

The Status of Hospital Medicine Groups in the United States

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BACKGROUND: Hospitalists, defined as hospital-based physicians who take responsibility for managing the medical needs of inpatients, represent a significant trend in physician specialization. However, only limited anecdotal data quantifying the status of hospital medicine groups around the country is available.

OBJECTIVE: To better understand the extent and nature of the hospitalist movement, utilizing data from the 2003 Annual Survey of the American Hospital Association (AHA).

STUDY POPULATION: 4895 acute care hospitals in the United States.

MEASUREMENTS: Number and percentage of hospitals with hospital medicine groups; mean number of hospitalists per group; hospitalists per average daily census (ADC) of 100 patients; distribution of groups by employment model.

DESCRIPTIVE VARIABLES: Census region; rural/urban status; number of beds; organizational control; teaching status.

RESULTS: There are approximately 1415 hospital medicine groups and 11 159 hospitalists in the United States. The overall penetration of hospital medicine groups at hospitals is 29% (55% at hospitals with 200 or more beds), and the in-hospital impact at hospitals with hospital medicine groups is 3.93 hospitalists per 100 ADC. The average hospital medicine group has 7.9 hospitalists. There is a fairly equal distribution among the 3 major employment models for hospital medicine groups: hospital employees, independent provider groups, and physician groups. All these measures can vary substantially, depending on the characteristics of individual hospitals.

CONCLUSIONS: Hospital medicine appears to have become part of the mainstream delivery of health care in the United States. No employment model of hospital medicine group appears to dominate this specialty. We expect there will continue to be growth and diversity in the implementation of hospital medicine groups. *Journal of Hospital Medicine* 2006;1:75–80. © 2006 Society of Hospital Medicine.

KEYWORDS: hospitalist, hospital medicine, hospital medicine group, hospitalist movement, AHA survey, hospital medicine status, hospital medicine growth, hospital medicine characteristics, hospitalist movement status, hospitalist movement growth, hospitalist movement characteristics

The term *hospitalist* was coined in 1996 in an article¹ that appeared in the *New England Journal of Medicine*. Robert M. Wachter, MD, and Lee Goldman, MD, of the University of California, San Francisco, defined hospitalists as hospital-based physicians who take responsibility for managing medical inpatients. Hospitalists were described as having responsibility for seeing unassigned hospital patients and being available for in-hospital consultations. Several years later, the Society of Hospital Medicine posted the definition of a hospitalist as someone whose primary

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professional focus is the medical care of hospitalized patients—in patient care, education, research, and administrative activities.

In January 2002, Wachter and Goldman published a follow-up article,² “The Hospitalist Movement 5 Years Later,” in the *Journal of the American Medical Association*. This formal review of 19 published studies analyzed the impact of hospital medicine groups on financial and clinical outcomes. Wachter and Goldman concluded, “Empirical research supports the premise that hospitalists improve inpatient efficiency without harmful effects on quality or patient satisfaction.” These studies indicate an average reduction of cost per stay of 13.4% and an average reduction in length of stay of 16.6%.

The evolution of the hospitalist movement has been fast paced and extensive. Given the recent pace of growth, a scholarly analysis estimated that the mature hospitalist workforce in the United States will eventually total 20,000, making it the equivalent of the cardiology specialty.³ Beyond sheer growth, medical literature has demonstrated positive effects of the hospitalist model on patient quality outcomes, including readmission rates, postoperative complications, and mortality.^{4–7}

In addition to peer-reviewed medical literature, there is anecdotal evidence about the growth and effects of the hospitalist movement:

- The Society of Hospital Medicine (SHM), the hospitalist professional society, estimated that in 2003 there were 8000 physicians practicing as hospitalists in the United States.⁸
- Twelve of the country’s “top” 15 hospitals have hospital medicine groups.⁸

As hospital medicine groups have proliferated, 4 major employment models have evolved. Hospitalists can be employees of: 1) a hospital or a hospital subsidiary; 2) a multispecialty or primary care physician group; 3) a medical group (local or national) of independent hospitalists; or 4) a university or medical school. However, there is little published data on the prevalence of each of these hospitalist employment models, nationally or by type of hospital.

To better understand the extent and nature of the hospitalist movement, the American Hospital Association (AHA) utilized its 2003 Annual Survey to gather data on hospital medicine groups in the United States

DATA AND METHODS

The data for our analysis came from the 2003 AHA Annual Survey. Conducted since 1946, this survey is the principal data collection mechanism of the American Hospital Association and is a basic source of data on hospitals in the United States about the availability of services, utilization, personnel, finances, and governance. Its main purpose is to provide a cross-sectional view of hospitals and hospital performance over time. In the 2003 survey, a series of items were added about hospitalists including whether hospitals had hospital medicine groups, the number of hospitalists operating in such groups, and the employment model used.

The study population for this analysis was limited to US community hospitals (n = 4895). Community hospitals are defined as all adult and pediatric nonfederal, short-term general, and specialty hospitals whose facilities and services are available to the public. Excluded from the analysis were all federal hospitals, long-term care hospitals, and psychiatric hospitals.

Imputation of Missing Data

In the 2003 survey, 77% of the 4895 US community hospitals answered the question on specific use of hospitalists. To get a complete picture of the number of groups and hospitalists, we imputed data for the nonresponding hospitals.

We performed logistic regression analysis of data from the responding hospitals to estimate the number of nonresponding hospitals that had a group and the number of hospitalists in these groups. The dependent variable in the regression was whether a hospital had a group, and the independent variables included hospital characteristics for which data were available for all US hospitals, both survey respondents and nonrespondents. The results of the regression analysis were then applied to the data for each nonresponding hospital to estimate its probability of having a group. These probabilities were summed over the various nonresponding hospitals to estimate the total number of nonresponding hospitals that had groups.

To impute the number of hospitalists in the nonresponding set of hospitals, the additional number of groups was stratified into the 9 US Census Divisions. On the basis of reported data, the average number of hospitalists per group was calculated at the Census Division level. The per-group value was then applied to the number of additional

groups, and the result was added to the total number of reported hospitalists. The Census Division values were then summed to produce the national total. To produce results for all other control groupings, the national total was then apportioned across the categories according to percentage of hospitalists by category on the basis of the reported data.

Analytical Plan

In analyzing the hospitalist movement across the country, we realized there are 2 dimensions of diffusion, which can be characterized as “breadth” and “depth.” In the present study:

- The measure of breadth is the percentage of hospital medicine groups in a given group of hospitals. In the Results section, this measure is sometimes referred to as “penetration.”
- The measure of depth is the number of hospitalists for each average daily census (ADC) of 100 patients. For instance, for a hospital with an average daily census of 100 that has 4 hospitalists, that measure is 4. To compute this metric for a given category of hospitals (eg, major teaching hospitals), the numerator is the number of hospitalists and the denominator is the ADC at hospitals that have hospital medicine groups. The metric reflects the in-hospital impact of hospital medicine groups at their hospitals.

Using these 2 measures, it is possible to differentiate between a group of hospitals that has many hospital medicine groups but each group has a minimal impact at the hospital versus a group of hospitals that has few hospital medicine groups but each group has a major impact at the hospital.

The analysis also characterizes the employment status of hospitalists by comparing the proportion of hospitals in each of the employment models by category of hospital.

RESULTS

Diffusion and Impact

Overall, the penetration of hospital medicine groups across the 4895 hospitals in the United States is 29% and the in-hospital impact at hospitals with hospital medicine groups is 3.93 hospitalists per 100 ADC. The average hospital medicine group has 7.9 hospitalists at a hospital with an ADC of 200.6.

Geographic Categories (Tables 1A and 2A)

The Northeast (46%) and the Pacific (40%) divisions have the greatest penetration of hospital medicine

TABLE 1A
Diffusion of Hospital Medicine Groups by Geographic Categories

Category	Hospitals	Hospital medicine groups	Hospitals with hospital medicine groups (%)
Region			
1: Northeast	203	94	46%
2: Mid-Atlantic	486	172	35%
3: South-Atlantic	731	272	37%
4: East North Central	732	209	29%
5: East South Central	427	92	22%
6: West North Central	675	106	16%
7: West South Central	737	164	22%
8: Mountain	348	83	24%
9: Pacific	556	223	40%
Rural/urban			
Rural	2166	235	11%
Small urban	1285	488	38%
Large urban	1444	692	48%
Total	4895	1415	29%

Source: AHA Annual Survey file for 2003

Region Definitions: 1 (ME, VT, NH, MA, RI, VT); 2 (NY, NJ, PA); 3 (DE, DC, MD, VA, NC, SC, WV, GA, FL); 4 (OH, IN, IL, MI, WI); 5 (KY, TN, AL, MS); 6 (IA, KS, MO, NE, MN, SD, ND); 7 (LA, AR, OK, TX); 8 (CO, WY, UT, AZ, NM, NV, MT, ID); 9 (CA, OR, WA, AK, HW)

TABLE 1B
Diffusion of Hospital Medicine Groups by Size, Control, and Teaching Status

Category	Hospitals	Hospital medicine groups	Hospitals with hospital medicine groups (%)
Size			
6-24 beds	327	18	6%
25-49 beds	965	88	9%
50-99 beds	1031	168	16%
100-199 beds	1168	372	32%
200-299 beds	624	287	46%
300-399 beds	349	183	52%
400-499 beds	172	116	67%
500+ beds	259	183	71%
Control			
Government	1121	161	14%
Not for profit	2984	1032	35%
For profit	790	222	28%
Teaching status			
Nonteaching	3800	823	22%
Other teaching	779	382	49%
Major teaching	316	210	66%
Total	4895	1415	29%

Source: AHA Annual Survey file for 2003.

Major teaching defined as a member of the Council of Teaching Hospitals and Health Systems (COTH).

TABLE 2A
Impact of Hospitalists on Their Hospitals by Geographic Categories

Category	Groups (hospitals)	Hospitalists	Hospitalists per group	Hospitalists per 100 census
<i>Region</i>				
1: Northeast	94	669	7.1	3.62
2: Mid-Atlantic	172	1133	6.6	2.42
3: South Atlantic	272	1933	7.1	3.21
4: East North Central	209	2087	10.0	4.65
5: East South Central	92	433	4.7	2.83
6: West North Central	106	887	8.4	4.37
7: West South Central	164	1828	11.1	6.24
8: Mountain	83	644	7.8	4.43
9: Pacific	223	1546	6.9	4.56
<i>Rural/urban</i>				
Rural	235	893	3.8	4.85
Small urban	488	3236	6.6	3.03
Large urban	692	7030	10.2	4.43
Total	1415	11 159	7.9	3.93

Source: AHA Annual Survey file for 2003.

Region definitions: 1 (ME, VT, NH, MA, RI, VT); 2 (NY, NJ, PA); 3 (DE, DC, MD, VA, NC, SC, WV, GA, FL); 4 (OH, IN, IL, MI, WI); 5 (KY, TN, AL, MS); 6 (IA, KS, MO, NE, MN, SD, ND); 7 (LA, AR, OK, TX); 8 (CO, WY, UT, AZ, NM, NV, MT, ID); 9 (CA, OR, WA, AK, HW).

groups. The West North Central Division (16%) has the lowest penetration of hospital medicine groups. Hospital medicine groups in the West South Central Division average 11.1 hospitalists, which partially explains why this region has the greatest in-hospital impact (6.24 hospitalists per 100 ADC). At the other end of the spectrum are the Middle Atlantic and East South Central divisions with (2.42 and 2.83 hospitalists per 100 ADC, respectively).

There are more hospital medicine groups in urban locations. The penetration of hospital medicine groups is 48% at hospitals in large metropolitan locations (ie, with a population of more than 1 million), 38% at hospitals in small metropolitan locations, and 11% at hospitals in rural areas. However, rural hospitals have a relatively high in-hospital impact (4.85 hospitalists per 100 ADC), explained by an average group size of 3.8 and an average ADC of 78.4.

Hospital Size, Control/Ownership, and Teaching Status (Tables 1B and 2B)

The penetration of hospital medicine groups increases as the size of the hospital increases. Six percent of hospitals with 6-24 beds have groups, whereas 71% of hospitals with 500+ beds have groups. Among hospitals with 200 or more beds, 55% have hospital medicine groups compared to

TABLE 2B
Impact of Hospitalists on Their Hospitals by Size, Control, and Teaching Status

Category	Groups (hospitals)	Hospitalists	Hospitalists per group	Hospitalists per 100 census
<i>Size</i>				
6-24 beds	18	38	2.1	46.34
25-49 beds	88	260	3.0	17.94
50-99 beds	168	885	5.3	12.75
100-199 beds	372	1757	4.7	5.29
200-299 beds	287	2308	8.0	4.72
300-399 beds	183	1,553	8.5	3.29
400-499 beds	116	1751	15.1	4.35
500+ beds	183	2,607	14.2	2.47
<i>Control</i>				
Government	161	1,674	10.4	5.85
Not for profit	1032	8,481	8.2	3.64
For profit	222	1,004	4.5	4.47
<i>Teaching Status</i>				
Nonteaching	823	4,910	6.0	4.85
Other teaching	382	2,678	7.0	3.25
Major teaching	210	3,571	17.0	3.57
Total	1415	11 159	7.9	3.93

Source: AHA Annual Survey file for 2003.

Major teaching defined as a member of the Council of Teaching Hospitals and Health Systems (COTH).

19% of hospitals with fewer than 200 beds. As would be expected, larger hospitals have larger hospital medicine groups: hospitals with 6-24 beds average 2.1 hospitalists, whereas hospitals with 500+ beds average 14.2 hospitalists. However, hospitalists have a proportionately greater impact at smaller hospitals. Their greatest impact is at hospitals with 6-24 beds (46.34 hospitalists per 100 ADC); their smallest impact is at hospitals with 500+ beds (2.47 hospitalists per 100 ADC).

Of the 3 categories of control, government groups have the lowest penetration of hospital medicine groups (14%). However, the hospital medicine groups at these government-controlled hospitals are large (10.4 hospitalists), and they have a significant in-hospital impact on care at these hospitals (5.85 hospitalists per 100 ADC). Not-for-profit hospitals have the highest penetration of hospital medicine groups (35%), whereas hospital medicine groups at for-profit hospitals have the lowest average size (4.5 hospitalists).

There appears to be a relationship between teaching status and the likelihood that a hospital has a hospital medicine group. The penetration of hospital medicine groups is 66% at major teaching hospitals, 49% at other teaching hospitals, and 22% at nonteaching hospitals. However, nonteaching

hospitals have a relatively high in-hospital impact (4.85 hospitalists per 100 ADC). This is explained by their having an average group size of 6.0, but an average ADC of only 123.0 (compared to 477.0 for major teaching hospitals and 215.7 for other teaching hospitals).

Employment Models

The results of the analysis of hospitalist employment models (data not shown) can be summarized as follows:

- *Employees of hospitals:* This employment model averaged 33% of all groups, with an average size of 9.8 hospitalists. The employees of hospital model was more prevalent in the Mid-Atlantic (56%), New England (49%), and West North Central (45%) regions and in rural hospitals (45%). The East South Central (16%) and West South Central (12%) regions and for-profit hospitals (20%) had fewer hospital employee groups.
- *Employees of medical groups:* This employment model averaged 29% of all groups, with an average of 7.4 hospitalists. More hospitals in the East South Central (35%) and New England (34%) regions had this employment model. Fewer hospitals in the Mid-Atlantic (18%) and West North Central (18%) regions and rural (18%) hospitals had medical group-based groups.
- *Employees of independent hospitalist groups:* This employment group averaged 25% of all groups and had the smallest mean number of hospitalists (6.9). This employment model was more prevalent in for-profit hospitals (43%) and was less prevalent in the New England (9%) and Mid-Atlantic (11%) regions and in major teaching hospitals (11%) and government hospitals (19%).

CONCLUSIONS

Hospital medicine groups appear to have become part of the mainstream delivery of health care. With more than 11 000 hospitalists, the specialty is equivalent in size to the gastroenterology medical specialty.⁹ Fifty-five percent of hospitals with more than 200 beds have hospital medicine groups. Furthermore, it appears that the growth of the hospitalist movement has not peaked. It is likely that the number of hospitals with hospital medicine groups will increase and that existing hospital medicine groups will continue to add hospitalists.

No one employment model of hospital medicine group appears to dominate the health care

landscape. We expect that there will continue to be diversity among the organizations that choose to establish hospital medicine groups.

In light of this growth and diversity, hospital medicine groups appear to be valued by a wide range of stakeholders in the health care industry. The potential benefits provided by hospitalists include financial savings, improved throughput efficiency, improved quality and safety, improved medical education, and better provider satisfaction.

Despite this success story, the hospitalist movement has maintained a relatively low profile among consumers and some segments of the health care industry. This is likely to change. As the hospital medicine specialty gains recognition, hospitalists will receive increased scrutiny and attention. This emerging specialty will need to be able to clearly define its role and document its performance in the constantly changing health care industry.

ADDENDUM

Subsequent to the acceptance of this manuscript, the authors received results of the 2004 Annual Survey of the American Hospital Association. Some highlights of the new data and comparisons to the 2003 results are as follows:

- The penetration of hospitals with hospital medicine groups grew from 29% to 34% (for hospitals with 200+ beds, the penetration grew from 55% to 63%)
- An estimated 1,661 hospitals have hospital medicine groups (an increase of 17% from 2003)
- The average size of a hospital medicine group decreased from 7.9 physicians to 7.5 physicians (a decrease of 5%)
- It is estimated that there are 12,504 hospitalists in the U.S. (an increase of 12% from 2003)
- Hospital medicine groups remain equally distributed among the three employment models: employees of hospitals 30%, employees of medical groups 29%, employees of independent hospitalist groups 29%

These updated results indicate strong hospitalist growth over the one year period and continued diversity among hospital medicine programs, reinforcing the conclusions of the manuscript.

APPENDIX

AHA Annual Survey Overview

Conducted since 1946, the AHA Annual Survey is the principal data collection mechanism of the American Hospital Association and is a basic source

of data on hospitals in the United States. Its main purpose is to provide a cross-sectional view of the hospital field each year and to make it possible to monitor hospital performance over time. The information that it gathers from a universe of approximately 5700 hospitals concerns primarily the availability of services, utilization, personnel, finances, and governance. Newly added to the 2003 survey were the following questions regarding hospitalists:

Do hospitalists provide care for patients in your hospital? YES NO

- **Hospitalist** is defined as a physician whose primary professional focus is the care of hospitalized medical patients (through clinical, education, administrative and research activity).

If yes, please report the number of full time and part time hospitalists?

Full-time _____

Part-time _____

- **Full-time equivalent (FTE)** is the total number of hours worked by all employees over the full (12 month) reporting period divided by the normal number of hours worked by a full-time employee for that same period. For example, if your hospital considers a normal workweek for a full-time employee to be 40 hours, a total of 2080 hours would be worked over a full year (52 weeks). If the total number of hours worked by all employees on the payroll is 208 000, then the number of FTEs is 100 (employees). The FTE calculation for a specific occupational category such as registered nurses is exactly the same. The calculation for each occupational category should be based on the number of hours worked by staff employed in that specific category.

If yes, please select the category below that best describes the employment model for your hospitalists:

- Independent provider group
- Employed by your hospital
- Employed by a physician group
- Employed by a university or school program
- Other

It is the results from these questions that are the subject of this analysis and the manuscript.

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