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Incidence, Mortality, and Cost Trends in Non-Ventilator Hospital-Acquired Pneumonia in Medicaid Beneficiaries, 2015-2019

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Nonventilator Hospital-Acquired Pneumonia (NVHAP)

What is the Impact of NVHAP?

- Hospital-acquired pneumonia is the most deadly and costly of all the hospital acquired infections - 1 in every 4 hospital acquired infections is pneumonia – Majority are NVHAP (60%)
NVHAP is found on ALL hospital units – **mostly outside the ICU**
- NVHAP is now **the most common hospital-acquired infection (HAI)**
- Antibiotic stewardship: Most common antibiotics starts are associated with respiratory/pneumonia
- Associated mortality=13-30.9%
- 8.4 X more likely to die than equally sick patients who do not get pneumonia
- Less likely to go home after NVHAP = Long term care (25%)
- Associated with 30-day readmissions (19%) and increased ICU utilization (46%)
- Respiratory infection/pneumonia: most common cause of sepsis



Photo: Taken by critical care nurse and photojournalist Alan Hawes, RN

Objective

The objective was to examine the incidence, mortality, and health care costs associated with NVHAP in Medicaid beneficiaries across the 5-year period of 2015-2019.

Methods

- This cross-sectional study included all Medicaid beneficiaries in the IBM Watson MarketScan Medicaid Database diagnosed with NVHAP during an inpatient hospital admission during the years 2015-2019.
- The primary outcome variable was diagnosis of NVHAP during an inpatient hospital stay, defined as pneumonia unassociated with mechanical ventilation according to the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM).

Results

- Of the 5,668,417 Medicaid beneficiaries included in the 2015-2019 dataset, 75,909 were diagnosed with NVHAP, for an overall rate of 1.34%
- Incidence expressed as rate per 1000 patient days of 2.63
- Overall mortality of 7.76%.
- While overall costs were relatively flat, in examining costs incurred after NVHAP diagnosis, there were increases in:
 - total costs (6.6%)
 - costs as a percentage of total NVHAP encounter costs (22.4%)
 - costs as a percentage of total inpatient costs (12.7%)

	Non-NVHAP	NVHAP	Overall NVHAP rate	Overall NVHAP Rate per 1000 Patient Days	Total NVHAP Deaths	Overall NVHAP Mortality
Total	5,592,508	75,909	1.34%	2.63	5887	7.76%
Age in years			NVHAP rates	Rate per 1000 Patient Days	NVHAP Mortality (N/%) by Group	NVHAP Mortality Rate by Group
0-17	1,842,172 32.94%	6,461 8.51%	0.35%	0.71	230 (3.7%)	3.56%
18-44	2,039,318 36.47%	15,788 20.80%	0.77%	1.87	883 (17%)	5.59%
45-64	1,047,483 18.73%	34,165 45.01%	3.16%	5.18	2943 (50.3%)	8.64%
65+	673,535 12.04%	19,495 25.68%	2.81%	4.47	1831 (29%)	9.39%
Sex						
Male	1,971,500 35.17%	36,729 48.39%	1.83%	3.1	3123 (52.7%)	8.50%
Female	3,625,521 0.65	39,178 51.61%	1.07%	2.32	2764 (47.3)	7.05%
Race						
White	2,710,785 48.42%	41,114 54.16%	1.49%	2.99	3098 (52.1%)	7.54%
Black	1,615,298 28.86%	22,023 29.01%	1.35%	2.59	1833 (32.1%)	8.32%
Hispanic	227,054 4.06%	1,425 1.88%	62.00%	1.60	126 (2.4%)	8.84%
Other	1,044,796 18.66%	11,347 14.95%	1.07%	2.07	830 (13.5%)	7.31%

NVHAP Rates and Mortality in Total and by Age, Sex and Race

Conclusion

- For Medicaid beneficiaries between 2015 and 2019, these findings provide additional support to previous research on the harm and cost associated with NVHAP.
- While Congress and the Centers for Medicare and Medicaid Services (CMS) have acted to reduce rates of some hospital acquired infections (HAI) through the Hospital Acquired Condition Reduction Program (HACRP), NVHAP is not currently included.
- The time is right to include NVHAP as an HACRP HAI initiative.