

## A national survey:

## Acceptance of physician assistants and nurse practitioners in trauma centers

Sue M. Nyberg, MHS, PA-C; Kayla R. Keuter, MPH, PA-C;  
Gina M. Berg, PhD; Amy M. Helton, MPA, PA-C;  
Angela D. Johnston, MPA, PA-C

The physician assistant (PA) and nurse practitioner (NP) professions began in the 1960s as part of a strategy to cope with a lack of primary care medical providers in rural and underserved areas. PAs and NPs filled gaps in primary care services that were created as more physicians moved into specialty and subspecialty areas of medicine.<sup>1-5</sup> However, recent employment trends in the PA and NP professions indicate movement away from primary care and into specialty fields.<sup>6-9</sup>

Over the past few years, a change in resident physician staffing regulations in hospitals has created additional employment opportunities for PAs and NPs. On July 1, 2003, the Accreditation Council for Graduate Medical Education (ACGME) instituted standards for all residency programs nationwide limiting the hours worked by a resident physician to no more than 80 hours per week averaged over 4 weeks. As a result of these limitations, teaching hospitals throughout the United States were faced with potential staffing shortages.<sup>10-12</sup> Surgical resident coverage at trauma centers was one specialty affected by the new residency work hour standards. Thus, hospitals have increased utilization of PAs and NPs to fill practitioner gaps.<sup>12-19</sup>

According to the American Academy of Physician Assistants (AAPA) annual census data, the number of PAs working in trauma centers has increased.<sup>9</sup> The purpose of this study was to determine the prevalence of PA/NP utilization in major trauma centers in the United States. It was anticipated that results of this survey would provide additional information about the role of PAs/NPs on a trauma service and identify the potential for future employment growth. Increasing awareness of the responsibilities that have been entrusted to PAs/NPs may stimulate their utilization by trauma centers faced with staffing shortages.

Continued on page 36

The authors are from Wichita, Kansas. **Sue Nyberg** is Associate Professor and Chair, Department of Physician Assistant, Wichita State University. **Kayla Keuter** practices in the Department of Trauma, Wesley Medical Center. **Gina Berg** is Research Assistant Professor, Department of Preventive Medicine and Public Health, University of Kansas School of Medicine. **Amy Helton** practices at Cardiovascular Consultants of Kansas, Inc. **Angela Johnston** works in family practice at Spectrum Family Medical Clinic. The authors have indicated no relationships to disclose relating to the content of this article.

## ABSTRACT

**Objective:** Census data published by professional organizations indicate an upward trend in the number of physician assistants (PAs) working in many specialty fields, including the subspecialty of trauma surgery. As the role of hospital-based PAs and nurse practitioners (NPs) continues to evolve, greater understanding of these roles will help identify future employment trends for these professions. The purpose of this study is to determine the prevalence of PAs and NPs in US trauma centers, to document their roles, and to identify their potential future utilization by trauma centers.

**Methods:** A survey was mailed to 464 directors of major trauma centers in the United States. The survey was designed to evaluate trauma centers' utilization of PAs/NPs. Respondents were asked to identify specific daily tasks of PAs/NPs and to indicate potential for their future utilization.

**Results:** Two hundred forty-six (246) of 464 surveys were returned, for a response rate of 53%. Approximately one-third of reporting major trauma centers reported utilizing PAs/NPs. More American College of Surgeons (ACS)-verified trauma facilities utilized PAs/NPs than did nonverified facilities; and Level I trauma centers used significantly more PAs/NPs than did Level II trauma centers. Nineteen percent (19%) of respondents who did not currently utilize PAs/NPs indicated that they intended to do so in the future. The majority of facilities utilized PAs/NPs to assist with trauma resuscitation and in performing traditional tasks, including obtaining and dictating histories and physical findings, participating in rounds on the general medical floor, and dictating discharge summaries. Fewer than half of reporting facilities indicated that PAs/NPs performed more invasive procedures, such as inserting arterial lines, central lines, chest tubes, and intracranial pressure monitors.

**Conclusions:** PAs and NPs are increasingly utilized as clinicians in the surgical subspecialty of trauma. In most trauma centers, PAs/NPs are utilized to complete the traditional duties of a surgical PA/NP, with fewer performing invasive procedures. Finally, 19% of responding trauma centers who do not currently utilize PAs/NPs state that they intend to in the future, indicating the potential for continued job growth for PAs/NPs in trauma care. This evaluation of the utilization of PAs/NPs in direct care to trauma patients indicates acceptance of PAs/NPs in trauma staffing models.

“The ACS-verified trauma centers reported utilization of PAs/NPs significantly more often than did non-ACS-verified trauma centers.”

**METHODS**

This descriptive, cross-sectional survey was conducted by the Department of Physician Assistant at Wichita State University from March 2007 through June 2007 following approval by the Institutional Review Board at Wichita State University. A listing of trauma centers (1,334) in the United States was obtained from the American Trauma Society. This listing was then narrowed to hospitals designated by their state or region and/or verified by the American College of Surgeons (ACS) as a Level I (186) or Level II (245) trauma center (providing highest levels of trauma care). The remaining trauma centers were designated as Level III/IV/V or unspecified and excluded from the survey population. A cover letter, a nine-item survey, and a stamped return envelope were then mailed to the directors of trauma care for each of the remaining 464 facilities.

Survey questions were designed to determine current utilization of staff members (PAs, NPs, and surgical residents) and their typical responsibilities, as well as PA/NP participation on other rapid-response teams (code blue, critical illness, etc.). If PAs/NPs were not currently utilized, respondents were asked to indicate if they anticipated future utilization of PAs/NPs as a part of their trauma team. Questions regarding institution demographics, specifically level of verification, were also included.

Results are reported in percentages. Pearson’s chi-square test of association analysis was used to evaluate the relationships between trauma center verification/designation and

use of PAs/NPs. Data were analyzed using SPSS Version 15.0 for Windows.

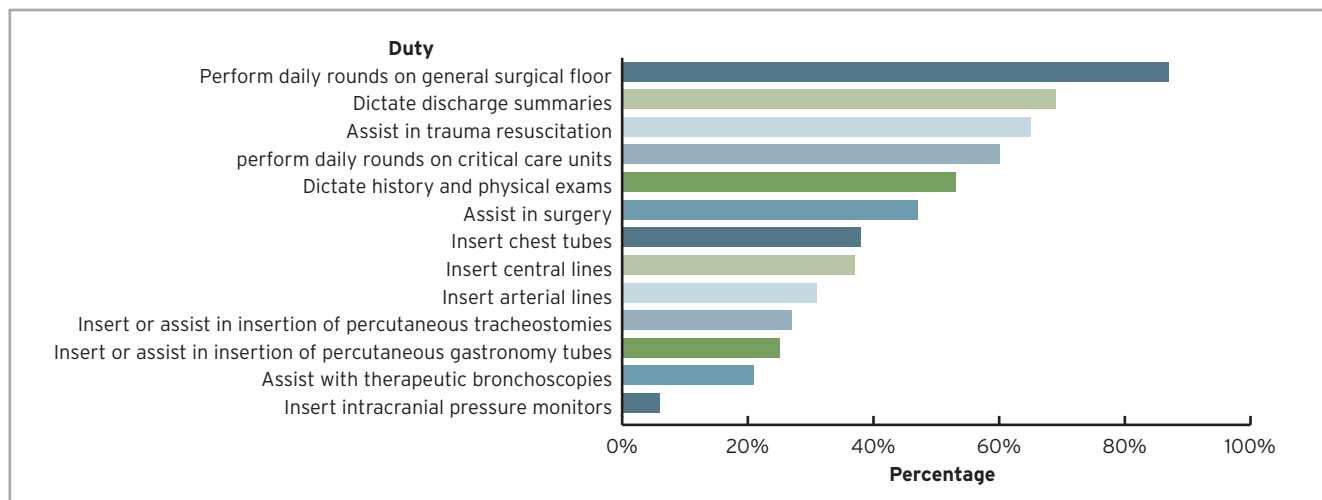
**RESULTS**

Two hundred forty-six (246) of the 464 mailed surveys were returned for a response rate of 53%. Slightly more than half (56.1%) of responding trauma centers reported ACS verification; of those, 45.7% reported Level I and 54.3% reported Level II status. The majority of the respondents (92.7%) reported being designated as trauma centers by state or regional guidelines. Approximately one-third (34.6%) of respondents reported utilization of NPs and 32.9% reported utilization of PAs on their hospital trauma service. Slightly more than half (54.1%) of all respondents reported utilizing surgical resident physicians.

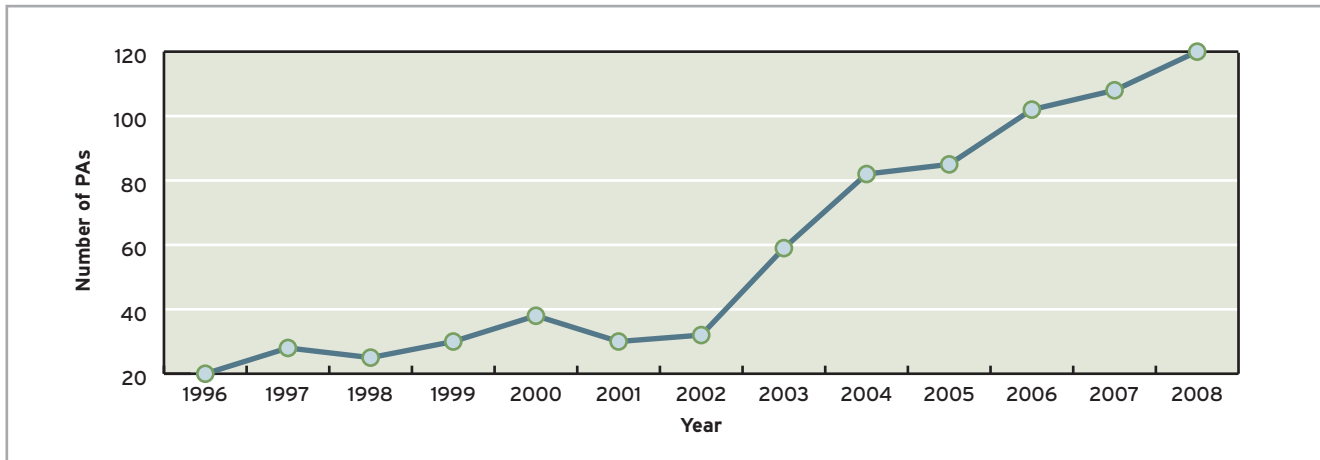
Responding ACS-verified trauma centers (62.3%) reported utilization of PAs/NPs significantly more frequently than did non-ACS-verified trauma centers (41.1%,  $P < .01$ ). A significantly greater proportion of Level I centers (73.0%) employed PAs/NPs than did Level II centers (53.3%,  $P = .017$ ). Trauma centers that had surgical residents available used PAs/NPs significantly more (66.2%) than did trauma centers that did not have surgical residents available (40.7%,  $P < .01$ ).

The majority of responding trauma centers utilized PAs/NPs in trauma resuscitation and in traditional tasks of a surgical PA/NP (Figure 1). A number of these facilities reported that PAs/NPs performed invasive procedures such as inserting chest tubes (38%), arterial lines (31%), central lines (37%), and intracranial pressure monitors (7%). In addition to caring for trauma patients, 55.2% of trauma PAs/NPs provided direct patient care to nontrauma, critical care patients. Only 7.5% of PAs/NPs utilized on responding trauma services functioned as members on other specialized rapid response teams (eg, code blue, sepsis, and stroke).

Respondents also indicated that of those institutions that did not currently utilize PAs/NPs, 19% intended to utilize



**FIGURE 1.** Duties and responsibilities of PAs and NPs on the trauma service



**FIGURE 2.** Number of PAs listing trauma surgery as primary specialty<sup>9</sup>

them in the future. An additional 14% were undecided about future utilization of these providers.

**DISCUSSION**

Census data published by the AAPA from 1996 to 2008 indicate an upward trend in the number of PAs working in the subspecialty of trauma surgery (Figure 2). In 1996, AAPA reported that there were 20 PAs working in trauma centers throughout the United States. This number grew slowly until around 2002, when the number of PAs in trauma centers began to increase at a faster rate. By 2008, more than 120 PAs reported working in trauma centers.<sup>9</sup> The American Academy of Nurse Practitioners does not publish specific census data regarding the number of NPs working in trauma. However, Kleinpell reported that of 423 acute care NPs surveyed, 5% worked in trauma.<sup>20</sup>

An ACS-accredited Level I trauma center in Wichita, Kansas, was affected by the ACGME limitation on resident work hours. Following the discontinuation of surgical resident coverage for the trauma service, the facility chose to hire PAs/NPs and full-time trauma surgeons to fully staff the hospital’s trauma team. Despite the implementation of resident work hour restrictions and the subsequent changes in staffing, this facility was able to obtain recertification as a Level I Trauma Center by the ACS after restructuring the trauma team to include PAs/NPs.<sup>13</sup>

In June 2002, the Department of Surgery at the University of Louisville proactively incorporated two full-time NPs on their trauma service. This allowed surgical resident hours to be reduced from more than 90 hours per week (prior to ACGME limitations) to 79 hours per week, which were within the ACGME specifications. Analysis of patient outcome data from 2001 to 2003 found no adverse effects on patient mortality or quality of care for trauma patients.<sup>14</sup>

Toledo Children’s Hospital and The Toledo Hospital transitioned from surgical residents to PAs on their Level II trauma service. A retrospective study analyzing efficiency

and effectiveness of PAs showed no negative impact on patient outcomes.<sup>17</sup>

Miller and colleagues completed a review of medical record documentation at Hurley Medical Center in Flint, Michigan, to determine efficiency of the use of PAs along with trauma surgeons. Researchers concluded that the trauma surgeon/PA model allowed for increased quality of care for trauma patients without adversely affecting hospital costs.<sup>18</sup> The efficiency and success of the trauma surgeon/PA model resulted in the hospital acquiring verification as a Level II trauma center by the ACS.

The Shock Trauma Center in Baltimore, Maryland, began to utilize certified NPs for discharge rounds and showed no decrease in their efficiency.<sup>15</sup> Another Level I trauma center, F.H. “Sammy” Ross Jr. Trauma Center in Charlotte, North Carolina, utilized “midlevel providers”

“Responsibilities of PAs/NPs on a trauma service can be similar to some of the duties of medical and surgical residents.”

(MLPs) to assist residents by performing tertiary examinations on trauma patients. MLPs were able to identify incidental findings and direct patients to further care.<sup>16</sup> Moreover, in a recent study, Dhuper and Choski compared patient outcomes following replacement of medical residents with PAs and hospitalist physicians in a community hospital in New York. They found a statistically significant lower all-cause and case mix index-adjusted mortality following implementation of the PA-hospitalist model.<sup>19</sup>

Responsibilities of PAs/NPs can be similar to some of the duties of medical and surgical residents. Duties performed by NPs on the trauma service at the University of

“Many of these centers are also utilizing PAs/NPs to perform procedures that were previously performed only by physicians.”

California, Davis, Medical Center include (but are not limited to) initial evaluation of patients, determining appropriate treatment plans, and planning discharges.<sup>6</sup> Riportella and colleagues conducted a nationwide survey of 391 teaching hospitals and learned that these hospitals would continue to utilize PAs/NPs to carry out some of the responsibilities typically carried out by resident physicians. Some hospitals planned to expand the number of PAs/NPs used within their facility.<sup>21</sup>

Our analysis of duties also indicates that PAs/NPs are performing some invasive procedures previously performed only by physicians. Research supports the efficacy and safety of having PAs/NPs perform intracranial pressure monitoring<sup>22</sup> and chest tube placement.<sup>23</sup> As the number of PAs/NPs within the trauma setting continues to grow, it is expected that their duties will expand and responsibilities will increase.

The satisfaction of patients and physicians after PAs/NPs are added to a trauma service has been investigated, with results indicating that hospital staff, attending and consulting physicians, and trauma patients are generally satisfied with the care provided by PAs/NPs.<sup>13,24-25</sup> Cincinnati Children's Hospital Medical Center, a Level I pediatric trauma center, showed higher satisfaction scores among nurses and patient families with their pediatric NPs when compared to satisfaction with residents.<sup>24-25</sup>

#### LIMITATIONS

Results of this survey may be limited by the 53% response rate and the exclusion of smaller trauma centers. PAs and NPs may be utilized differently in lower level acuity trauma centers. In addition, this survey was addressed to hospital directors of trauma services. This position may be held by persons of varied backgrounds who may not be familiar with the full role of PAs/NPs.

#### CONCLUSIONS

Approximately one-third of responding trauma facilities (both Level I and Level II) reported utilizing PAs/NPs on their trauma service, with the majority being verified by the ACS. This indicates that the staffing model utilizing PAs/NPs providing direct care to the trauma patient (with or without surgical residents) has been accepted by the highest accrediting program as well as by established trauma care organizations. This reported use of PAs/NPs in direct care of trauma patients indicates a reasonable solution for staffing trauma centers.

While the majority of reporting trauma centers are utilizing PAs/NPs to complete traditional duties (histories and physical examinations, resuscitation, and discharge summaries), many of these centers are also utilizing PAs/NPs to perform invasive procedures that were previously performed exclusively by physicians.

Of those reporting trauma centers not currently employing PAs or NPs in trauma service, 19% indicate the potential for utilization of them in the future. This highlights the potential for continued job growth for PAs/NPs in US trauma centers. Finally, this evaluation of the utilization of PAs/NPs in direct care to trauma patients indicates the acceptance of PAs/NPs in trauma staffing models. **JAAPA**

**Acknowledgment:** The authors would like to thank Wesley Medical Center Trauma Department for financial support with administration of the survey.

#### REFERENCES

- Holt N. "Confusion's masterpiece": the development of the physician assistant profession. *Bull Hist Med.* 1998;72(2):246-278.
- Condit D. Our military heritage. *Physician Assist.* 1993;17(11):58,61-62,65-67.
- Society for the Preservation of Physician Assistant History. Timeline. Physician assistant history center. <http://www.pahx.org/timeline.html>. Accessed December 11, 2009.
- Society of Trauma Nurses position statement on the role of the nurse practitioner in trauma. *J Trauma Nurs.* 2005;12(3):71-72.
- Garibaldi RA, Popkave C, Bylsma W. Career plans for trainees in internal medicine residency programs. *Acad Med.* 2005;80(5):507-512.
- Spisso J, O'Callaghan C, McKennan M, Holcroft JW. Improved quality of care and reduction of housestaff workload using trauma nurse practitioners. *J Trauma.* 1990;30(6):660-663.
- Schweer LH, Cook BS, Fanta KB. Trauma nurse practitioner: front line approach to management of the pediatric trauma patient in an academic program. *J Trauma Nurs.* 2004;1(4):157-163.
- Kleinpell RM, Ely EW, Grabenkort R. Nurse practitioners and physician assistants in the intensive care unit: an evidence-based review. *Crit Care Med.* 2008;36(10):2888-2897.
- American Academy of Physician Assistants. Data and statistics. <http://www.aapa.org/about-pas/data-and-statistics>. Accessed December 11, 2009.
- Accreditation Council for Graduate Medical Education (ACGME). Information related to the ACGME's effort to address resident duty hours and other relevant resource materials. [http://www.acgme.org/DutyHours/dutyHrs\\_Index.asp](http://www.acgme.org/DutyHours/dutyHrs_Index.asp). Accessed December 11, 2009.
- Wallack MK, Chao L. Resident work hours: the evolution of a revolution. *Arch Surg.* 2001;136(12):1426-1431.
- Duffy K. Physician assistants: filling the gap in patient care in academic hospitals. *Perspect Phys Assist Educ.* 2003;14(3):158-167.
- Nyberg SM, Waswick W, Wynn T, Keuter K. Midlevel providers in a level I trauma service: experience at Wesley Medical Center. *J Trauma.* 2007;63(1):128-134.
- Christmas AB, Reynolds J, Hodges S, et al. Physician extenders impact trauma systems. *J Trauma.* 2005;58(5):917-920.
- Haan JM, Dutton RP, Willis M, et al. Discharge rounds in the 80-hour workweek: importance of the trauma nurse practitioner. *J Trauma.* 2007;63(2):339-343.
- Huynh TT, Moran KR, Blackburn AH, et al. Optimal management strategy for incidental findings in trauma patients: an initiative for midlevel providers. *J Trauma.* 2008;65(2):331-334.
- Oswanski MF, Sharma OP, Raj SS. Comparative review of use of physician assistants in a level I trauma center. *Am Surg.* 2004;70(3):272-279.
- Miller W, Riehl E, Napier M, et al. Use of physician assistants as surgery/trauma house staff at an American College of Surgeons-verified level II trauma center. *J Trauma.* 1998;44(2):372-376.
- Dhuper S, Choksi S. Replacing an academic internal medicine residency program with a physician assistant-hospitalist model: a comparative analysis study. *Am J Med Qual.* 2009;24(2):132-139.
- Kleinpell RM. Acute care nurse practitioner practice: results of a 5-year longitudinal study. *Am J Crit Care.* 2005;14:211-219.
- Riportella-Muller R, Libby D, Kindig D. The substitution of physician assistants and nurse practitioners for physician residents in teaching hospitals. *Health Aff (Millwood).* 1995;14(2):181-191.
- Kaups KL, Parks SN, Morris CL. Intracranial pressure monitor placement by midlevel practitioners. *J Trauma.* 1998;45(5):884-886.
- Bevis LC, Berg-Copas GM, Thomas BW, et al. Outcomes of tube thoracostomies performed by advance practice providers vs trauma surgeons. *Am J Crit Care.* 2008;17(4):357-363.
- Shebesta KF, Cook B, Schweer L, et al. Pediatric trauma nurse practitioners increase bedside nurses' satisfaction with pediatric trauma patient care. *J Trauma Nurs.* 2006;13(2):66-69.
- Fanta K, Cook B, Falcone Jr RA, et al. Pediatric trauma nurse practitioners provide excellent care with superior patient satisfaction for injured children. *J Pediatr Surg.* 2006;41:277-281.