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Optimizing the integration of advanced practitioners in a department of surgery: An operational improvement model

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ABSTRACT

Physician assistants (PAs) and nurse practitioners (NPs) have established themselves as key members of the healthcare team to supplement practicing physicians in patient care. PAs and NPs are collectively referred to as "advanced providers" (APs) and work not only in primary care but in general surgery and surgical subspecialties. Studies have addressed AP integration into the profession of medicine and have examined cost and efficacy of APs, attitudes about APs among residents, and educational impact of APs, but very little literature exists that describes a formalized approach to AP integration into a department of surgery, specifically with AP/resident integration. The purpose of this paper is to describe an initiative for developing an operational improvement model for APs working with residents on surgical inpatient services in a large academic health center. The model consists of four components and each component is described in detail from discovery state towards continuous improvement. Formal professional development opportunities for APs as well as appointing a Clinical Director for Surgical APs have positively impacted AP integration into the department of surgery.

Introduction

Physician assistants (PAs) and nurse practitioners (NPs) have established themselves as key members of the healthcare team to supplement practicing physicians in patient care. In the mid-1960s when both professions originated, NPs and PAs served the health needs of the people largely in primary care as increasing numbers of physicians were choosing to specialize and changes in Medicare and Medicaid occurred.[1–3] While PAs and NPs are now commonplace in healthcare, literature suggests that their entrance into the field was not fully embraced and suffered from interprofessional tensions and territorialism, as well as minimal organizational support.[1,4–7] The underlying tensions seemed to stem mainly from definition and acceptance of role development of these new professionals. In a participatory action research study, Burgess and Purkis (2010) revealed the political nature of the NP role in primary health care and revealed how cultivating collaborative relations with clients, colleagues, and healthcare leaders facilitated NP role development.[4] In 2011, Burgess et al. further explored NP collaboration in primary care and established a framework for assessing NP role integration.[5]

PAs and NPs have had various titles such as "midlevel provider," "non-physician practitioner" and "physician extender," and as their professions have matured over the years, today, both PAs and NPs are collectively referred to as "advanced practitioners" (APs).[1,8,9] Currently, there are over 115,500 Certified PAs and 234,000 licensed NPs in the United States working not only in primary care but in general surgery and surgical subspecialties.[10–14] With the introduction of resident duty hour restrictions, an increased number of APs have been hired to help ensure safe and effective patient care.[5,7,15–17] In a recent study by Johal and Dodd, a systematic review of literature was performed to examine the use of APs on surgical/trauma services and their effect on patient outcomes and resident workload. The authors reported high satisfaction rates among surgeons, residents and nursing staff with the addition of APs. Additionally, they found that the inclusion of APs resulted in a decrease in overall resident work hours, increased operating room time and exposure to clinic, reduced number of page notifications, increased time for educational activities, and increased sleep time.[13] In a survey study by Buch et al. (2008) that explored how

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surgical residents perceive their education and residency experience with the integration of APs, high satisfaction rates were also reported for most of the factors listed in the aforementioned study but interestingly, residents and APs had very different perceptions about where APs fall within the surgical hierarchy, how much APs contribute to the residents' clinical education, and whether APs provide better continuity of care. The authors stated that no formal orientation of the residents occurs at their institution to the various AP roles and that they recommend having APs orient the resident teams to their function and roles at the beginning of each rotation.[12]

Over the past five years, the Department of Surgery at Indiana University, in conjunction with the affiliated physician employment group, hired an increasing number of APs on both the general surgery and sub-specialty resident-based teams to improve continuity of care and to offset decreased resident workforce. In doing so, it was desired to have APs be intentionally integrated within the care model and function at the top of their scope while allowing the development of the surgical resident into a fully qualified surgeon. Realizing that both APs and residents are on separate career paths and often vie for the same recognition and respect for patient care, the cultural barrier that initially existed between residents and APs caused the Department of Surgery to recognize the need and importance of optimized integration. Therefore, the authors explored methods of how other academic surgical departments have integrated APs with surgical resident-based teams and uncovered a gap in the literature. Studies have addressed AP integration into the profession of medicine and have examined cost of APs, efficacy of APs, attitudes about APs among residents, and educational impact of APs,[12,18–23] but no literature exists that we could find that describes a formalized approach to AP integration into a department of surgery and specifically with AP/resident integration. The purpose of this paper, therefore, is to describe our initiative for developing an operational improvement model for APs working with residents on surgical inpatient services, with the goal being to infuse an enhanced “collaborative care spirit” with which surgical faculty, residents, and APs care for patients as a single coordinated entity.

Our approach towards understanding integration

In 2013, a multidisciplinary Project Team was organized by the Chairman and Vice Chair of Professional Development in the Department of Surgery to glean an initial perspective on the current status of AP integration within resident surgical teams at Indiana University. Members of this team included the Chair of Surgery, the Program Director of the general surgery residency, the Chief Medical Officer, Nursing Administrator Director, and Chief of Advanced Practice and Nursing of the affiliated hospital system, 2 general surgery residents, 3 surgical APs and the Vice Chair of Professional Development. The Project Team met twice as a large group and once in small groups over a three month period. During the first meeting, the purpose of the project team formation was to define current literature and understand resources on best practices about AP and resident integration. These findings were shared, and discussions ensued largely as reactions to the findings and current state of formalized integration of APs and residents. Discussions culminated with the Project Team determining that there exists a real need for improving AP integration within resident teams on surgical inpatient services. At the end of the first meeting, the Project Team identified four components of AP integration to further explore including 1) *training and recruitment of APs in surgery*, 2) *organizational structure and performance evaluation*, 3) *expectations and workflow on resident teams*, and 4) *AP advocacy and professional development*. As an action item, each member of the Project Team was assigned to one of four small working groups (based on 4 components just listed) and given the assignment to address questions accompanying each component (Table 1). The Project Team convened a second time to report on what each small group determined. The notes were collated and a “to do” list was generated to provide a roadmap for conceptualizing an improvement model.

In 2014, shortly after our Project Team met a final time, a survey was sent to all surgery APs [N = 43] to gather baseline information about AP's perceptions on roles, responsibilities, and how well they are integrated with surgery department faculty and residents (Table 2). The response rate was 77%. Results were compiled, reviewed by the authors and then shared with APs during several group meetings and online. Feedback was solicited from APs during the meetings about results of the survey and what practical next steps could be taken to assist with their development and integration. Discussion focused mainly on their desired professional development needs. Consequently, a list of AP self and structured learning activities/topics for knowledge and skill development was devised by the Vice Chair of Professional Development, with assistance from a surgeon colleague (Table 3).

To the 2013–2014 general surgery residency annual program evaluation, two questions were added about AP integration. Residents were asked: 1) *How does working with Advanced Providers (NPs/PAs) impact your job?* and 2) *Where do you feel Advanced Providers fit into the hierarchy of a resident-based surgical team?*. In the faculty version of the annual program evaluation, faculty were asked one question about AP integration: *Where do you feel Advanced Providers (NPs/PAs) fit into the hierarchy of a resident-based team?*. Results of the 3 survey questions were collated, reviewed by the authors and shared with the APs. Most residents responded that APs positively impact their job and are helpful. They also commented that it can depend on the AP, the service, and hospital. A few residents alluded to the existence of competition for procedures between APs and residents as well as APs acting as authoritative figures at times. As for where APs fit into the hierarchy, most of the residents who responded thought APs function at the level of an intern whereas faculty responded at the level of a junior/mid-level resident. Interestingly when the APs were asked in their baseline survey where they feel they fit into the hierarchy of a resident-based surgical team, the majority [N = 12] responded that they are not part of a hierarchy and that they work parallel to residents and answer to staff. Five APs responded high … beneath fellows, superior to residents. Three APs responded low on the totem pole, two responded like an intern/second year, two were unsure, and one AP responded like a PGY 3.

Our operational improvement model and process

Combining the Project Team work and results from AP survey and general surgery residency program evaluations, we formalized an operational improvement plan for AP integration within our department of surgery beginning in the summer of 2014 (Fig. 1). We took a deep dive into how the current state existed for the following four components and strived to advance all four components closer to an improved state.

Recruitment, orientation, & training

We discovered that the current state, prior to our integration initiative, for AP recruitment, orientation, and training was informal and unstructured. Often there was a non-clinical person responsible for hiring APs and no department orientation or formal training process was in place when APs joined their surgery team. To improve upon the hiring and onboarding process for APs, an

Table 1
Components of AP integration and questions Project Team addressed.

Recruitment & Training	◦ What qualities are needed for hiring?
	◦ What training and curricula are needed?
Organization & Evaluation	◦ What does the organizational chart look like?
	◦ What is the reporting mechanism?
	◦ Who evaluates APs on their performance?
Expectations & Work Flow	◦ What are the roles, responsibilities, and expectations for APs and residents?
Advocacy & Development	◦ Who comprises the Advisory Council?
	◦ What are the professional development activities for APs?

experienced AP was appointed to serve as Clinical Director for AP Surgical Specialties and assisted us with developing a formal departmental process. Job descriptions for hospital-based and clinic-based AP positions were created and shared among the department divisions to utilize as a template (Sample job descriptions located in Appendix A). The Clinical Director for AP Surgical Specialties is involved in recruitment, hiring, and retention of all providers. Once an AP is hired, he or she attends a New Faculty/Provider Orientation facilitated by the school of medicine and physician employment administration to gain an understanding of our enterprise in terms of education, research and patient care. The last part of the orientation is designed for APs to go to their department and meet with their physician team liaison, lead business administrator, and/or team lead AP for an orientation to the service. Expectations and checklists are shared with the AP and often the new AP is paired with an experienced AP to shadow for a period of time. Training ensues according to skill and experience level and typically occurs in graduated fashion. The Clinical Director for APs is also active in the orientation process and serves as support for each AP as they navigate through their onboarding. Finally, all new surgery APs hired within the last 12 months are invited to participate in pertinent sessions of the general surgery intern orientation to increase their knowledge and skill development as well as interact with new residents early on.

Organization & performance evaluation

In terms of the current state of organization, we realized that nothing existed on paper that visually informed us as to how surgery APs fit into the department of surgery. To that end, we created

Table 2
Baseline survey questions sent to all surgical APs.

Question	Scale
1. What is your primary service that you work on?	Comment box
2. Do you have clearly defined job responsibilities?	Yes/No
3. What would you say are your general roles/responsibilities on your service?	Comment box
4. What % of your time do you spend on inpatient care?	Comment box
5. What % of time do you spend on outpatient care?	Comment box
6. About how many hours a week do you spend in the OR, if any?	Comment box
7. What activities do you personally bill for?	Comment box
8. How does working with residents impact your job?	Comment box
9. How do you feel you impact resident job performance?	Comment box
10. Where do you feel you fit in to the hierarchy of a surgical resident-based team?	Comment box
11. Looking back on the time when you were first hired as an AP, what training needs did you successfully receive?	Comment box
12. What training needs did you wish you received?	Comment box
13. Who specifically do you report to?	Comment box
14. Do you meet with someone regularly who give you feedback on how you are performing in your job?	Yes/No
15. If so, who do you meet with regularly?	Comment box
16. How often do you receive an evaluation report on your job performance?	Comment box
17. Are you currently being mentored by anyone?	Yes/No
18. Would you desire a formal mentoring system be put in place for all surgery APs?	Yes/Neutral/No
19. What professional development activities have you participated in over the last 2 years?	Comment box
20. Do you meet as a group with other APs? If yes, explain.	Comment box
21. On a scale of 1–10, how satisfied are you with your job?	1-Hate everything about my job, completely unsatisfied; 10-Love everything about my job, completely satisfied

Table 3
List of AP self and structured learning activities/topics for knowledge and skill development.

Self-Learning	Structured
Observe surgeries in OR	Attend orientation to hospital, unit, clinic, daily activities
Study reading material relevant to respective service	Intern with an experienced AP on respective service or similar service
Complete check-off for procedures	Attend weekly classes for new hires
Sit with a radiologist for radiology reviews	ATLS, cadaver labs for procedural training, guided supervision for invasive procedural training
Keep a journal of surgeon management preferences	EMR and proper documentation methods
Make self available to be included in the education/in-service of new medical devices	How to function as an AP both in inpatient and outpatient settings and with working with students/residents/fellows
Specific patient population needs and information	Peer mentorship
	Teaching skills development
	Leadership training
	Radiology review course
	Details about complications to watch for
	How to do H&Ps and consults effectively
	Management of tubes and drains
	Hemodynamic monitoring training
	General description of operations (elective, urgent, emergent)
	General types of operations relevant to respective service
	Preoperative preparations for surgery
	Incisions and closure
	Conduct/sequencing of operations/preventing postoperative complications
	Perioperative antibiotics
	Postoperative nutrition
	Acute respiratory failure/ARDS
	Wound infections
	Fistulas
	Intra-abdominal abscesses
	SIRS/Sepsis/Sepsis Syndrome/Septic Shock
	Need for reoperation
	Recovery at home

an organizational chart for how APs interface with surgery faculty and physician employment administrators (Fig. 2). The hospital physician leader helps oversee integration efforts for all hospital surgery APs. The vice chair for professional development assists with AP integration specific to curriculum, evaluation, professional development, and increased communication. Each physician team liaison troubleshoots any clinical issues and provides APs with formal performance feedback ideally 2–3 times a year. Both the Clinical Director for APs and the Chief of Advanced Practice and Nursing serve as liaisons between the department of surgery and surgery APs to improve integration efforts and help support APs in their roles. Specifically, the Chief of Advanced Practice and Nursing sets vision and mission for APs while the Clinical Director for APs mentors, coaches and advocates for APs. The clinical leadership

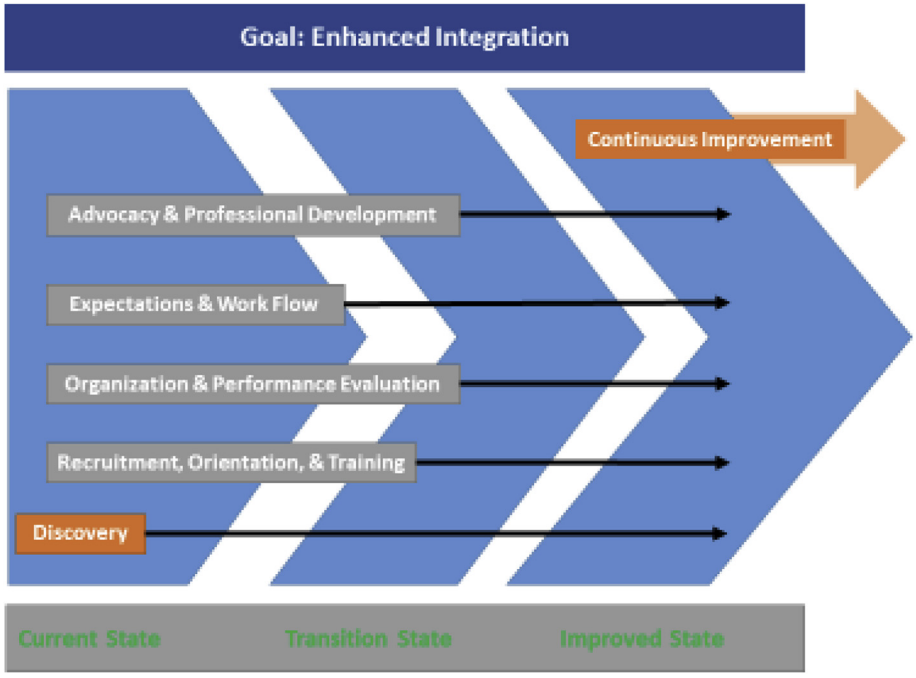

Fig. 1. Operational improvement model for AP integration.

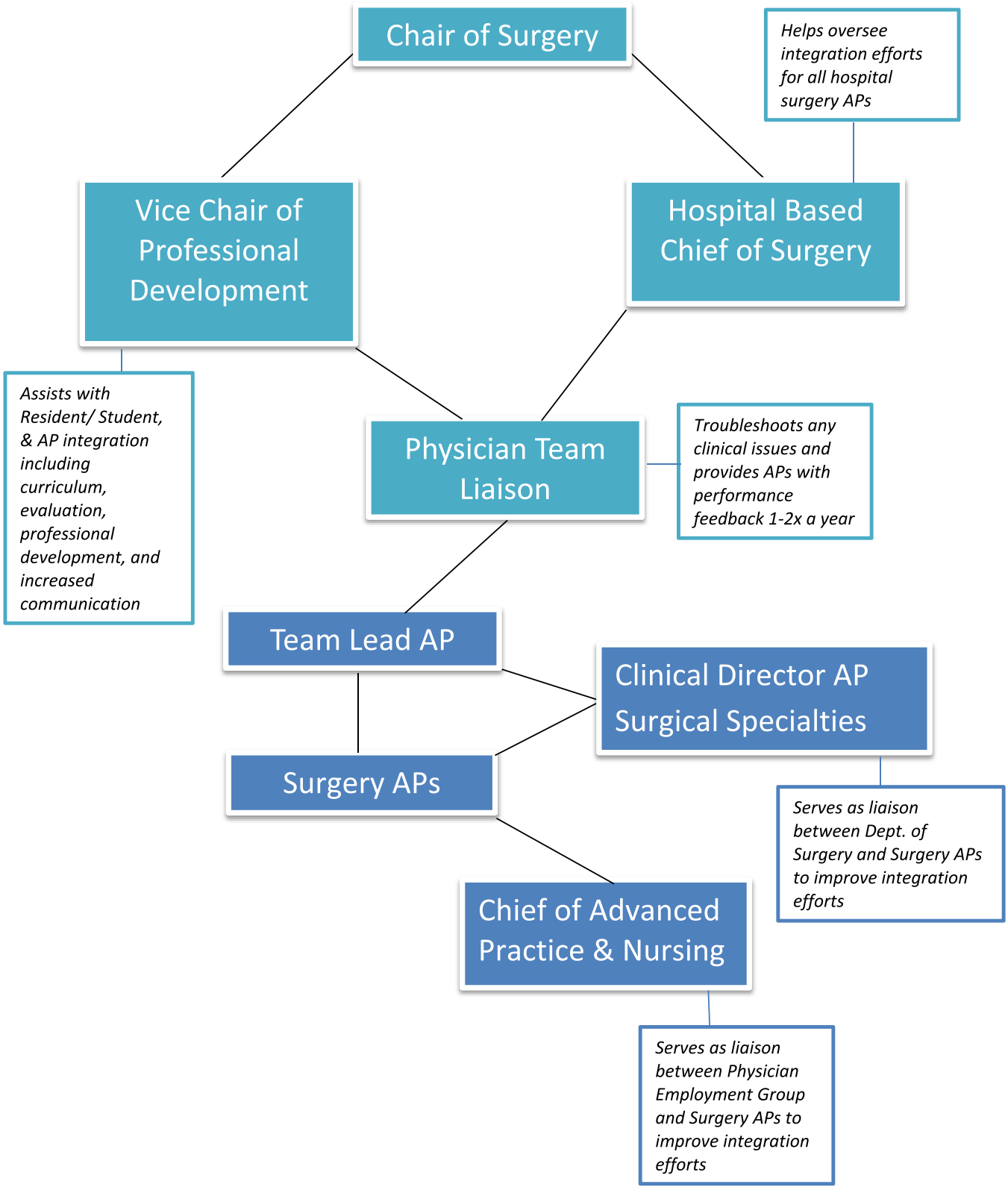

Fig. 2. Department of surgery structure for APs.

support has been the key to success of the surgical APs. The ability to have resources and strong mentorship by both APs and physicians have increased job satisfaction and overall retention.

With regard to performance evaluation, surgery APs were rarely given a formal performance evaluation by surgery attendings. While this has never been a requirement due to the fact that most of our APs are hired by the physician employment group, the APs indicated that occasional feedback on their day to day clinical

performance was desired. APs did report that they receive an annual performance evaluation by their direct supervisor but claimed the evaluation questions and process of evaluation was not very valuable to them. Interestingly, we discovered that for some of the APs, surgery division lead business administrators complete their annual performance evaluation - people having very minimal contact and daily knowledge of how the APs actually perform.

To improve upon the current state of performance evaluation for APs, a new performance evaluation was developed for surgery physician team liaisons to utilize as a way to give feedback to APs on their clinical skills. The form was designed to target how well the APs were meeting their job responsibilities (agreed upon by Project Team) and to supplement the annual review conducted by the AP's direct supervisor [Evaluation form can be found in Appendix A]. Each physician team liaison was made aware of the goal of improving feedback to APs, sent a copy of the evaluation template, and encouraged to complete 2–3 times a year with input from team attendings, chief residents, and team lead AP. While the practice of having division business leaders conduct AP annual performance reviews still exists, we have devoted a portion of two leadership development sessions with the business leaders and the service line lead APs to improve this process within the confines of the physician employment system. Continued improvement is still needed for more meaningful performance evaluation.

Expectations and work flow

Regarding the responsibilities and expectations for both residents and APs, we discovered that the current state was not ideal. Typically, residents and APs learn their responsibilities by experience and direction from chief residents and attendings. Rarely, though, has there been formal education for residents on how to effectively work with APs and for APs on how to effectively work with residents.

To improve upon the collegiality with which residents and APs work and interact, several interventions were made. First, a Resident Education Hour was devoted to learning about both the physician assistant and nurse practitioner professions. The Chief of Advanced Practice and Nursing began the session by giving a brief historical account of how APs began and evolved in medical education up until the current day. She also identified the various training tracks that APs come from along with what each professional can and cannot do within their scope of practice. A surgery PA then gave a brief overview of how PAs are trained followed by a surgery NP informing the residents about the training background for NPs. Both also identified 2–3 things each wished the residents knew about their professions. The session ended with an AP/resident panel discussion whereby residents were free to make comments and ask questions about working with APs, their practice, or their background.

Second, a similar education session was held for surgery APs. The general surgery program director began by giving a brief review of resident training and identified the learning objectives for residents. A resident/AP panel discussion then followed whereby APs were free to make comments and ask questions they had about working with residents.

Third, during each intern orientation we have 1–2 APs talk about their role on the health care team and offer tips and strategies for working with APs and the importance of communication for collaborative patient care.

Related to work flow, the APs identified some frustration when changes to the resident schedule were made (on call, vacation) and they were not informed. To help with increased communication with this issue, the general surgery residency coordinator was given the list of surgery AP emails and every time a new resident schedule was made available and/or switches made, she informed the APs. In fact, the residency coordinator also added the APs to the weekly resident and faculty newsletter and informed the APs when residents would be gone for skills labs and other special events.

Advocacy and professional development

Aside from the AP Leadership Advisory Council and quarterly AP meetings established by the physician employment group, the current state of AP advocacy and professional development within the department of surgery was minimal before beginning our improvement efforts. A mentoring system for APs was in its infancy and APs usually had to seek our professional development within the hospital system or at conferences. We learned that there was no opportunity for surgery APs across the hospital systems to come together to meet one another and develop a local professional network.

Our AP baseline survey data and meetings with APs revealed that they most desired professional development tailored to their knowledge and skill gaps. To improve and engage more APs in professional development, it was decided by the APs and vice chair of professional development to try and meet as a large group three times a year to socialize, check-in about any work issues/concerns related to department of surgery attendings/residents, and offer professional development. Professional development that has been offered thus far to improve knowledge include sessions on: radiology, pain management, acute renal failure, and ultrasound principles. For skill development, we hold a cadaver skills lab and an ultrasound course each year for APs and involve surgery faculty and residents as teachers. The skills we focus on in the cadaver labs are suturing, chest tube insertion, intubation, central lines, and sterile prep. We also try and work on skills that APs identify that are unique to their specialty. For example we had a breast skills session for all of the breast surgery APs. The skills sessions have generated better attendance than the knowledge professional development activities; consequently we consistently offer a cadaver skills lab and an ultrasound course each year and now arrange knowledge based sessions when requested. In the coming year, we hope to arrange teaching development sessions to better equip APs on how to effectively engage with learners and how to serve as a preceptor for AP students in training. A link off of our department of surgery website was created solely for APs to access a repository of resources and material from past professional development sessions.

In addition to the aforementioned professional development sessions, APs are encouraged to attend the department of surgery weekly Morbidity and Mortality conference as well as Grand Rounds to strengthen their knowledge base and enhance their decision making. Finally, a leadership development series was developed for all of the team lead APs. These interactive sessions are held every other month for 60–90 min to help AP leaders reflect on leadership principles and recognize how to better troubleshoot issues they face pertaining to their administrative roles. Topics addressed to date have been the role of emotional intelligence, evaluation performance and feedback, managing conflict, burnout, managing failure, embracing and implementing change, and crucial conversations.

In terms of mentoring, there was a pilot AP mentorship program that began in September of 2016. The intent of the program was to train experienced APs on how to become an effective mentor. The program addressed four key components: program development, effective communication, generational differences, and evaluation process. The experienced AP mentors completed the 4 module session and then completed a self-assessment which included information about experience, location, and communication styles to help with mentee pairings. After novice APs completed their formalized assessment tool, the program coordinator matched each

mentee with a mentor. Three, six and nine month evaluations occurred to assess the relationship and program development. To date, there has been two formalized sessions with 12 mentors and 12 mentees. The goals of the program are to improve networking, provide support, improve engagement, and reduce first-year turnover.

Towards continuous improvement

Our goal with our operational improvement initiative for AP integration was to successfully move from the current state to an improved state for each of the four components in our model. To gain some initial feedback on the progress of our operational improvement process, we sent out a post - intervention survey to all surgery APs one year after the launch of our model. Results showed that 35% of the 20 APs who responded to the survey agreed or strongly agreed that they had received increased feedback about their performance as a surgery AP from their physician team lead. 55% agreed or strongly agreed that they had developed an increased understanding of the training process for surgery residents and 58% agreed or strongly agreed that they had developed an increased understanding of the roles and expectations for surgery residents. Finally, 85% agreed or strongly agreed that they have had increased opportunities for professional development presented to them. From this data and from discussion with key Project Team stakeholders, we believe we have advanced the Recruitment/Orientation/Training and Advocacy/Professional Development components to an improved state and have advanced the Organization/Performance Evaluation and Expectations/Work Flow components, but only to a transition state with more room to improve. To fully advance the latter two components, we need to re-engage the physician team leaders with completing the new performance evaluation form as well as add a resident/AP roles and expectations module to the onboarding curriculum of both professions. Our biggest effort has been focusing on providing opportunities for professional development for APs so we were pleased to discover that our efforts have been recognized. As for recruitment and training, our Clinical Director for APs, along with the physician employment AP recruitment team, have been assets with all stages of recruitment and onboarding to where a formal process is now in existence.

We aspire to advance and continue to advance our integration improvement efforts. In looking at the literature for additional tactics to effectively impact integration, we learned that in 2015 Contrandriopulos et al. published a conceptual model of the best practices and supporting conditions for nurse practitioner integration into primary care teams. Five elements comprised their model's core and included: 1) planning the integration, 2) role definition, 3) patient management, 4) collaboration, and 5) support to the team. The 5 elements that the authors identified closely paralleled our 4 components, especially in terms of planning for integration, having team consensus on AP role definition and scope of practice, and establishing personnel to assist APs with clinical-level, team-level, leadership, and systemic support. Of note, the authors stated that collaboration is essential for optimal patient care and that analysis data suggest NPs greatly appreciate activities involving joint education. We have tried to increase collaboration by encouraging APs to attend surgery education conferences, involving surgery faculty and residents as teachers in AP knowledge and skill development sessions, and inviting all surgery APs each year to the surgery department holiday party. Patient care model was also identified as a core element and while care models did not surface as one of our core components, it is worth considering as there are various models that APs are exposed to in surgery which undoubtedly impact integration.[7]

Implications

High quality patient care necessitates an effective interprofessional working milieu and within surgery, it is important to deliberately integrate APs effectively within resident-based surgical teams. Our department of surgery has increased awareness and visibility of the role of APs and has ensured that they are part of the academic training model. The future physicians who have trained with us will have a clearer understanding of the role, scope of practice, and the value APs bring to the clinical team. Implications for our operational improvement model for AP integration have included increased ability to recruit, hire, and retain providers. The APs feel more valued and integrated in the department of surgery which improves job satisfaction, increased engagement, and reduces first-year turnover. The APs have been given the opportunity to continue to grow their professional careers by receiving advanced surgical training by their peers and surgeon colleagues. Given the progressive increase in Accreditation Council of Graduate Medical Education (ACGME) mandates that restrict resident time at the bedside and in the operating room, development and integration of mature, well trained APs will be essential for the survival of resident training while maintaining the highest standards of patient care. By creating a professional development program for residents, faculty, and surgical APs, all members of the surgical department can feel supported and ultimately improve patient care.

Conflict of interest

No conflict of interest.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.amjsurg.2018.07.013.

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