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## SPECIAL SECTION ON NON-PHYSICIAN ICU PROVIDERS

# Evolution of Critical Care Nurse Practitioner Role Within a US Academic Medical Center

Thomas L. Farley, MS, ACNP, and Geoffrey Latham, MS, ACNP

**Abstract:** Nurse practitioners are becoming established clinicians in the intensive care unit. This article describes the integration of nurse practitioners into the Critical Care Medicine Service at the University of California San Francisco Medical Center. The development and current form of the nurse practitioner role is detailed. The model of employing nurse practitioners in an academic critical care medicine service is provided as a blueprint for other institutions facing a shortage of intensivists. This study addresses future direction for program development.

**Keywords:** nurse practitioner, acute care nurse practitioner, critical care, intensive care, academic

Several factors are currently contributing to an imbalance of the supply and demand of intensivists. Factors decreasing supply include a reduction in number of physician trainees concurrent with a reduction in allowable weekly work hours for physician trainees.<sup>1,2</sup> Factors increasing demand include an understanding that intensivists improve outcomes, an aging population, and a greater overall demand for critical care services.<sup>3-5</sup> This situation has resulted in new opportunities for nurse practitioners.<sup>6-8</sup>

Nurse practitioners (NPs) are well established in the primary care setting. Now NPs have expanded into the hospital setting with a new national certification specialty, acute care.<sup>7,9-11</sup> In 2009 in the United States, approximately 15% of the advance practice nursing national certifications were in acute care.<sup>12</sup> A recent survey indicated that approximately 15% of NPs in the United States are practicing at an inpatient setting as acute care NPs.<sup>13</sup>

Hospitals in the United States, the United Kingdom, and the Netherlands are now using acute care NPs in the critical care setting.<sup>14</sup> Most commonly, the NPs are part of a surgical or medical service that is admitting patients into a critical care setting.<sup>1,7</sup> There is evidence that NPs practicing in the ICU are safe, effective, and cost saving.<sup>7,15-19</sup> However, there is a shortage

of descriptions detailing the successful integration of nurse practitioner into an academic critical care medicine service.<sup>7</sup>

## University of California San Francisco Critical Care Medicine Service

Our center employs NPs as members of our dedicated critical care medicine service. The focus of this article is to describe how NPs were integrated into a critical medicine teaching service at an academic medical center. University of California San Francisco (UCSF) Medical Center is a 500-bed academic tertiary

care medical facility that is a referral center for northern and central California. In total, there are 5 physically disparate adult ICUs with 76 adult critical care beds. Each adult ICU has

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a specialty focus. The foci are medical–surgical, cardiothoracic, or neurological–neurosurgical.

Our critical care medicine service is composed of 4 separate multidisciplinary teams that consult on patients when admitted to the ICU. Each team is responsible for a specific ICU. The ICU teams at UCSF are composed of an attending physician, clinical fellows, residents, NPs, a pharmacist, medical students, and NP students. Each team is assigned a specific ICU with one team responsible for 2 physical ICUs. Admitting services to the ICUs include all disciplines of surgery and internal medicine. The adult ICUs at UCSF are a blend of the traditional comanagement and closed models. A majority of the patients are managed with the comanagement model where the ICU team provides a comprehensive critical care consult, in addition to the ventilator management, vascular access, analgesia, and sedation management. This consult is an essential component of their service, applying evidence-based practice and identifying opportunities for improved care. Selected services such as oncology, urology, orthopedics, and OHNS (otolaryngology head and neck surgery) have adopted a closed model for their patients.

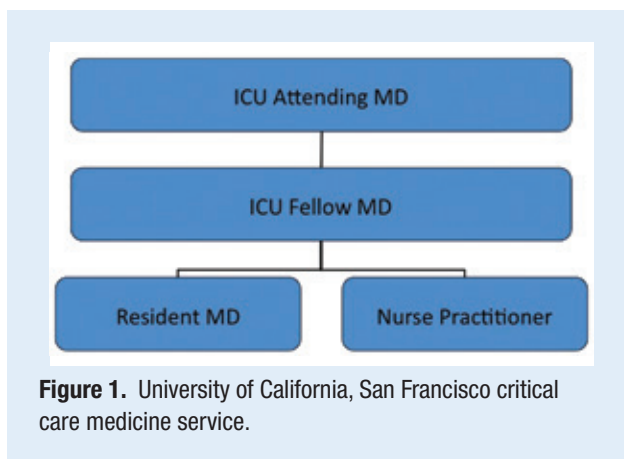
### Advent of Critical Care Nurse Practitioner Role at UCSF

Nurse practitioners were initially recruited for the critical care medicine group in 2004. The initial recruitment of NPs was primarily triggered by the opening of a new 16-bed ICU, without any expansion of the teaching programs that provided residents for ICU service and education. The work demands had outstripped the physician labor supply. It was clear that with no additional house staff available, using allied health professionals would be necessary. The ICU medical director collaborated with the department of nursing to recruit NPs. Although physician assistants were considered, NPs were felt to be more desirable for the role. This was largely because of the close ties between the medical center and the UCSF School of Nursing, the desire for the new providers to have a strong ICU clinical background, and the hope that NPs would collaborate efficiently with the existing registered nurse staff.

Initially, 3 NPs were recruited for one ICU team. There was little strategy on how to integrate NPs into the service. They operated mainly as an adjunct to the ICU resident. Initial training was informal and focused mainly on learning while practicing. The role of the ICU NPs has greatly evolved over the past 6 years.

### Current Role of the Critical Care Nurse Practitioner

The NP practice now employs 13 individuals. The NPs rotate through the entire roster of adult ICUs with the exception of one medical surgical unit. There are several reasons for this omission: fostering NP practice unity by clustering most of the NPs on one team, to maintain one service with the traditional attending/fellow/resident/student model, and the already



**Figure 1.** University of California, San Francisco critical care medicine service.

complex call schedule that is required for all 5 ICUs. The remaining 4 ICUs have a call schedule that is staffed with residents and NPs. NPs work 12-hour shifts 3 days per week. They rotate through day and night shifts, providing comprehensive annual coverage.

Continuity of care is a fundamental goal of the service. However, because of the complex resident call schedule, sometimes an individual NP will not staff the same ICU on successive days. Patient data and plans of care are recorded on a secure database and updated frequently. This database is an invaluable tool for communicating information from clinician to clinician. In addition, a face-to-face handover sign-out takes place between all clinicians to provide an opportunity for clarification of data.

### Supervision, Collaboration, and Training

Supervision of NP practice in the state of California is mandated by statute.<sup>20</sup> The vehicle that provides for collaboration and supervision is the standardized procedure. The written standardized procedure ensures that the statutes of the California Board of Registered Nursing are followed. Each NP has a supervising physician of record. Day-to-day supervision is provided formally by the team's attending service physician and informally by the clinical fellows (Figure 1).

In our institution, clinical supervision is distinct from administrative supervision. For the critical care service, NPs are hired and employed by the Department of Nursing. There is a lead NP of our group who acts as an administrative supervisor and liaison between the NP group and the hospital administration. There is no individual salary or benefit negotiation since all nurses at the medical center are covered under a collective bargaining agreement. Billing for NP evaluation, management, and procedures is not currently performed at UCSF. The Centers for Medicare and Medicaid Services does reimburse nonphysician providers for critical care evaluation and management.<sup>21</sup> This is a complex topic and other authors have described it efficiently.<sup>22</sup> However, the primary medical group at the UCSF Medical Center currently will not credential nonphysician

providers to provide critical care services for their members. Thus, the medical center has decided not to perform billing for any NP critical care services.

Formal hiring criteria were developed when the critical care NP practice began to expand from the initial 3 individuals. The minimum criteria are California RN/NP licensure, master's degree, certification in acute care by a recognized national certification organization, and at least 2 years experience in critical care either as an RN or an NP. All members of the group had RN experience in critical care prior to becoming NPs. Approximately half of the current NP group had previous experience as a NP when hired. The balance had just completed their educational training. None of the original 3 NPs had experience as NPs when hired. Although it is not a condition for hiring, all the NPs in our practice are certified in acute care. There is an understanding that acute care NPs have the educational background best suited to caring for critically ill adults.<sup>7,14,23</sup> Privileges to practice are renewed every 2 years. The application process is governed by requirements listed in the California Board of Registered Nursing<sup>20</sup> and overseen by the UCSF medical staff office.<sup>24</sup>

### Initial and Ongoing Competency

Initial procedural competency is acquired by performing three procedures under the direct supervision of an attending physician. Ongoing competency is maintained by performing 5 procedures per year for vascular access and conscious sedation. The number of intubations required per year is 10. Procedures and complications are tracked with a Web-based log. Complications resulting in morbidity are discussed in the monthly morbidity and mortality conference.

An hourly morning conference is held 5 days per week and cycles every month. The topics are focused on core critical care concepts. The major goal of this conference is to provide structured education for the residents and fellows. Newly hired NPs work shortened days for the first month with the goal of attending a full cycle of conferences. They are paired up with experienced NPs who mentor them through the first month. Three- and 6-month evaluations are performed with the goal of assessing readiness for working the night shift. The night shift is where the NP must independently apply clinical knowledge and skills. Normally new hires are not expected to work the night shift for the first 3 months.

### Core Nurse Practitioner Duties

Critical care NPs at UCSF have many important duties (Table 1) and perform several procedures (Table 2). However, the most crucial duties involve ventilator management, sedation, pain management, vascular access, and ICU care bundles. These crucial duties comprise a majority of the clinical decision-making tasks. Collaboration with the attending physician and clinical fellow is encouraged. There is a high level of autonomy and trust given to the nurse practitioners especially during the less thoroughly staffed night and weekend shifts. This is congruent with published reports that NPs enjoy

**Table 1.** Duties Performed by ICU Nurse Practitioners

History taking and physical exams
Entering admission histories and physical into the electronic medical record (EMR)
Entering daily progress notes into the EMR
Writing admission orders and routine orders
Rounding with the critical care team and presenting patients
Implementing proven care bundles (early mobilization, deep vein thrombosis prophylaxis)
Consultative role to admitting services
Consultative role to bedside registered nurses
Guidance of house staff
Responding to code blue activations
Assisting with rapid response consultations
Serving on hospital-wide multidisciplinary committees
Precepting acute care nurse practitioner students
Attending morning teaching and monthly morbidity and mortality conferences

**Table 2.** Procedures Performed by ICU Nurse Practitioners

Performing peripheral and central vein cannulation with bedside ultrasound
Performing arterial cannulation with bedside ultrasound
Endotracheal intubation
Conscious/procedural sedation

autonomy.<sup>25,26</sup> A clinical fellow is available in-house 24 hours a day and available to the NP for consultation.

A key role of the NPs is to serve as a clinical resource for the residents and fellows who rotate through the critical care medicine service. The NPs participate in daily rounds by presenting patients in the traditional format. They are encouraged to independently research unfamiliar clinical topics and share relevant information. The NPs assist the clinical fellows, residents, and students with challenging patient care scenarios. This informal teaching outside of the traditional Socratic method often provides the house staff with knowledge that is

learned only with experience. Several NPs have been in the role at UCSF for more than 5 years. They possess a large body of knowledge of how to efficiently use the resources in a large academic medical center. Written evaluations from the residents list the NPs as a helpful and respected resource.

## The Future

We expect that expanding medical centers will be adding additional adult critical care beds. NPs trained in the management of critically ill adults may be a way to provide intensivist coverage. Additional restrictions to resident work hour limits will decrease the number of resident physicians available to academic critical care programs. The NP group at UCSF is prepared to meet these staffing needs by maintaining a strong relationship with the UCSF School of Nursing. This relationship allows UCSF NPs to play a direct role in the development of the next generation of acute care NPs. It is important for hospitals to seek out schools of nursing with which to collaborate.

Research and dissemination of information through publications are necessary to examine and promulgate effective use of critical care NPs. Our group has found it challenging to devote time to scholarly endeavors when the primary job focus is clinical care. A solution to this issue is to financially support time for nurse practitioner research. Job descriptions should include expectations of scholarly work.

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