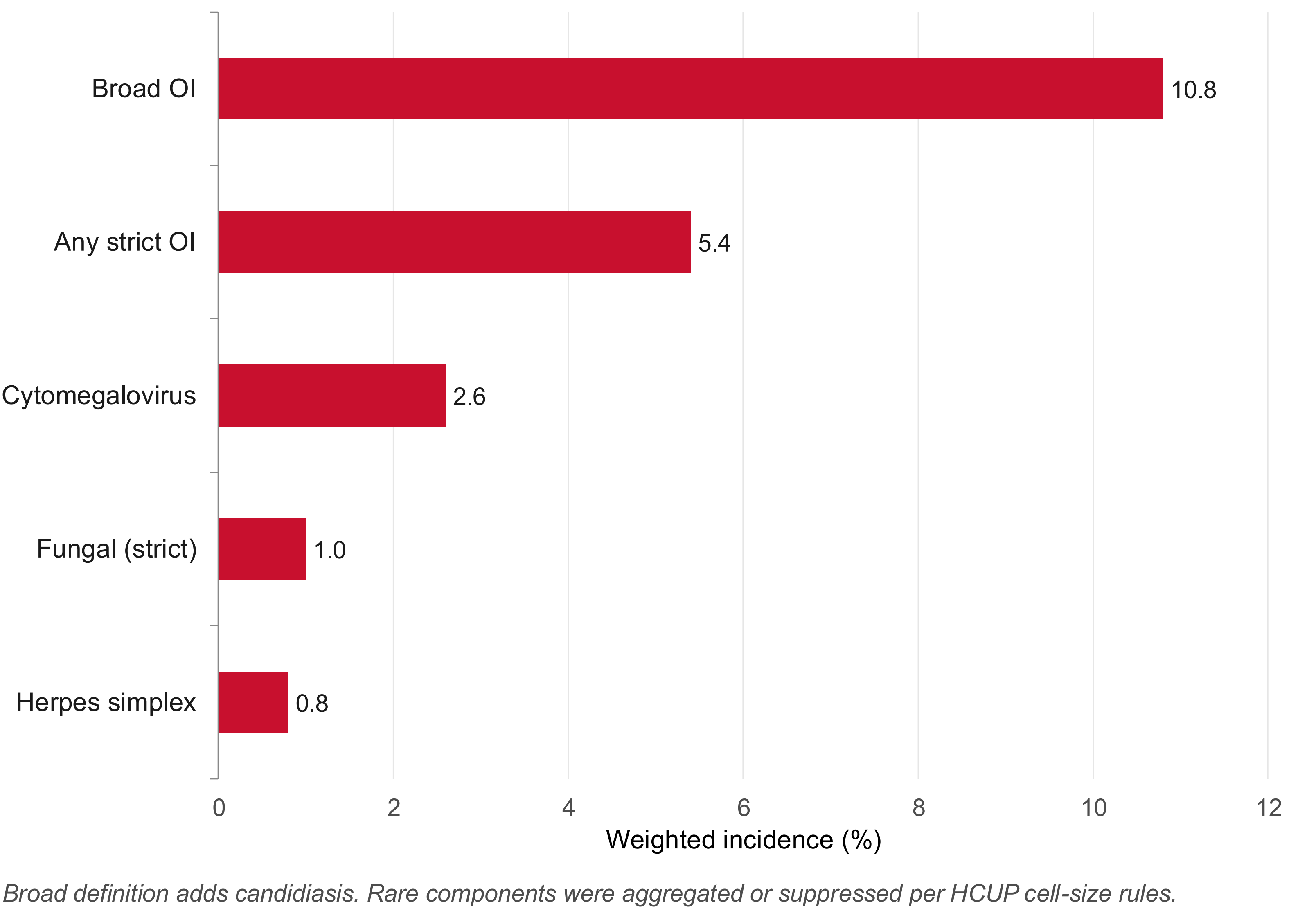
Adjusted odds of in-hospital mortality with OI

Outcomes

Outcome	OI	No OI
In-hospital mortality	8.7%	2.9%
Length of stay, days	32.4	16.9
Total charges	\$1.57M	\$1.15M

Strict OI definition. Linear time trend in strict OI incidence was not significant (OR per year 0.94; P=.259).

Figure



Adjusted

Variable	Estimate (95% CI)
Hispanic	OR 2.01 (1.17–3.45)
Other/Asian/Native	OR 2.25 (1.31–3.89)
Medicaid payer	OR 2.49 (1.22–5.09)
Mortality with OI	aOR 3.50 (1.76–6.98)
Length of stay	+15.5 d (11.1–20.0)
Total charges	+\$457,196

Charges +\$457,196 (95% CI \$268,552–\$645,840).

Conclusions

Opportunistic infections complicate a meaningful minority of adult CAR-T hospitalizations and are associated with substantially higher inpatient mortality and resource utilization. Observed differences by race/ethnicity and payer warrant validation in longitudinal post-CAR-T datasets.