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The promise and problems of non-physician practitioners in general surgery education: Results of a multi-center, mixed-methods study of faculty

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ABSTRACT

Background: Nurse Practitioners and Physician Assistants – called non-physician practitioners or NPPs – are common, but little is known about their educational promise and problems.

Methods: General surgery faculty in 13 residency programs were surveyed (N = 279 with a 71% response rate) and interviewed (N = 43) about experiences with NPPs. The survey documents overall patterns and differences by program type and primary service; interviews point to deeper rationales and concerns.

Results: NPPs reduce faculty and resident workloads and teach residents. NPPs also reduce resident exposure to educationally valuable activities, and faculty sometimes round, make decisions, and operate with NPPs instead of residents. Interviews indicate that NPPs can overly reduce resident involvement in patient care, diminish resident responsibility and decision making, disrupt team dynamics, and compete for procedures.

Conclusions: NPPs both enhance and hinder surgical education and highlight the need to more clearly articulate learning outcomes for residents and activities necessary to achieve those outcomes.

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Constraints on the work hours and schedules of residents accelerated a movement that began in the 1970s to augment staff who could assume some of the workload of residents.^{1–3} Many residency programs hired non-physician practitioners (hereafter NPPs), most of whom are either Nurse Practitioners (NPs) or Physician Assistants (PAs). In many programs, NPPs work during the day only, but in some they cover nights⁴ or provide 24/7 care.⁵ A recent national survey of general surgery residencies indicates that 79% have at least one NPP, with a median of 3.5 in those that employ at least one.⁶ Studies show that NPPs reduce the workloads of residents and attendings, facilitate duty-hour compliance, provide clinical instruction, and are desired by both faculty and residents.^{2,4,7–9} For some, those patterns are sufficient to declare NPPs an educational asset.^{1,6,10}

Scattered evidence, however, hints at a more complex relationship between NPPs and resident education. In a multi-center study of ICU rotations among general surgery residents, fewer than half claimed that NPPs were a positive presence, with 31% noting that they were a “detriment” and 21% reporting “no effect.”⁷ A single-site study found confused communication among team members, especially among interns and PGY3s (50% and 80%, respectively).¹¹ Other studies suggest that attendings might rely on, prefer, and trust NPPs more than residents,^{12,13} that NPPs might disturb the team hierarchy and usurp patient care experiences,^{7,14–16} and that nurses might bypass residents and call NPPs preferentially for patient-care issues.⁷ These possibilities have received little systematic attention.

In addition, previous studies have not considered whether the educational impact of NPPs varies across services and types of programs. Sub-specialty services might have fewer residents and a higher NPP-to-resident staffing ratio; programs without a university affiliation might embrace a more private-practice approach and pursue revenue for NPPs – like first assisting in the OR – that conflict with resident education. These differences across services and program types might shape how NPPs enhance or diminish the educational experiences of residents.

We aim to extend our understanding of the educational promise and problems of NPPs in a broad range of general surgery programs. We focus on the views and experiences of attending surgeons, not residents or NPPs, as they have a long-term perspective on resident education and in many cases considerable experience with NPPs. Their perspective, of course, is not the only one of value, but it is an important one.

1. Method

The study includes faculty from 13 general surgery programs located in 10 states and all continental U.S. time zones. Local coordinators secured IRB approval, administered the paper questionnaire, and gathered materials enclosed in envelopes to assure confidentiality. The response rate was 71% (N = 279). The 14 questionnaire items were suggested by previous studies and grounded upon an earlier ethnographic project conducted by the lead author.¹⁷ Items had five point responses ranging from “strongly disagree” to “strongly agree.” The questionnaire was critiqued for face validity by the Surgical Education and Performance Group at Southern Illinois University (Springfield, Illinois).

The last item solicited interview volunteers, who provided contact information separately to ensure questionnaire anonymity. Semi-structured interviews probed how the work and responsibilities of NPPs might facilitate or impede the education of residents. The lead author conducted all 43 interviews, where participants were drawn from 164 volunteers (a 59% volunteer rate). The aim was to interview roughly 3 faculty chosen randomly from the volunteer roster at each site. Interviews averaged 24 min

and were conducted by telephone, recorded (with permission), and transcribed verbatim.

Data analysis took two forms. Questionnaire data were analyzed with Stata 14 (College Station, TX). Results focus upon the percent who “agree or strongly agree” to ease interpretation. Statistical significance was assessed by Chi-square tests; a *P* threshold of 0.05 was used to determine significance. The qualitative analysis was largely conducted by the lead author, an external investigator with experience analyzing qualitative data, who reviewed themes through discussions with two other authors, JSS, a doctoral student in the social sciences, and JDM, a surgical educator. The 321 interview transcript pages were analyzed for main themes after multiple readings and use of MAXQDA 12 (Berlin, Germany). Themes are categories, larger than typical qualitative “codes,” that represent faculty beliefs about the promise and problems of NPPs for resident education.¹⁸ The themes were similar across interviews despite differences in program characteristics and the primary services of faculty. Themes are illustrated by representative quotations, where unique IDs identify faculty.

2. Results

Table 1 results are restricted to the 78% of faculty (N = 218) who have at least one NPP on their primary service. After each question, the overall percent who “agree or strongly agree” is noted, followed by the contrasts for program type (academic vs. community) and the faculty member’s primary service (general surgery vs. sub-specialty). Overall, the strongest agreement occurred in response to items 1 (88%) and 2 (80%), which asked whether NPPs reduce the workloads of faculty and residents and also help residents comply with duty-hour restrictions. Item 7 also shows strong agreement (77%) and indicates that faculty believe NPPs help teach residents. In contrast, item 6 suggests that faculty strongly reject (agreement of only 18%) the idea that NPPs reduce the amount of teaching they do on their service. Together, these items point to a positive educational assessment – lowered workloads, the facilitation of duty-hour compliance, and NPP contributions to teaching that augment continued contributions by faculty.

Several items, however, suggest that faculty do not view NPPs as a straightforward educational advantage for residents. For example, item 3 suggests that about 40% of faculty disagree that the work performed by NPPs is non-educational, whereas items 4 and 9 show that about half of faculty agree that NPPs reduce resident exposure to educationally valuable pre- and post-operative care. Item 5, likewise, suggests that 33% of faculty believe that NPPs sometimes assist in the OR in a way that reduces opportunities for residents. Faculty agree that NPPs offer more knowledge and consistency than rotating residents (72% - item 11) and sometimes round and make decisions with NPPs instead of the resident team (70% - item 13). Residents thus pay a price for the assistance of NPPs – less exposure to educational activities and a less central role in helping to care for patients and manage services.

The right side of the table contains the pairs of contrasts for program type and service. Overall, NPPs are more common in programs with a university affiliation (87% vs. 68%) and on sub-specialty services (91% vs. 58%). With respect to program type, 6 of the 14 items differ significantly (at *P* < 0.05). Three of the items (1, 2, and 7) showed the strongest overall level of agreement, as noted earlier, and are now seen to be driven by very strong agreement among those in academic programs. First assisting by NPPs is more common in community programs (43% vs. 26% – item 5), whereas rounding and making decisions with NPPs instead of residents are more common in academic programs (77% vs. 59% – item 13). Only two items (11 and 13) differ for faculty on general surgery and sub-specialty services.

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