Hospital medicine is the fastest growing medical specialty in the United States. In 2010, the Society of Hospital Medicine estimated that there were over 28,000 practicing hospitalists in the US with some sources calling for a peak of 30,000–40,000. Over 89% of these hospitalists consist of internal medicine residency graduates; however, only 8% of these graduates enter hospital medicine, not nearly enough volume in flux to meet the growing national demand. In 2010, the average nurse practitioner (NP) full-time equivalent was only 0.23 per hospitalist physician, even after reports of 16% average NP growth in this field. Additionally, the Association of Academic Medical Colleges predicts a significant physician shortage projected to 2025; assuming current use patterns continue, the hospital inpatient setting is projected to experience the greatest rise in demand for services at 36.6%.1

One potential solution to the existing and expanding hospitalist dearth is the use of NPs in the inpatient arena. However, many hospitalist groups have struggled to easily incorporate NPs into the hospitalist model.

**CURRENT STATE OF INPATIENT NP USE**

Although the integration of NPs into hospitalist groups is an appealing option, significant hurdles impede the successful deployment of hospital-based NPs. Most NP training focuses largely on the promotion of health and the management of chronic disease, primarily in the outpatient setting. Although inpatient training is offered, mostly to acute care nurse practitioners (ACNPs), finding NPs with sufficient inpatient training and experience remains a challenge. Because physician hospitalists often have limited acquaintance with NP training and skill sets, a substantial challenge lies in understanding the NP scope of care, which can vary considerably.2

Although ACNP training focuses on the management of acutely ill patients across care settings including the hospital, it is only the 5th most common NP specialty area falling below family, adult, and pediatric, all of which are represented in the inpatient setting in the literature. In a recent survey of ACNP practice settings,3 less than 15% described their practice setting as “inpatient hospitalist team,” meaning that among those NPs with inpatient-specific training, only a small number of them currently practice in the hospitalist model. Therefore, the need for additional inpatient training and experience for NPs with family-, adult-, geriatric-, or pediatric-specific training is well supported.

Among a national sample of academic medical centers surveyed, 42% reported using NPs on hospitalist teams.4 These academic medical centers showed added value with the use of hospital-based NPs by enabling improvements in patient safety initiatives, improving continuity of care, and increasing physician productivity, among other reasons. Multidisciplinary hospitalist physician and NP teams in academic centers have shown a reduced length of stay and increased hospital profit without the unintended consequences of readmission or mortality.5 Meta-analysis review of the literature shows that in a supportive environment, the incorporation of NPs into an inpatient medical team model can improve patient care, enhance care team communication, and decrease the cost of care.6 All of the included studies used acute care—trained NPs, primarily in the intensive care unit and emergency arenas. The success of these models is likely transferable to the general inpatient settings.
THE CASE FOR EXPANDED NP TRAINING

In a 2007 survey of 562 NPs, only 10% of new graduates reported being “very well prepared” for clinical practice. In fact, half of the surveyed sample believed that they were only “somewhat” or “minimally” prepared to enter practice as an NP. Eighty-seven percent of the respondents expressed an interest in pursuing a “residency program of supervised clinical training” had one been available to them after their NP training. The expressed interest of NP graduates in additional training, the necessary growth of the hospitalist model, and the need for additional inpatient care providers create the ideal environment to foster NP hospital medicine training programs.

BACKGROUND FOR AN NP HOSPITAL MEDICINE FELLOWSHIP

The University of Colorado is an academic medical center consisting of over 400 inpatient beds and is the home to the Hospital Medicine Group. This group consists of approximately 30 physicians, 2 physician assistants (PAs), 3 NPs, and up to 6 NP fellows and is broadly ensconced in many areas of patient care, including inpatient geriatrics, oncology, neurology, consultative, and perioperative medicine and resident and nonresident general medical services.

At the University of Colorado, NPs have become invaluable members of several inpatient teams by helping provide care to the growing patient population. Over the years, there has been a steady growth in NP employment, in part because of resident work hour limitations as well as volume growth within the institution. However, challenges with the use of NPs are apparent and mirror the issues observed at the national level. NPs are used in a myriad of ways, often with divergent job descriptions and with unclear scope of practice expectations. Additionally, hiring new NPs presents the challenge of finding candidates with sufficient training and experience in the inpatient setting.

The Advanced Practice Fellowship (APF) at the University of Colorado attempts to overcome these challenges by providing the clinical and nonclinical training necessary for success in the hospital setting, standardizing the curriculum and expectations, and providing the bedrock necessary for NPs to function as confident inpatient providers. The fellowship focuses on providing practical and necessary knowledge, skills, and attitudes. Additionally, the fellowship strives to empower NPs to define a more satisfying and sustainable role in the inpatient arena.

PROGRAM DESCRIPTION

The APF began in January 2009 and currently accepts 6 fellows per year. Given the program’s initial success and because of increasing interest, PAs were added to the application pool in 2011. Applicants must be a graduate of an accredited NP or PA training program and must acquire national certification before commencing. Historically, applicants have represented many of the various NP specialties, particularly primary care (adult, family, and geriatrics). After completion of the 12-month fellowship, the fellow receives a certificate of achievement and invaluable clinical experience.

The APF strives to improve clinical competency and increase NP confidence in caring for adult inpatients while encouraging these providers to work independently in conjunction with a collaborating physician. The program also aims to introduce the fellows to the nonclinical tenets of hospital medicine, such as continuous quality improvement, process enhancement, and resource use. The educational framework relies on the foundation of building medical knowledge, skill in communication, and professional development to help the learner achieve clinical excellence (Figure). These objectives are accomplished by a curriculum that includes clinical rotations, didactic instruction, and scholarly activity.

Figure. Educational framework of the Advanced Practice Fellowship.
Ultimately, the graduate will become a nurse leader able to comfortably provide quality patient care in an inpatient setting.

**METHODS**

**Clinical Rotations**

NP fellows spend the majority of their clinical time on the Hospital Medicine Service, a nonresident service composed of general medical patients. The service is staffed by physicians, PAs, NPs, and NP fellows. To build NP competence with high patient volumes, the clinical obligations build in a stepwise manner, increasing steadily. This clinical ramp-up is offset by a linear decrease in the amount of didactic teaching such that the early focus is on didactic learning, whereas the latter focus is on experiential learning.

Additionally, the fellows spend clinical time on other hospitalist-run services within the institution to broaden the clinical experience and provide exposure to other facets of hospital medicine. These rotations include perioperative and consultative medicine, palliative care, geriatric medicine, oncology, and infectious disease. Additionally, the fellows rotate on evening and night services with a focus on the admission of new emergency room patients, transitions of care, and cross-cover medicine.

**Didactic Instruction**

The didactic curriculum begins with a 2-week boot camp designed to provide a foundation of knowledge, skills, and attitudes for the fellow. Building on the core topics, the fellow receives several didactic lessons per week including case studies designed to inspire the formation of a differential diagnosis and clinical decision making about the topics.

**Hospital Systems**

One of the major goals of the APF is the development of skills to become agents of change. Across the country, hospitalists are increasingly involved in patient safety, quality, and efficiency initiatives. As health care continues to evolve, it is clear that an understanding of hospital systems and quality assessment is fundamentally necessary. Beyond simply teaching the clinical skills of hospital practice, the APF strives to instill the knowledge and desire to improve quality, safety, and efficiency (Table).

**Evaluation**

The APF uses a multisource feedback and evaluation process including input from nursing, faculty, and case management as well as NP fellow self-assessment. Additionally, the fellows’ performance is assessed using module quizzes and case studies to assess improvement in overall clinical skill and medical knowledge.

NP fellows undergo baseline knowledge assessment before the start of the fellowship using a multiple choice question (MCQ) examination. The use of standardized patient encounters adds a baseline assessment of basic communication and clinical skills. Once clinically involved, standardized direct

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NP = nurse practitioner; PA = physician assistant; SHM = Society of Hospital Medicine.
observation is used to chart NP fellow progress in focused physical examination completion, history and physical documentation, and writing thorough admission orders. A final exit MCQ is completed at the end of the fellowship.

OUTCOMES
Since its inception, the APF has graduated a total of 8 fellows with an additional 5 current fellows in various stages of completion. Of our graduates, 75% initially chose jobs in an inpatient setting, with 80% obtaining their first choice in jobs. Feedback from the postgraduation survey shows that 100% of fellows initially felt “very unprepared” or “unprepared” to care for a hospitalized adult patient before starting the fellowship. After completion of the fellowship, 80% felt “prepared” and 20% felt “very prepared” to care for inpatients, and all were able to easily find employment after the fellowship. All fellows take a clinical medicine MCQ test before and after their fellowship, with dramatic improvement in overall scores, from a mean of 57% correct before fellowship to a mean of 79% correct after fellowship.

DISCUSSION AND FUTURE DIRECTIONS
Funding can be a major hurdle in the creation of an NP fellowship program. The assessment of departmental needs as well as commitment from departmental and hospital leadership and stakeholders are keys to obtaining financial buy in. Although strategies will need to be local suggestions, these may include tying the training to hospitalist physician promotion and job descriptions, tailoring solutions to address specific hospital clinical needs, and leveraging the need for an increased number of trained NP providers. Hospital administrators may view this as an opportunity to expand or create new service lines, recruit strong physician faculty that enjoy the teaching role, and improve operational efficiency and quality on existing services.

A review of the literature reveals high variability in the roles of NPs in inpatient settings. The increasing demands for additional hospitalist providers cannot overshadow the importance of identifying the best roles and responsibilities for NPs in providing high-quality inpatient care. This necessitates a commitment from the NP profession to assist in describing and standardizing the competencies for inpatient care across all NP specialties.

An additional challenge to the APF is the impact of the advanced practice registered nurse (APRN) Consensus Model and the Licensure, Accreditation, Certification and Education implementation mechanism. Briefly, the Consensus Model works to identify appropriate advanced practice titles, define specialties more clearly, and anticipate and describe how new roles and patient populations will be handled. From a practical perspective, the Consensus Model states that primary care trained NPs, adult NPs, and family NPs, are not appropriately trained to practice in an acute care realm. Moreover, the model goes further by stating that postgraduate programs, such as the APF, cannot fill this role for primary care trained APRNs. To address this issue, the APF is working with the University of Colorado College of Nursing postgraduate ACNP training program to allow primary care trained APRNs to simultaneously complete the fellowship and obtain ACNP certification.

SUMMARY
The growing field of hospital medicine, the expanding physician shortage, and the increased demand for high-quality inpatient care have created the ideal environment for the expansion of inpatient roles for NPs, both acute care and primary trained. The APF in hospital medicine represents the first reported program of its kind in the US aimed at providing the educational foundation necessary to create strong multidisciplinary inpatient care teams. We believe that through the provision of high-quality training, NPs have the opportunity to advance the safety, effectiveness, and overall quality of inpatient care.

References


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