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## Hospital Medicine Workforce: The Impact of Nurse Practitioner and Physician Assistant Providers

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Nurse practitioners (NPs) and physician assistants (PAs) have been caring for patients since the mid-1960s.<sup>1</sup> Although both roles grew out of a need for more primary care providers, more recently there has been an increase in the utilization of NPs and PAs in acute care roles. This meteoric rise of advanced practice providers in the inpatient setting has been driven by stressors from residency work-hour reforms and from growing financial pressures in healthcare systems, where NPs and PAs are seen as less expensive alternatives.<sup>2,3</sup> Inadequate physician supply to meet the needs of growing healthcare service is also a driving factor. Despite increasing numbers of enrollees and increasing numbers of medical schools, many sources estimate a physician shortage of 50,000 providers by year 2025.<sup>4</sup> To address this growing shortage, the number of NP and PA providers in acute care continues to grow as Kartha and colleagues<sup>5</sup> clearly demonstrate in their study, published in this issue of *Journal of Hospital Medicine*. Their research shows that within hospitals in the Veterans Health Administration (VHA)—the largest coordinated healthcare association in the United States—fully half of all inpatient medical teams are utilizing NPs and PAs in some capacity, most commonly in staffing models working directly with attending physicians or on teams with housestaff.<sup>5</sup>

Many different practice models exist that incorporate NPs and PAs into acute care settings, including models in general medicine and intensive care settings, as well as in specialty care populations such as patients with diabetes or congestive heart failure.<sup>1,6</sup> Few studies, however, delineate specific roles for NPs or PAs in inpatient acute care or provide outcomes-based evidence in support of the proposed models. This is in contrast to research available regarding NP and PA staffing models in the outpatient setting.<sup>7,8</sup> In the current study, Kartha et al.<sup>5</sup> shed light on the use

of NPs and PAs in inpatient medical units at the VHA. Their findings show that the majority of NPs and PAs on the inpatient team function mostly autonomously and perform tasks including performing histories and physicals, writing progress notes, placing orders, and communicating with primary care providers and consultants. Almost half also serve on hospital committees and participate in quality improvement activities. Interestingly, although the training and regulation of NPs and PAs differ considerably,<sup>1</sup> Kartha et al. found that the scope of practice of these providers is generally the same. PAs are more likely to perform procedures and teach nonphysician students but otherwise function similarly to NPs. The clinical workload for NPs and PAs also does not differ, with an average of 6.5 patients seen per day. This information is crucial when analyzing the cost-effectiveness of these providers, especially in light of evidence suggesting that hospitalist physicians typically care for approximately twice as many patients.<sup>9</sup>

Although Kartha et al.<sup>5</sup> focus primarily on describing the scope of NPs and PAs in hospital medicine, they also report on outcomes. Their findings show that presence of NPs and PAs on inpatient teams did not alter patient or nurse satisfaction nor were there any consistent improvements in the perception of care coordination. Of note, assessment of care coordination was based on survey responses from nurse managers and chiefs of medicine, individuals who are not necessarily direct members of the inpatient team, thus questioning the validity of this measure. Other studies on NP/PA models have also focused on patient-centered outcomes. A study by Roy et al.<sup>10</sup> found that an inpatient PA-run service supervised by hospitalists was comparable with a traditional resident-run service, with no significant differences in risk-adjusted length of stay (LOS), mortality, intensive care unit (ICU) transfers, or hospital readmissions. Although total costs were lower on the PA service, this difference was minimal. Gershengorn et al.<sup>11</sup> examined the impact of nonphysician staffing in an ICU setting and again found equivalent care. In this study, an ICU team staffed by NPs and PAs had similar hospital mortality and LOS as compared with a standard housestaff ICU service. Both these studies have limitations in that they are retrospective analyses rather than randomized controlled trials, and they were conducted at academic medical centers, thus narrowing

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their generalizability. Moreover, purity of data is difficult to achieve, as few systems exist where NPs and PAs are the sole providers managing patients without interaction or coverage from physician colleagues.

Given the considerable presence of NPs and PAs in acute care hospitals as documented by Kartha et al.,<sup>5</sup> providing appropriate training in hospital medicine to these clinicians is important. A study by Dhuper and Choksi<sup>12</sup> evaluated a 2-year PA postgraduate training program in hospital medicine. PAs spent 40 hours per week on direct patient care while rotating on general medical floors and ICUs, along with 16 hours per week in didactic instruction. When compared with a traditional 3-year medical residency at the same institution, the PA training program had similar outcomes on patient care including similar number of adverse events, readmissions, and patient satisfaction scores. A more formal postgraduate training program for PAs has been established at the Mayo Clinic Arizona.<sup>13</sup> This 12-month program, based on the Society of Hospital Medicine's (SHM) Core Competencies, consists of general medicine and inpatient medical subspecialty rotations, didactic instruction, and self-directed teaching modules to learn systems-based practices. The Adult Hospital Medicine Boot Camp, sponsored by the SHM and the American Academy of Physician Assistants, is another training opportunity for both NPs and PAs who currently work in or are planning to practice hospital medicine.<sup>14</sup> Finally, in accordance with the move to provide standardized training for providers who practice in acute care settings, professional nursing organizations have developed the Consensus Model for Advanced Practice Registered Nurse Regulation that contains recommendations ensuring similar education and licensure requirements for those who practice in acute care.<sup>15</sup>

Although the optimal utilization of NPs and PAs in hospital medicine is still unknown, the reality is that the number of NPs and PAs actually working in this capacity is significant, as Kartha and his colleagues report.<sup>5</sup> A study of academic medical centers also found that among the institutions that responded to a survey, 31% and 42% used PAs and NPs, respectively, in hospitalist roles.<sup>16</sup> Current evidence suggests that NP- and PA-based care with physician collaboration in an inpatient setting can result in comparable outcomes with physician-only care models. However, much of this evidence is of poor quality or cannot be generalized to all settings. Kartha et al.<sup>5</sup> have provided a good first step in describing the role of NPs

and PAs within hospital medicine. Though their education and training backgrounds are different, the ultimate scope of practice for these 2 groups of providers is very similar. Future research should focus on defining the best practice model for utilization of NPs and PAs in hospital medicine with emphasis on measurable goals. These can include standard outcomes such as LOS but also specific measures of quality and safety such as days of urinary catheter use or percentage of patients receiving venous thromboprophylaxis.<sup>17</sup> By understanding the scope of NP and PA practice, collecting more robust data regarding outcomes, and emphasizing training for NPs and PAs within hospital medicine, there is opportunity to impact the quality and efficiency of care of hospitalized patients.

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