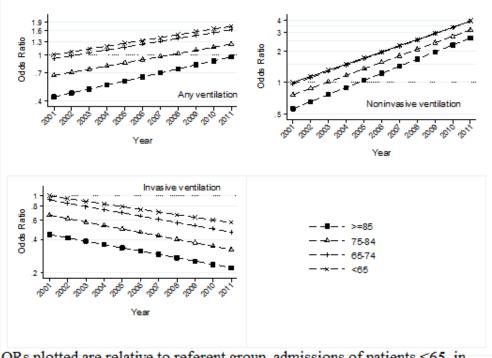


Trends in Mechanical Ventilation Among Patients Hospitalized With Acute Exacerbations of COPD in the United States, 2001 to 2011

Mihaela S. Stefan, MD; Meng-Shiou Shieh, PhD; Penelope S. Pekow, PhD; Nicholas Hill, MD, FCCP; Michael B. Rothberg, MD, MPH; and Peter K. Lindenauer, MD

CHEST 2015; 147(4):959-968

e-Figure 1.

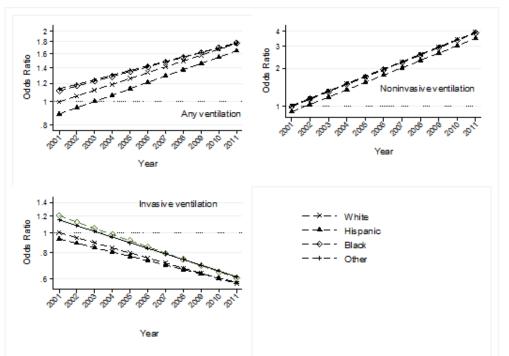


A: Trends of ventilation use in COPD by age groups, 2001-2011

ORs plotted are relative to referent group, admissions of patients <65, in 2001



e-Figure 2.



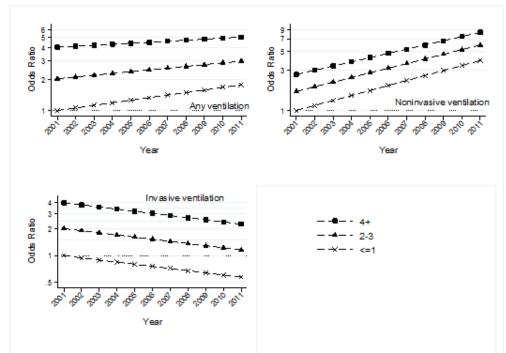
B: Trends of ventilation use in COPD by race groups, 2001-2011

ORs plotted are relative to referent group, admissions of white patients, in 2001



e-Figure 3.

C: Trends of ventilation use in COPD by comorbidity score, 2001-2011 \cdot

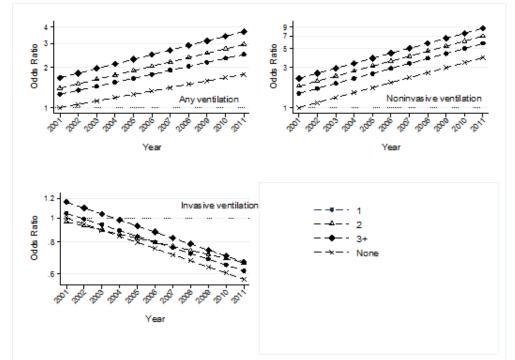


ORs plotted are relative to referent group, admissions of patients with low comorbidity score, in 2001



e-Figure 4.

D: Trends of ventilation use in COPD by prior number of COPD admissions, 2001-2011



ORs plotted are relative to referent group, admissions of patients without prior hospitalization for COPD, in 2001

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e-Table 1: Patient Characteristics and Ventilation Management Over Time

Gender Female 58.20% 58.20% 59.10% 59.40% 59.80% 59.70% 59.80% 59.70% 60.20% 60.20% 60.30% 60.30% Male 41.80% 41.80% 40.90% 40.60% 40.20% 40.30% 40.30% 39.80% 39.70% 30.70% 30.70% 31.0% 31.0% 31.0% 31.0% 31.0% 31.0% 31.0% 31.0% 31.0% 31.0% 32.60% 28.60% 28.60% 28.60% 28.40% 28.70% 25.60% 25.30% 25.60% 25.60% 25.60% 25.60% 25.60	CHARACTERISTIC or VENTILATION MANAGEMENT							YEAR					
Gender Female 58.20% 58.20% 59.10% 59.40% 59.80% 59.70% 59.80% 59.70% 60.20% 60.20% 60.30% 60.30% Male 41.80% 41.80% 40.90% 40.60% 40.20% 40.30% 40.30% 39.80% 39.70% 30.70% 30.70% 31.0% 31.0% 31.0% 31.0% 31.0% 31.0% 31.0% 31.0% 31.0% 31.0% 32.60% 28.60% 28.60% 28.60% 28.40% 28.70% 25.60% 25.30% 25.60% 25.60% 25.60% 25.60% 25.60			2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Male41.80%41.80%40.90%40.60%40.20%40.30%40.20%40.30%39.80%39.70%39.70%Median, IQR71,62-7871,61-7871,61-7871,61-7871,61-7971,61-7971,61-7970,60-7970,60-7970,60-7970,60-7970,60-7970,61-79<65	Total COPD Admissions		43,421	51,173	59,249	56,689	64,295	71,057	73,016	86,039	86,345	83,161	49,115
Male 41.80% 41.80% 40.90% 40.60% 40.20% 40.30% 40.30% 39.80% 39.70% 39.70% Median, IQR 71,62-78 71,61-78 71,61-78 71,62-79 71,61-79 71,61-79 70,60-79 70,60-79 70,60-79 70,61-79 <65	Gender	Female	58.20%	58.20%	59.10%	59.40%	59.80%	59.70%	59.80%	59.70%	60.20%	60.30%	60.30%
<65		Male	41.80%	41.80%	40.90%	40.60%	40.20%	40.30%	40.20%	40.30%	39.80%	39.70%	39.70%
Age (years) 65-74 32.00% 31.00% 30.20% 29.80% 29.20% 28.50% 28.60% 28.10% 28.50% 28.40% 28.70% 75-84 27.90% 28.40% 28.50% 28.60% 28.40% 27.90% 25.60% 25.30% 25.60% 25.60% 25.60% 25.60% 25.60% 25.60% 25.60% 11.20% 11.20% 11.20% 11.20% 11.50% 11.50% 75.80%	Age (years)	Median, IQR	71,62-78	71,61-78	71,61-78	71,61-78	71,62-79	71,61-79	71,61-79	71,61-79	70,60-79	70,60-79	70,61-79
75-84 27.90% 28.40% 28.50% 28.60% 28.40% 27.90% 27.60% 25.60% 25.30% 25.60% ≥85 8.10% 8.00% 8.40% 9.00% 9.60% 10.10% 10.30% 11.20% 11.20% 11.20% 11.50% White 76.70% 73.20% 74.00% 73.20% 72.80% 71.50% 70.90% 70.80% 70.60% 71.80% 75.80%		<65	32.00%	32.60%	32.90%	32.50%	32.60%	33.10%	33.20%	33.10%	35.30%	35.10%	34.30%
≥85 8.10% 8.00% 8.40% 9.00% 9.60% 10.10% 10.30% 11.20% 10.60% 11.20% 11.20% 11.20% 11.20% 11.20% 11.20% 11.20% 11.20% 11.20% 11.20% 11.20% 11.20% 11.20% 11.50% 75.80% 71.50% 70.90% 70.80% 70.60% 71.80% 75.80%		65-74	32.00%	31.00%	30.20%	29.80%	29.20%	28.50%	28.60%	28.10%	28.50%	28.40%	28.70%
White 76.70% 73.20% 74.00% 73.20% 72.80% 71.50% 70.90% 70.80% 70.60% 71.80% 75.80%		75-84	27.90%	28.40%	28.50%	28.60%	28.60%	28.40%	27.90%	27.60%	25.60%	25.30%	25.60%
		≥85	8.10%	8.00%	8.40%	9.00%	9.60%	10.10%	10.30%	11.20%	10.60%	11.20%	11.50%
	Race/Ethnicity	White	76.70%	73.20%	74.00%	73.20%	72.80%	71.50%	70.90%	70.80%	70.60%	71.80%	75.80%
Black 7.60% 8.80% 9.60% 10.50% 10.30% 10.50% 10.80% 10.60% 11.00% 10.50% 10.30%		Black	7.60%	8.80%	9.60%	10.50%	10.30%	10.50%	10.80%	10.60%	11.00%	10.50%	10.30%
Hispanic 2.20% 3.80% 4.60% 3.20% 3.40% 3.50% 3.60% 4.10% 4.20% 3.80% 2.20%		Hispanic	2.20%	3.80%	4.60%	3.20%	3.40%	3.50%	3.60%	4.10%	4.20%	3.80%	2.20%
Other 13.60% 14.20% 11.90% 13.10% 13.60% 14.40% 14.80% 14.60% 14.20% 13.90% 11.70%		Other	13.60%	14.20%	11.90%	13.10%	13.60%	14.40%	14.80%	14.60%	14.20%	13.90%	11.70%
Median, IQR 2,1-3 2,1-3 2,1-3 2,1-3 2,1-3 2,1-3 2,1-4 2,1-4 2,1-4 2,1-4 2,1-4	Combined Comorbidity Score	Median, IQR	2,1-3	2,1-3	2,1-3	2,1-3	2,1-3	2,1-3	2,1-4	2,1-4	2,1-4	2,1-4	2,1-4
		Low (≤1)	48.40%	47.80%	47.70%	46.40%	45.60%	43.10%	41.80%	40.50%	40.40%	39.50%	39.50%
Score Median (2-3) 33.70% 33.00% 33.10% 32.70% 32.20% 31.90% 32.00% 31.60% 31.50% 31.70%		Median (2-3)	33.70%	33.00%	33.30%	33.10%	32.70%	32.20%	31.90%	32.00%	31.60%	31.50%	31.70%
High (≥4) 17.90% 19.20% 19.00% 20.50% 21.70% 24.80% 26.30% 27.40% 28.00% 29.00% 28.90%		High (≥4)	17.90%	19.20%	19.00%	20.50%	21.70%	24.80%	26.30%	27.40%	28.00%	29.00%	28.90%
History of Concomitant Pneumonia 9.20% 10.50% 12.90% 13.90% 15.30% 15.60% 17.50% 23.50% 22.80% 21.90% 23.80%	History of Concomitant Pneumonia		9.20%	10.50%	12.90%	13.90%	15.30%	15.60%	17.50%	23.50%	22.80%	21.90%	23.80%
None 70.50% 70.40% 70.50% 68.40% 69.70% 69.50% 68.00% 68.20% 66.80% 66.70% 70.00%	Number of COPD Admissions in Prior Year	None	70.50%	70.40%	70.50%	68.40%	69.70%	69.50%	68.00%	68.20%	66.80%	66.70%	70.00%
Number of COPD 1 16.80% 17.00% 16.60% 17.00% 16.90% 17.40% 17.60% 17.80% 17.00%		1	16.80%	17.00%	16.80%	17.60%	17.00%	16.90%	17.40%	17.60%	17.80%	17.80%	17.00%
Admissions in Prior Year 2 6.40% 6.40% 6.60% 6.60% 6.60% 6.60% 6.60% 6.90% 6.80% 7.20% 7.20% 6.30%		2	6.40%	6.40%	6.60%	6.80%	6.60%	6.60%	6.90%	6.80%	7.20%	7.20%	6.30%
≥3 6.20% 6.20% 6.20% 7.20% 6.70% 6.90% 7.70% 7.50% 8.10% 8.30% 6.80%		≥3	6.20%	6.20%	6.20%	7.20%	6.70%	6.90%	7.70%	7.50%	8.10%	8.30%	6.80%
Hospital Characteristics	Hospital Characteristics												
Small (<200) 18.30% 19.20% 18.70% 16.00% 17.70% 17.30% 17.90% 18.80% 19.90% 20.30% 23.40%	Bed Size	Small (<200)	18.30%	19.20%	18.70%	16.00%	17.70%	17.30%	17.90%	18.80%	19.90%	20.30%	23.40%
Bed Size Medium (200-400) 41.50% 41.50% 41.80% 41.30% 40.80% 41.30% 42.00% 42.20% 41.90%		Medium (200-400)	41.50%	42.30%	41.50%	41.80%	41.30%	41.30%	40.80%	41.30%	42.00%	42.20%	41.90%
Large (>400) 40.20% 38.50% 39.90% 42.20% 40.90% 41.40% 41.30% 39.90% 38.00% 37.60% 34.70%		Large (>400)	40.20%	38.50%	39.90%	42.20%	40.90%	41.40%	41.30%	39.90%	38.00%	37.60%	34.70%
Midwest 20.90% 20.60% 17.80% 19.20% 20.50% 20.20% 20.20% 20.40% 19.70% 19.70% 20.20%	Region	Midwest	20.90%	20.60%	17.80%	19.20%	20.50%	20.20%	20.20%	20.40%	19.70%	19.70%	20.20%
Region Northeast 9.30% 10.10% 17.30% 19.80% 20.40% 19.70% 19.90% 20.40% 19.70% 19.00% 17.90%		Northeast	9.30%	10.10%	17.30%	19.80%	20.40%	19.70%	19.90%	20.40%	19.70%	19.00%	17.90%
South 57.90% 57.30% 55.20% 51.30% 48.80% 46.30% 45.80% 45.80% 45.80% 46.70% 48.00%		South	57.90%	57.30%	55.20%	51.30%	48.80%	46.30%	45.80%	45.70%	45.80%	46.70%	48.00%
West 11.80% 12.00% 9.80% 9.70% 10.30% 13.80% 14.10% 13.40% 14.70% 14.60% 13.90%		West	11.80%	12.00%	9.80%	9.70%	10.30%	13.80%	14.10%	13.40%	14.70%	14.60%	13.90%

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Sector Online Supplement

Population Served	Rural	21.90%	19.60%	17.50%	15.00%	15.80%	15.30%	14.60%	14.90%	15.00%	16.30%	18.40%
	Urban	78.10%	80.40%	82.50%	85.00%	84.20%	84.70%	85.40%	85.10%	85.00%	83.70%	81.60%
Teaching Hospital		29.60%	30.30%	32.40%	33.90%	32.70%	31.90%	30.80%	31.20%	32.00%	32.00%	31.60%
Nature of Ventilation	No Ventilation	86.47%	85.30%	84.69%	83.12%	82.65%	81.35%	80.72%	81.09%	81.00%	80.04%	79.98%
	NIV Initially	5.46%	6.27%	7.26%	8.59%	9.52%	10.73%	11.75%	12.13%	12.48%	13.86%	14.21%
	IMV Initially	8.07%	8.44%	8.06%	8.29%	7.83%	7.92%	7.52%	6.78%	6.52%	6.11%	5.80%
	Any Ventilation	13.53%	14.70%	15.31%	16.88%	17.35%	18.65%	19.28%	18.91%	19.00%	19.96%	20.02%
Death		3.90%	3.90%	3.50%	3.50%	3.10%	3.10%	2.80%	2.60%	2.20%	2.00%	2.20%