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Replacing Residents With Midlevel Practitioners: A New York City-Area Analysis

by Barbara A. Green and Tim Johnson

Abstract: Reducing the number of residency positions in U.S. teaching hospitals poses special problems for New York City-area hospitals, which rely heavily on residents to deliver patient care services. This study analyzes the costs of replacing residents with midlevel practitioners under proposals considered in 1994 by Congress to limit the number of first-year training positions and alter the configuration of primary care physicians and specialists produced. The study found that, depending on the replacement strategy used, the proposals could require New York City-area hospitals to hire thousands of midlevel practitioners and other staff, costing a minimum of $242 million annually, to cover patient care services.

Studies conducted by the Greater New York Hospital Association (GNYHA) during the national health care reform debate in 1994 examined the impact of graduate medical education (GME) reform proposals on teaching hospitals in the New York City area and staff replacement strategies that hospitals might employ if such proposals were enacted. This DataWatch reports the findings of a subset of these analyses—namely, estimates of the cost of replacement staffing in New York City-area hospitals under proposals for shrinking and reconfiguring the GME system. The magnitude of the reductions is derived from the number of residency positions we estimated New York City-area hospitals would need to eliminate to comply with residency position allocation proposals before Congress in 1994. While it seems unlikely that Congress will revisit the notion of a residency allocation system anytime soon, market forces or changes in GME financing policies could lead hospitals to downsize their training programs, thereby achieving much the same effect.

Background

GNYHA represents ninety-two hospitals in New York City and surrounding communities, the overwhelming majority of which are teaching hospitals. GNYHA-member hospitals train approximately 85 percent of all
residents in New York State and 13 percent of all residents in the country. Many of these hospitals serve poor, medically underserved communities in which there are few physicians in private practice. Within hospitals, residents play a critical role in delivering services to persons who have no other source of care. Although New York State and New York City have launched several initiatives in recent years to bolster the state's primary care infrastructure, it will take several years for these efforts to show results. In the interim, reductions in residency training programs could jeopardize the ability of inner-city hospitals to care for patients unless adequate replacement personnel are in place.

The survey. To assess the impact of the 1994 federal GME reform proposals, GNYHA surveyed and received responses from all 794 residency training programs in its member hospitals in the 1993-1994 program year. The study encompassed 62 percent of the teaching hospitals in New York State. The resulting database, which is perhaps the only one of its kind, contains the following information: number of approved and filled residency positions, by specialty and graduate year; number of U.S. and international medical school graduates, by specialty and graduate year; number of positions filled through a national match; and number of hours spent by residents, by specialty and graduate year, in inpatient and outpatient care (including community-based settings) in all rotation sites. Data elements used to conduct the study reported here include number of approved positions by specialty and graduate year.

Proposals to reduce the number of residency positions. One approach to reforming GME that received serious consideration by Congress last year called for establishing a federal regulatory system that would allocate residency positions across the country to achieve changes in the output and mix of physicians. The most frequently discussed proposals called for limiting the number of first-year training positions to a certain percentage of U.S. medical school graduates (110 percent was the figure most often cited) and altering the mix of training positions so that half of physicians would enter primary care practice and half would enter specialty practice. In our analyses we examined replacement staffing in the context of a 110 percent ratio of first-year positions to U.S. medical school graduates as well as a 120 percent ratio to show policymakers how alternative goals would affect hospitals.

Study Design

Reduction models. For purposes of this study, all training programs in GNYHA's database were analyzed in the aggregate to determine where this locality stood relative to proposed goals before Congress. Although it was
never explicitly stated that the goals would be applied on a state or regional basis, we proceeded on this assumption because the New York City area represents such a sizable component of the nation’s GME system. Thus, for purposes of this analysis it was assumed that the goals regarding both the relationship between first-year positions and US. medical school graduates and the generalist-to-specialist ratios would be applied to the bloc of training positions in these hospitals, and that cuts in training positions would be distributed proportionately across the country.1

According to the Association of American Medical Colleges (AAMC), the ratio of first-year residents to U.S. medical school graduates during the 1993-1994 program year was 145 percent.2 Using this figure to estimate the reduction necessary to meet specific targets, our analysis revealed that approximately 800 postgraduate year one positions out of a total of 3,400 (nearly 25 percent) would need to be eliminated to satisfy a 110 percent goal, and that approximately 575 postgraduate year one positions (17 percent) would need to be eliminated to satisfy a 120 percent goal. Given that one of the objectives of the physician workforce reform proposals was to increase the output of primary care physicians, our analysis assumed that all of the postgraduate year one positions eliminated would be specialty positions or specialty-track positions. Since specialty training generally requires at least four years, as opposed to three years for primary care training, the total number of positions lost because of the “ripple effect” of cuts in first-year positions under the 110 percent and 120 percent scenarios would be 3,200 and 2,300, respectively. Interestingly, reductions in first-year training positions of the magnitude suggested here would also result in the achievement, or near-achievement, of a fifty/fifty output ratio of generalists to specialists. However, this occurs not because the number of primary care positions is increased substantially, but because the number of specialty positions is reduced dramatically.

Replacement models. We analyzed the costs of replacing residents primarily with midlevel practitioners (physician assistants and nurse practitioners) using two replacement models. The first model was developed using a consensus-group technique with a technical advisory committee convened by GNYHA to assist with the study. The committee consisted of hospital administrators, residency program directors, a nursing director, and a physician assistant (PA). Based on committee members’ experiences with the substitution of PAS and nurse practitioners (NPs) for residents, the committee concluded that, on average, three midlevel practitioners would be needed to replace each resident. This replacement model is obviously simplistic insofar as it fails to distinguish among the replacement needs of different specialties and different postgraduate-year levels. Moreover, it assumes that every resident needs to be replaced, which the expert panel
agreed would not necessarily be the case. Nevertheless, the model provides a “worst-case” estimate of replacement personnel and costs.

The second replacement model is derived from a study conducted by James Knickman and colleagues, which analyzed how internal medicine residents at two urban hospitals spend their time. The investigators conducted a time/motion study involving eight residents during a four-day cycle in one institution and a three-day cycle in the other. Using a consensus-group technique, the investigators developed two alternative strategies for replacing residents with other personnel. One strategy assumes that physicians must perform the bulk of residents’ work when residents are eliminated; the other assumes that midlevel practitioners can play a more substantial role. For our analysis, personnel needs and replacement costs were estimated using the second strategy, called the “midlevel practitioner model.” This model assumes that residents spend 20 percent of their time performing functions that could be done only by a physician and 35 percent of their time performing functions that could be done by a midlevel practitioner. The remaining 11 percent of their time spent on patient care activities (personal and education time are excluded) could be distributed among nurses, laboratory technicians, and unskilled workers (for example, messengers and transporters).

The Knickman model is a useful way to contemplate the replacement of residents; however, its application is limited in several respects. First, the total number of residents included in the study was very small. Second, the study focused only on internal medicine residents, not other types of residents—particularly surgical residents—whose positions stand an equally good chance of being eliminated. Finally, all of the residents in the study were in their first three years of training. The configuration of replacement personnel applicable to this group may not be applicable to fourth-year trainees. Still, for the purposes of our study, we assumed that every residency position eliminated would have to be replaced by the combination of caregivers specified by Knickman and colleagues.

For both replacement models, salary levels for the midlevel practitioners and the other replacement personnel were based on estimates of annual starting salaries for the personnel categories in question in 1994 in the New York City area.

Several comments about the analyses presented here are in order. First, we include residents’ salaries in the total estimated replacement cost because hospitals lose the revenue associated with the residents’ salaries when positions are eliminated. In New York State, residents’ salaries are fully covered by federal and state direct medical education payments. Thus, the elimination of a residency position results in the loss not only of the direct medical education payment, but also of the indirect medical education
payment, creating a major financial loss for the institution. Second, these estimates do not take into account ongoing efforts to increase the proportion of time that residents (particularly in family medicine, internal medicine, and pediatrics) spend at ambulatory care sites.

Third, we do not assume that substitution of midlevel practitioners leads to significant savings in supervisory or ancillary costs (for example, use of diagnostic services), at least in the short run. Our expert panel reported that savings occur with experienced midlevel practitioners, not newly trained ones. Because PAs and NPs now tend to be in short supply in New York State, this analysis assumes that most replacement efforts would involve new graduates. Thus, savings attributable to greater efficiency in the use of diagnostic services and so forth probably would not be realized for several years.

Finally, our analysis does not adjust for any downturn in hospital use. While this is not likely to be the case, given the growth of managed care in the New York City area, the cost estimates presented here are in 1994 dollars, which, in actual dollars, could be realistic four or more years hence.

Study Results

Exhibit 1 shows the number of full-time-equivalent (FTE) midlevel practitioners and the accompanying salary costs that would be needed to replace each resident with three midlevel practitioners under a 110 percent ratio of first-year residents to U.S. medical school graduates. Three years after implementation of this policy, the number of FTEs needed could be

<table>
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<th>Year</th>
<th>Number of positions lost</th>
<th>Number of practitioners needed</th>
<th>Total practitioners’ salaries (millions of dollars)</th>
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<tr>
<td>Year 1</td>
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<td>2,400</td>
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<tr>
<td>Year 2</td>
<td>1,600</td>
<td>4,800</td>
<td>300.0</td>
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<tr>
<td>Year 3</td>
<td>2,400</td>
<td>7,200</td>
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<td>Year 4</td>
<td>3,200</td>
<td>9,600</td>
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<table>
<thead>
<tr>
<th>Year</th>
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<th>Number of practitioners needed</th>
<th>Total practitioners’ salaries (millions of dollars)</th>
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<tbody>
<tr>
<td>Year 1</td>
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<tr>
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<tr>
<td>Year 3</td>
<td>1,725</td>
<td>5,175</td>
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<tr>
<td>Year 4</td>
<td>2,300</td>
<td>6,900</td>
<td>431.3</td>
</tr>
</tbody>
</table>

Sources: Greater New York Hospital Association (GNYHA) Survey of Residency Programs, 1993-1994 program year; and GNYHA Technical Advisory Committee.

Assumes a midlevel practitioner starting salary of 550,000 plus 25 percent fringe benefits.
nearly 10,000 at a cost of $600 million. Exhibit 1 also shows the same analysis under the 120 percent scenario. Here, the projected number of FTEs at the end of three years is approximately 7,000 at a cost of $431 million.

Exhibit 2 shows the number of FTEs required and total replacement costs under the Knickman model. In this scenario the total number of FTEs required would equal approximately 4,400 (of which 2,400 would be midlevel practitioners) at a cost of $336 million under a 110 percent goal, and approximately 3,200 FTEs (of which 1,700 would be midlevel practitioners) at a cost of $242 million under a 120 percent goal.

**Conclusion**

As with overall health care reform, efforts by the federal government to
alter the future physician workforce by creating a centralized residency allocation system did not materialize in 1994. Most experts now agree that there is little chance that such a system will be authorized by Congress any time in the foreseeable future. However, other factors, such as the growing physician surplus, the increasing penetration of managed care in New York and across the country, and potential efforts to reduce Medicare reimbursement for graduate medical education, are likely to encourage many teaching hospitals to rethink their involvement in training physicians.

If this occurs, teaching hospitals stand to lose substantial revenues and incur millions of dollars in new costs as a consequence of the need to replace residents with other practitioners. Thus, policymakers need to design reimbursement policies to ensure that funds are available for hospitals to hire the required replacement personnel. Without adequate funding, these hospitals—many of which serve the poorest communities in the country—may be unable to continue providing high-quality patient care to our most vulnerable populations.

This study was made possible in part by a generous grant from the United Hospital Fund of New York.

NOTES

1. Assuming that cuts are made in proportion to the current distribution of positions across the country yields the most conservative estimate of losses in the New York City region. Alternative ways of allocating cuts, such as according to physician-to-population or resident-to-population ratios, would result in the elimination of much greater numbers of residency positions in the New York City area. See M. Whitcomb, “The Impact of National Graduate Medical Education (GME) Reform Goals on the GME Activity of Individual States” (Unpublished study, The Ohio State University College of Medicine, 1994).


4. In recent years residency review committees in family medicine, internal medicine, and pediatrics have all developed standards calling for residents to spend 25 percent of their time in a continuity-of-care ambulatory care setting. Estimates from GNYHA's database indicate that residents in family, pediatric, and internal medicine now spend an average of 17 percent of their time in other than inpatient settings (family medicine, 32 percent; internal medicine, 12 percent; pediatric medicine, 26 percent). Full compliance with these standards, by definition, means that hospitals must find additional ways to provide inpatient coverage as their residents increase their ambulatory site time.