

## Supplementary Online Content

Goodwin JS, Salameh H, Zhou J, Singh S, Kuo Y-F, Nattinger AB. Association of hospitalist years of experience with mortality in the hospitalized medicare population. *JAMA Intern Med*. Published online December 26, 2017. doi:10.1001/jamainternmed.2017.7049

**eTable 1.** Association of patient and hospital characteristics with the year of experience of hospitalists for all hospitalizations cared for by 3,860 physicians during their first four years working as hospitalists.

**eTable 2.** Mortality in the 30 days after admission, and hospital mortality, as a function of the number of years of experience of 2,027 hospitalists who practiced in the same hospital for four years, adjusted for patient and hospital characteristics, in a three level model.

**eTable 3.** Mortality in the 30 days after admission, and hospital mortality, as a function of the number of years of experience of the 2,026 hospitalists who practiced in the same hospital over their first four years, adjusted for patient and hospital characteristics, and limited to patients with a medial DRG.

This supplementary material has been provided by the authors to give readers additional information about their work.

**Online eTable 1.** Association of patient and hospital characteristics with the year of experience of hospitalists for all hospitalizations cared for by 3,860 physicians during their first four years working as hospitalists.

	All N (%) or Mean (SD)	Hospitalist experience				p-value
		First N=18,364	Second N=22,260	Third N=22,400	Fourth N=20,807	
Age	80.51 (7.96)	80.31 (7.88)	80.56 (7.92)	80.55 (7.96)	80.57 (8.07)	0.0030
Gender						0.0241
Male	29,770 (35.51%)	6,617 (36.03%)	7,741 (34.78%)	7,929 (35.40%)	7,483 (35.96%)	
Female	54,061 (64.49%)	11,747 (63.97%)	14,519 (65.22%)	14,471 (64.60%)	13,324 (64.04%)	
Medicaid eligible						0.2527
No	65,096 (77.65%)	14,337 (78.07%)	17,217 (77.35%)	17,346 (77.44%)	16,196 (77.84%)	
Yes	18,735 (22.35%)	4,027 (21.93%)	5,043 (22.65%)	5,054 (22.56%)	4,611 (22.16%)	
Length of stay in hospitalization	5.83 (4.02)	5.99 (4.29)	5.87 (4.22)	5.77 (3.84)	5.71 (3.75)	<0.0001
Number of hospitalizations in 12 months before admission	1.25 (1.73)	1.26 (1.74)	1.28 (1.76)	1.25 (1.73)	1.21 (1.71)	0.0001
DRG weight	1.58 (1.18)	1.57 (1.20)	1.58 (1.18)	1.57 (1.16)	1.59 (1.19)	0.1673
Number of comorbidities	4.79 (3.42)	4.45 (3.16)	4.72 (3.32)	4.90 (3.50)	5.05 (3.62)	<0.0001
Race						0.0028
White	71,803 (85.65%)	15,877 (86.46%)	19,032 (85.50%)	19,131 (85.41%)	17,763 (85.37%)	
Black	7,050 (8.41%)	1,465 (7.98%)	1,859 (8.35%)	1,963 (8.76%)	1,763 (8.47%)	
Hispanic	3,173 (3.78%)	670 (3.65%)	898 (4.03%)	798 (3.56%)	807 (3.88%)	
Other	1,805 (2.15%)	352 (1.92%)	471 (2.12%)	508 (2.27%)	474 (2.28%)	
Education (Percent of persons in zip code 25+ years with high school education or higher)	86.37 (8.55)	86.28 (8.63)	86.25 (8.59)	86.49 (8.44)	86.46 (8.57)	0.0034
DRG type						0.1308
Medical	66,203 (78.97%)	14,528 (79.11%)	17,458 (78.43%)	17,757 (79.27%)	16,460 (79.11%)	
Surgical	17,628 (21.03%)	3,836 (20.89%)	4,802 (21.57%)	4,643 (20.73%)	4,347 (20.89%)	
Residence prior to hospitalization						<0.0001
Community	75,151 (89.65%)	16,588 (90.33%)	20,015 (89.91%)	19,887 (88.78%)	18,661 (89.69%)	
Nursing facility and other institutions	8,680 (10.35%)	1,776 (9.67%)	2,245 (10.09%)	2,513 (11.22%)	2,146 (10.31%)	
Bed Size						0.0129
> 500	21,189 (25.28%)	4,726 (25.74%)	5,581 (25.07%)	5,657 (25.25%)	5,225 (25.11%)	

350 <, <= 500	15,343 (18.30%)	3,268 (17.80%)	4,005 (17.99%)	4,239 (18.92%)	3,831 (18.41%)	
200 <, <= 350	24,536 (29.27%)	5,312 (28.93%)	6,511 (29.25%)	6,501 (29.02%)	6,212 (29.86%)	
<= 200	22,763 (27.15%)	5,058 (27.54%)	6,163 (27.69%)	6,003 (26.80%)	5,539 (26.62%)	
Urban/Rural Indicator						0.3596
Rural	12,739 (15.20%)	2,724 (14.83%)	3,367 (15.13%)	3,439 (15.35%)	3,209 (15.42%)	
Urban	71,092 (84.80%)	15,640 (85.17%)	18,893 (84.87%)	18,961 (84.65%)	17,598 (84.58%)	
Type of provider						<0.0001
For profit	11,849 (14.13%)	2,409 (13.12%)	3,191 (14.34%)	3,258 (14.54%)	2,991 (14.37%)	
Government	9,714 (11.59%)	2,020 (11.00%)	2,535 (11.39%)	2,636 (11.77%)	2,523 (12.13%)	
Nonprofit	62,268 (74.28%)	13,935 (75.88%)	16,534 (74.28%)	16,506 (73.69%)	15,293 (73.50%)	
Medical School Affiliation						<0.0001
Major	16,213 (19.34%)	3,731 (20.32%)	4,278 (19.22%)	4,330 (19.33%)	3,874 (18.62%)	
Limited	15,211 (18.14%)	3,281 (17.87%)	4,089 (18.37%)	4,025 (17.97%)	3,816 (18.34%)	
Graduate	4,922 (5.87%)	1,203 (6.55%)	1,307 (5.87%)	1,244 (5.55%)	1,168 (5.61%)	
No affiliation	47,485 (56.64%)	10,149 (55.27%)	12,586 (56.54%)	12,801 (57.15%)	11,949 (57.43%)	

Abbreviations: SD, standard; DRG, Diagnosis-Related Group.

**Online eTable 2.** Mortality in the 30 days after admission, and hospital mortality, as a function of the number of years of experience of 2,027 hospitalists who practiced in the same hospital for four years, adjusted for patient and hospital characteristics, in a three level model. .

Characteristics	N (%) or Mean (SD)	30 day mortality rate post hospital admission		Hospital mortality rate	
		Observed rate	Odds Ratio <sup>a</sup> (95% CI)	Observed rate	Odds Ratio <sup>a</sup> (95% CI)
All	42,868	10.18%		3.15%	
Age (Per year)	80.5 (7.98)	10.18%	1.05 (1.05-1.06)	3.15%	1.03 (1.02-1.04)
Gender					
Female	27,629 (64.45%)	9.50%	Reference	2.84%	Reference
Male	15,239 (35.55%)	11.42%	1.21 (1.12 -1.30)	3.70%	1.17 (1.03-1.32)
Medicaid eligible					
No	33,358 (77.82%)	10.16%	Reference	3.16%	Reference
Yes	9,510 (22.18%)	10.26%	0.99 (0.91-1.09)	3.12%	0.92 (0.80-1.07)
Education (Percent of persons in zip code 25+ years with high school education or higher) (Per percent)	86.5 (8.34)	10.18%	0.99 (0.99-1.01)	3.15%	0.99 (0.98-0.99)
Number of hospitalizations in 12 months before admission (Per hospitalization)	1.3 (1.71)	10.18%	0.96 (0.93-0.99)	3.15%	0.95 (0.91-0.99)
Race					
White	36,982 (86.27%)	10.33%	Reference	3.17%	Reference
Black	3,595 (8.39%)	9.35%	0.87 (0.77-0.99)	3.09%	0.96 (0.77-1.19)
Hispanic	1,347 (3.14%)	8.31%	0.85 (0.68-1.06)	2.67%	0.86 (0.60-1.25)
Other	944 (2.20%)	10.17%	1.01 (0.80-1.26)	3.28%	1.02 (0.70-1.48)
DRG type					
Medical	33,996 (79.30%)	11.45%	Reference	3.40%	Reference
Surgical	8,872 (20.70%)	5.31%	0.72 (0.64-0.81)	2.19%	1.16 (0.97-1.40)
Residence prior to hospitalization					
Community	38,441 (89.67%)	9.51%	Reference	2.89%	Reference
Nursing facility and other institutions	4,427 (10.33%)	16.02%	1.67 (1.52-1.84)	5.42%	1.69 (1.45-1.97)
Bed Size					

> 500	11,471 (26.76%)	9.84%	Reference	3.29%	Reference
350 <, <= 500	8,351 (19.48%)	10.26%	1.03 (0.92-1.16)	3.22%	0.95 (0.78-1.15)
200 <, <= 350	12,572 (29.33%)	10.08%	0.99 (0.89-1.11)	3.17%	0.94 (0.78-1.13)
<= 200	10,474 (24.43%)	10.62%	1.07 (0.93-1.21)	2.92%	0.84 (0.67-1.04)
Urban/Rural Indicator					
Rural	7,118 (16.60%)	10.75%	Reference	3.46%	Reference
Urban	35,750 (83.40%)	10.07%	0.97 (0.87-1.08)	3.09%	0.85 (0.71-1.03)
Type of provider					
For profit	4,704 (10.97%)	9.95%	Reference	2.81%	Reference
Government	4,760 (11.10%)	10.97%	1.02 (0.87-1.20)	3.59%	1.18 (0.90-1.54)
Nonprofit	33,404 (77.92%)	10.10%	0.94 (0.83-1.06)	3.13%	1.04 (0.84-1.28)
Medical School Affiliation					
Major	9,521 (22.21%)	9.47%	Reference	3.07%	Reference
Limited	8,310 (19.39%)	10.41%	1.17 (1.04-1.32)	3.21%	1.12 (0.91-1.36)
Graduate	2,509 (5.85%)	12.16%	1.36 (1.16-1.62)	4.15%	1.44 (1.10-1.88)
No affiliation	22,528 (52.55%)	10.18%	1.11 (1.01-1.25)	3.05%	1.09 (0.90-1.31)
Hospitalist experience					
First year	9,525 (22.22%)	10.49%	Reference	3.45%	Reference
Second year	11,481 (26.78%)	9.87%	0.88 (0.81-0.97)	3.07%	0.85 (0.72-0.99)
Third year	11,410 (26.62%)	10.07%	0.89 (0.81-0.98)	3.29%	0.88 (0.75-1.03)
Forth year	10,452 (24.38%)	10.37%	0.90 (0.82-0.99)	2.80%	0.74 (0.63-0.87)

Abbreviations: SD standard; DRG, Diagnosis-Related Group.

<sup>a</sup> Odds ratio are from a multilevel model adjusted for all characteristics presented in the table, as well as patients' comorbidities and Diagnosis Related Group-Major Diagnostic Category (DRG-MDC).

**Online eTable 3.** Mortality in the 30 days after admission, and hospital mortality, as a function of the number of years of experience of the 2,026 hospitalists who practiced in the same hospital over their first four years, adjusted for patient and hospital characteristics, and limited to patients with a medial DRG.

Characteristics	N (%) or Mean (SD)	30 day mortality rate post hospital admission		Hospital mortality rate	
		Observed rate	Odds Ratio <sup>a</sup> (95% CI)	Observed rate	Odds Ratio (95% CI)
All	33,996	11.45%		3.40%	
Age (Per year)	80.9 (8.01)	11.45%	1.05 (1.05-1.06)	3.40%	1.03 (1.02-1.04)
Gender					
Female	21,849 (64.27%)	10.69%	Reference	3.08%	Reference
Male	12,147 (35.73%)	12.83%	1.21 (1.12 -1.31)	3.98%	1.19 (1.05-1.36)
Medicaid eligible					
No	26,070 (76.69%)	11.60%	Reference	3.47%	Reference
Yes	7,926 (23.31%)	10.96%	0.96 (0.87-1.05)	3.18%	0.87 (0.74-1.03)
Education (Percent of persons in zip code 25+ years with high school education or higher) (Per percent)	86.4 (8.37)	11.45%	0.99 (0.99-1.01)	3.40%	0.99 (0.98-1.01)
Number of hospitalizations in 12 months before admission (Per hospitalization)	1.4 (1.78)	11.45%	0.96 (0.93-0.99)	3.40%	0.94 (0.89-0.99)
Race					
White	29,181 (85.84%)	11.67%	Reference	3.44%	Reference
Black	3,021 (8.89%)	10.00%	0.88 (0.77-1.02)	3.11%	0.97 (0.77-1.23)
Hispanic	1,045 (3.07%)	9.57%	0.89 (0.71-1.13)	3.06%	0.98 (0.66-1.45)
Other	749 (2.20%)	11.48%	1.02 (0.80-1.30)	3.47%	1.03 (0.69-1.56)
Residence prior to hospitalization					
Community	30,547 (89.85%)	10.73%	Reference	3.13%	Reference
Nursing facility and other institutions	3,449 (10.15%)	17.83%	1.70 (1.52-1.88)	5.80%	1.69 (1.43-2.01)
Bed Size					
> 500	8,923 (26.25%)	11.03%	Reference	3.50%	Reference
350 <, <= 500	6,488 (19.08%)	11.79%	1.05 (0.93-1.19)	3.53%	0.97 (0.79-1.20)
200 <, <= 350	9,966 (29.32%)	11.20%	0.99 (0.88-1.12)	3.31%	0.91 (0.74-1.12)

<= 200	8,619 (25.35%)	11.94%	1.08 (0.94-1.24)	3.31%	0.90 (0.71-1.14)
Urban/Rural Indicator					
Rural	5,854 (17.22%)	12.03%	Reference	3.66%	Reference
Urban	28,142 (82.78%)	11.34%	0.94 (0.84-1.06)	3.35%	0.89 (0.72-1.08)
Type of provider					
For profit	3,649 (10.73%)	11.37%	Reference	3.12%	Reference
Government	3,872 (11.39%)	12.01%	0.99 (0.84-1.18)	3.67%	1.07 (0.80-1.44)
Nonprofit	26,475 (77.88%)	11.38%	0.94 (0.82-1.07)	3.40%	1.02 (0.81-1.29)
Medical School Affiliation					
Major	7,465 (21.96%)	10.61%	Reference	3.30%	Reference
Limited	6,431 (18.92%)	11.88%	1.20 (1.06-1.37)	3.47%	1.13 (0.91-1.40)
Graduate	1,993 (5.86%)	13.50%	1.37 (1.14-1.64)	4.37%	1.42 (1.05-1.91)
No affiliation	18,107 (53.26%)	11.43%	1.14 (1.01-1.29)	3.31%	1.08 (0.88-1.32)
Hospitalist experience					
First year	7,542 (22.18%)	11.84%	Reference	3.82%	Reference
Second year	9,047 (26.61%)	11.20%	0.88 (0.79-0.97)	3.38%	0.83 (0.70-0.99)
Third year	9,050 (26.62%)	11.23%	0.87 (0.78-0.96)	3.50%	0.84 (0.71-0.99)
Forth year	8,357 (24.58%)	11.63%	0.89 (0.81-0.99)	2.93%	0.68 (0.57-0.82)

Abbreviations: SD, standard; DRG, Diagnosis-Related Group.

<sup>a</sup> Odds ratio are from a multilevel model adjusted for all characteristics presented in the table, as well as patients' comorbidities and Diagnosis Related Group-Major Diagnostic Category (DRG-MDC).