

## Clinical practice characteristics of gerontological nurse practitioners: A national study

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### **Abstract:**

**Purpose:** To determine the clinical practice characteristics of gerontological nurse practitioners (GNPs) in the United States and ascertain whether length of employment, geographic region of practice, work setting, and educational preparation influence GNPs' delivery of advanced clinical services and clinical procedures.

**Data sources:** The Gerontological Nurse Practitioner Practice Profile was mailed to a stratified random sample of 1000 GNPs certified by the American Nurses Credentialing Center.

**Conclusions:** Despite the growing demands for GNPs, of the 472 GNPs who responded to the survey, only half were working full-time as a GNP. Although the role was established over 30 years ago, 56% of the respondents indicated that they were the first GNP in the position. There was a statistically significant positive relationship between being the first GNP in his or her practice and the percent of primarily medical advanced clinical services performed. GNPs who worked in multiple clinical setting performed more advanced clinical services and medical procedures than GNPs who only worked in one setting.

**Implications for practice:** This study provides insight into the complex practice characteristics of GNPs. GNPs are combining the nursing skills so necessary to care for older adults with advanced clinical services and clinical procedures deemed medical acts. Various factors influence how GNPs practice, including geographic location, type of practice, and whether the GNP was the first person to be employed as a nurse practitioner at the practice.

**Keywords:** Gerontological nurse practitioners; practice settings; advanced clinical services; clinical procedures.

### **Article:**

#### **Introduction**

The first nurse practitioner program was established in the United States in 1965; the gerontological nurse practitioner (GNP), however, did not emerge until a decade later (Ebersole, 1985). Early research on GNPs focused on the impact of GNPs in long-term care (Buchanan et al., 1989; Burl, Bonner, Rao, & Khan, 1998; Ryden et al., 2000). Kleinman (1990), who examined the employment settings, role functions, and job satisfaction of 562 GNPs, found that although certified as a GNP, only 63% of the respondents were working in the field of gerontological nursing. Kleinman found that these GNPs were primarily employed in ambulatory care settings or long-term care facilities, and 25% of the respondents indicated that they worked in more than one clinical setting. Seventy percent of the respondents noted that they were the first GNP in the position. The participants in Kleinman's study reported various tasks performed: health education and history being the two most common. Role responsibilities of GNPs consisted primarily of direct patient care, followed by care coordination, with research a minimal role. More recent studies pertaining to nurse practitioner practice trends reported similar findings; however, the percentage of GNPs participating in these studies was reported to be fewer than 8% (Goolsby, 2005; Pulcini & Vampola, 2000).

Despite the current demand for GNPs (Fulmer, Flaherty, & Medley, 2001), there is a paucity of information on the role of the GNP. This national study was conducted to examine the multifaceted practice characteristics of

GNPs in the United States. The study examined the geographic locations of practice, practice settings, and overall practice responsibilities of GNP. In addition, the study looked at whether GNP have a tendency to practice more nursing functions or medical acts and whether length of employment, geographic region of practice, work settings, or educational preparation influence the practice of clinical procedures and delivery of advanced clinical services.

The conceptual framework used to guide the study was derived from the work of Burr and Rogers proposed by Garland and Marchione (1982). Garland and Marchione suggest systematically reviewing the body of knowledge that exists about the role of the nurse practitioner considering three different levels of analysis in interpreting findings. The society/institutional level defines how general social norms affect the role of the nurse practitioner; the group/interaction level addresses social role development occurring during interactions; and the individual/ psychological level of analysis allows one to examine various levels of individual initiative, depending in part on the individual's perception. Garland and Marchione suggest that the interpretation of role theory can "guide future researchers in their efforts to understand the factors affecting the role of the nurse practitioner" (p. 23).

### **Research methods**

This study used a descriptive, correlational design, and cross sectional, survey methodology. At the time the study was conducted, there were 3456 GNP certified by the American Nurses Credentialing Center (ANCC). From the target population, a stratified, random sample of 1000 was selected. The sample was stratified based on membership in the National Conference of Gerontological Nurse Practitioners (NCGNPs). The proportion of members to nonmembers being 25:75, 75% of the sample was selected from the nonmember list and 25 % were identified NC GNP members. Institutional Review Board approval for the study was obtained. Participants were mailed a personalized cover letter and the Gerontological Nurse Practitioner Profile Questionnaire. Return of the stamped, preaddressed envelope with a completed questionnaire was considered to constitute consent to participate. Confidentiality and anonymity were assured because no identifying data were requested on the survey.

Of the 250 packets mailed to NCGNP members, 201 usable surveys were returned (80% return rate). There were 750 nonmembers in the sample from which 271 usable surveys were received (36% return rate). In all, of the 1000 packets mailed, we received 472 usable surveys (47% overall return rate).

### **Survey instrument**

The Gerontological Nurse Practitioner Profile was developed by the researchers to examine practice characteristics of GNP. The instrument was derived from an extensive review of the literature on role characteristics of nurse practitioners (Kinney, Hawkins & Hudson, 1997; Towers, 1989) and GNP effectiveness (Dietrich, Chambers, & Resnik, 1990; Kane et al., 1988; Radosevich et al., 1990). The instrument was reviewed by a panel of experts to establish initial content validity. The panel consisted of a statistician, a nurse researcher with expertise in tool design, and three doctorally prepared GNP. The original tool was pilot tested by a randomly selected group of 150 NCGNP members who were certified GNP. Minor adjustments were made within the tool, and some areas were expanded to request additional information about practice characteristics and GNP's professional development needs.

The instrument was an 18-page, 204-item, self-administered questionnaire with fixed-choice and one open-ended question allowing participants to share additional information about their practices. The questionnaire contained six sections. The first section requested basic demographic information, including age, gender, and ethnicity. The second section asked about educational background, nursing experience, and certification. The third section gathered information about professional memberships, attendance of professional meetings, and continuing education needs. Section four contained a variety of questions about current GNP practice, including practice settings, prescriptive privileges, billing, type of practice, and practice requirements. The first part of the fifth section listed 17 advanced clinical service activities that nurse practitioners typically provide in their practice (see Table 4). GNP were asked to rate the importance of each service in their practice and indicate

how often they performed the service in practice. These services were categorized as skills deemed either nursing (ones that could be performed within the scope of a registered nurse) or medical (performed by a health care provider with advanced preparation and approval to practice) or both (indicating that a registered nurse or a health care provider with advanced training could provide). The second part of Section five listed 31 clinical procedures physically performed by a nurse practitioner and deemed generally nursing or medical or both (see Table 5). For each procedure, the GNP's were asked if they performed/provided, ordered/referred, or neither. In addition, they were asked to identify the source of their original training for each procedure: basic RN education, NP program, workshop, or on-the-job training. The final section of the survey requested frequencies of how often specific medication classes, such as analgesics, cardiovascular drugs, and antidepressants, were prescribed in their practice (Kennedy-Malone, Fleming, & Penny, 2008).

### **Statistical analyses**

Data were analyzed using the SAS statistical software package. Descriptive statistics were used to identify information about the entire sample of GNP's who responded to the survey and to summarize information about practice characteristics of these GNP's.

To examine the effects of specific factors on GNP practice, we needed to control for the amount of time in direct patient care. To do so, we selected a subsample of GNP's who were currently practicing full-time (defined as 35 h or more per week) in direct patient care. This subsample of 234 GNP's was similar to the full sample in demographic characteristics, educational preparation, and certification.

For analyses of the effects of specific factors, we considered two spheres of potential influences: (a) educational preparation and work experience and (b) work setting characteristics. To analyze the effects of the potential influences on GNP practice variables, we used a combination of chi-square analyses, *t*-tests, and correlations. We controlled for experimentwise error within each of the two spheres.

## **Results**

### ***Sample characteristics***

The 472 respondents were primarily Caucasian females, with an average age of 48 (range from 27 to 74). About three fourths (74%) of all respondents were in their forties or fifties. About half (52%) of the respondents received their basic RN education at the bachelor's level. A few (5 %) became RNs after a master's degree in another area of study. The rest were evenly split between an associate degree program (21%) and a diploma program (23%) as their entry level. Of note, 95% had earned at least a master's degree. The respondents ranged from new graduates to GNP's who had completed their nurse practitioner education 30 years ago; the average time since completion of their GNP education was 8.7 years. Respondents had obtained their NP education primarily through a master's program (75%) while other avenues listed were a postmaster's certificate (15%), a certificate program (8%), or some combination of these (3%). About two thirds of the respondents specialized as a GNP; others were educated as family NPs (5%), adult NPs (11%), a combination of GNP and another specialty (17%), or some other specialty area (2%). On average, these GNP's had 14 years of experience as an RN prior to becoming a nurse practitioner and about 8 years of experience as an NP. Our sample was stratified on membership in NCGNP and 80% of the respondents held memberships in that organization. In addition to NC GNP, membership in other professional organizations included the American Nurses Association (41%), followed by American Academy of Nurse Practitioners (25%), American College of Nurse Practitioners (12%), and National Association of Directors of Nursing Administration (2%). Two thirds of respondents belonged to two or more organizations; another 23% belong to only one professional organization and 12 % of the respondents claimed to belong to no professional organization (see Table 1).

Only 387 (82%) of the respondents indicated that they were currently practicing as a GNP. The rest of the survey concerned current practice. Only actively practicing GNP's completed the remaining sections. It is important to note that participation in the study required national certification as a GNP as the main eligibility criteria; thus, a respondent could *still* be certified as a GNP but not currently practicing in the role.

**Table 1** Demographic characteristics of GNPs responding to national survey (N = 472)

Characteristic	n	%
Gender		
Female	451	97
Male	16	3
Ethnic origin		
White/non-Hispanic	424	91
Asian/Pacific Islander	16	3
Black	10	2
Other	15	3
Age (years)		
20–29	7	7
30–39	80	17
40–49	185	40
50–59	157	34
60 and older	36	36
Mean = 47.5		
Range = 27–74		
Basic RN education		
ADN	96	21
Diploma	107	23
BSN	242	52
Generic masters	21	5
Type of NP education		
Master's	349	75
Post-master's certificate	68	15
Certificate	35	8
Combinations of above	13	3
Years experience as RN prior to NP		
≤5	87	19
6–10	96	21
11–20	172	37
21–30	98	21
>30	10	2
Mean = 14.0		
Range = 0–36		
Years experience as NP		
≤5	190	41
6–10	142	31
11–20	104	22
>20	28	6
Mean = 8.3		
Range = 0–36		
Currently practicing as GNP		
Yes	387	82
No	85	18

**Table 2** Selected practice characteristics of GNPs in current practice (N = 387)

Characteristic	n	%
Region of United States		
Northeast	93	24
South	133	34
Midwest	104	27
West	56	15
Type of area		
Urban	225	59
Suburban	69	18
Small city/rural	85	22
Relationship with practice physicians		
Collaborative	317	82
Supervised	18	5
Independent	47	12
Combinations of above	5	1
First GNP at principal practice?		
Yes	212	56
No	167	44
Principal practice government funded		
Yes	222	58
No	161	42
Type of practice		
Hospital	64	22
Long-term care facility	158	54
Office	48	16
Center or clinic	12	4
Other	11	4
Number of principal practice settings		
One	183	55
Two	85	26
Three or more	64	19
Have prescriptive privileges		
Yes	360	93
No	27	7
Have DEA number		
Yes	226	59
No	160	41
Have Medicare UPIN number		
Yes	271	72
No	107	28

### Practice characteristics

Respondents were practicing in 42 states and the District of Columbia. They were fairly evenly distributed across the country based on regions defined by the U.S. Census Bureau: with 24% practicing in the Northeast, 27% practicing in the Midwest, 34% practicing in the South, and 15% in the West. Most of the respondents (59%) practiced in an urban area while 18% practiced in suburban areas and 22% practiced in small cities or rural areas. When asked to describe the relationship with physicians in their principal practice setting, 82% selected *collaborative*, 5% said they were *supervised*, and 12 % were in an *independent* practice. Over half of the respondents (56%) said they were the first GNP at their practice (see Table 2).

Only 21% of respondents had hospital admitting privileges in their current practice, but two thirds had nursing home privileges. Almost half (41 %) said they made house calls or home visits as part of their practice. Few were required to take after-hours calls: two thirds never took call and only 15% took after-hours calls *often* or

frequently. Virtually all the GNPs (93%) stated that they had prescriptive privileges, but only 59% currently had a Drug Enforcement Agency (DEA) number. About three fourths (72%) had a current Medicare UPIN number.

While a little over half of the respondents (55%) spent all their time at a single practice setting, the others worked in two (26%) or more (19%) settings. A fourth (24%) had both a primary practice and a secondary practice. On average, those surveyed were working 36 h per week at

their principal practice and some were also working an additional 12 h per week at a secondary practice. Half of the respondents (54%) spent the majority of their time at a long-term care facility; others spent most of their time in a hospital (22%), office (16%), a center or clinic (4%), or another type of setting (4%). Table 3 shows the percentage of GNPs working some amount of time in different types of settings.

**Table 3** Percentage of currently practicing GNPs working in various settings<sup>a</sup> (N = 387)

Principal practice setting	Percent of GNPs work in setting
Long-term care facility	50
Office practice with physicians	17
Subacute facility	15
Assisted living center	15
Hospital ambulatory care (outpatient clinic)	11
In-hospital patient unit	10
VA medical center	8
Continuing care community	7
Office practice without physicians	4
Consultation services	4
Hospital emergency room	3
School of nursing	3
Adult day healthcare centers	3
Hospital geriatric services	3
Home health agency	2
Rural health clinic	2
Hospice	2
Private independent practice	2
Ambulatory care agency/HMO	1
Geriatric assessment center	1
Geriatric case management organization	1
Occupational health	1
Correctional facility	<1
Parish/church	<1
Local health department	<1

Note. HMO, health maintenance organization; VA, Veterans Administration.

<sup>a</sup>A GNP was counted with any particular setting if, as part of the principal practice, the GNP spent any amount of time at that type of setting.

### Provision of advanced clinical services and clinical procedures

The GNPs were asked to rate 17 advanced clinical services in terms of importance to their practice and frequency of use in their practice. Ratings were done on a 1–4 scale, with 4 indicating the greatest importance or frequency. Table 4 displays the average importance and frequency ratings for each of the 17 services. As can be seen in the table, the ratings of importance and frequency of use generally were similar. The services these GNPs deemed important were also the services they used often. The services rated highest in both importance and use were *order/interpret diagnostic tests* and *prescribe medications*, followed closely by *make comprehensive assessments*.

To assess whether GNPs were performing more nursing or more medical functions, we divided the services into three categories (based on judgments by a panel of experts): primarily nursing, primarily medical, and both nursing/ medical. We then created a mean importance and a mean frequency of use rating for each of the three categories. The GNPs rated services considered primarily medical equal in importance to services considered



primarily nursing; means for both were 3.4 on the 4-point rating scale. The GNPs rated services considered both medical and nursing slightly lower (mean = 3.0) in importance.

This same pattern was evident with services rendered. The mean rating for performance of medical services was 3.3, almost identical to the mean for nursing services, which were 3.2. The mean rating for services deemed both medical and nursing was slightly lower, at 2.7.

In addition, the GNPs were given a list of 31 clinical procedures and asked whether they *performed/provided*, *ordered/referred*, or neither. Almost 90% of the GNPs performed breast exams, and over 80% performed testicular/ prostate exams. Over half performed fingerstick blood sugar (56%) and foot care (53%). The great majority of the practitioners (74%–95%) had received their training for these clinical skills in either their basic RN program or NP program. Almost half of the GNPs perform pelvic/pap/ genital cultures (46%), urethral cultures (43%), and draw blood (43%). While the majority (70%–86%) of the GNPs learned these skills in their basic RN or NP education, 29% reported learning to draw blood *on the job*. Likewise, a fourth of the GNPs performed incision and drainage and over half of them learned this skill *on the job*. Although less than 10% of GNPs indicated that they performed biopsies, 46% had learned this procedure *on the job*. There is concern, of course, about those clinical procedures that GNPs perform, but have learned *on the job*, because the quality of this training is unknown. Twenty-one of the clinical procedures performed were deemed primarily medical and 10 were considered both medical and nursing. On average, the GNPs were performing 33% of medical/ nursing procedures compared to 16% of the primarily medical procedures.

### Effects of selected factors on GNP practice

When examining relationships of influence factors with GNP practice variables, it was deemed important to control for amount of patient contact. Therefore, the subsample of 234 active GNPs (practicing at least 35 h per week) was analyzed for direct patient care. There were two spheres of potential influence factors: educational preparation and work experience and work setting characteristics.

Educational preparation and work experience had three factors: basic RN education, years of experience as an RN before becoming a GNP, and years of experience as a GNP. For basic RN education, we compared those from an Associate degree or diploma program with those whose basic RN education was through a bachelor's degree or generic master's degree.

**Table 4** Importance and frequency of use for advanced clinical services (N = 387)

Clinical service	Mean importance rating	% Rated very important	Mean frequency of use	% Selected often
Order/interpret diagnostic tests <sup>a</sup>	3.8	86	3.9	91
Prescribe medications/write prescriptions <sup>a</sup>	3.8	85	3.8	89
Comprehensive assessment including but not limited to function, nutrition, culture, physical, psychosocial, environmental <sup>b</sup>	3.8	83	3.8	83
Discuss advanced directives <sup>b</sup>	3.5	69	3.4	65
Nonpharmacologic therapies <sup>b</sup>	3.5	57	3.6	66
Health promotion/disease prevention education, screening, and counseling <sup>b</sup>	3.5	62	3.5	65
Provide palliative care to the dying patient <sup>c</sup>	3.4	66	3.1	47
Clinical/case management <sup>c</sup>	3.3	53	3.3	56
Coordinator/member of interdisciplinary team <sup>b</sup>	3.3	3	3.2	51
Act as a change agent <sup>b</sup>	3.2	43	3.1	38
Prepare discharge summaries <sup>a</sup>	2.6	28	2.3	25
Develop patient education programs <sup>b</sup>	2.6	26	2.2	16
Program development and evaluation <sup>b</sup>	2.6	23	2.2	17
Manage/assist with patient databases <sup>b</sup>	2.5	23	2.4	20
Develop policies and procedures <sup>b</sup>	2.5	20	2.1	14
Conduct research <sup>b</sup>	2.4	21	1.8	8
Develop/facilitate support groups <sup>b</sup>	2.1	14	1.7	7

<sup>a</sup>Primarily medical.

<sup>b</sup>Both medical and nursing.

<sup>c</sup>Primarily nursing.

Six factors were included in the category of work setting characteristics. Two indicators of geographic region of practice were used. The type of area was classified as urban, suburban, or small city/rural. For the purpose of this survey, suburban was considered to be the suburbs of a moderate to large city. The categories of rural and small city were combined together, as were the three options of metropolitan area, large city, and moderate-sized city. The states in which GNPs were practicing were categorized into one of the four U.S. Census Bureau regions of the United States: Northeast, Midwest, South, and West. A third factor was number of principal practice settings: single versus multiple settings. Fourth, the principal practice settings were grouped into five broad types: hospital, long-term care, office, center/clinic, and other. Because of small numbers in the center/clinic and other settings, only the first three broad types were used for analyses. Whether or not the work setting received the majority of its funding from governmental sources was the fifth factor, and the final factor was whether or not the GNP was the first GNP at the principal practice setting.

The above factors were examined to determine if they had an effect on GNP practice, using three groups of outcome variables: practice characteristics, advanced clinical services, and clinical procedures. The two outcome practice characteristics we included in the analyses were whether or not the GNP had a DEA number and whether the GNP's relationship with the physicians at the principal practice was collaborative or independent. For advanced clinical services, the ratings of importance and use of services deemed primarily medical, primarily nursing, and both medical and nursing were used. Likewise, the clinical procedures that GNPs were performing or providing were investigated. These services were classified as either primarily medical or both medical and nursing.

To ensure that redundant or confounding factors were not being examined, the relationships among the potential influences within each category were explored. The problem of conducting multiple tests was balanced with the issue of missing potential confounds or redundancies by using a Bonferroni approach to correct individual alpha levels, setting experimentwise alpha at .10. Given the exploratory nature of this research, the same Bonferroni approach was used to evaluate relationships with the outcome measures.

### **Educational preparation and work experience**

Independent t-tests were conducted to compare GNPs whose basic nursing education was at the associate/diploma level with those whose basic nursing education was at the bachelor's level or above, on years of experience as an RN before becoming an NP, and on years of experience as an NP. There was no statistically significant difference in years of NP experience between the two groups. There was, however, a statistically significant difference in years of experience as an RN before becoming an NP,  $t(225) = 5.45, p < .0001$ : associate/diploma mean = 17.1 years; BSN/ master's mean = 11.2 years. This may be attributed to the fact that RNs at the associate/diploma level have to spend time earning their BSN before entering an NP program. These two variables may be confounded and further analyses with them will have to be viewed with caution.

Pearson correlation coefficient was calculated between the years of experience as an RN prior to NP and years of experience as an NP. The correlation of  $-.23$  suggested a slight negative relationship, certainly not at a level to cause concern about any confound.

The GNPs' basic RN education was not related to either outcome practice characteristic. A chi-square analysis using the two levels of basic RN education and whether or not the GNP had a DEA number was not statistically significant. Likewise, the chi-square analysis with basic RN education and the physician relationship was also not statistically significant.

Independent t-tests were performed in order to explore the relationships of the two experience variables with the two outcome practice characteristics. The t-test comparing years of NP experience for those with and without a DEA number was not statistically significant nor was the t-test comparing years of NP experience for those with collaborative versus independent relationship with physicians. Likewise, there was no statistically significant difference in years of experience as an RN prior to becoming an NP between GNPs with a collaborative or an independent relationship. However, there was a statistically significant difference in years of experience as an

RN prior to NP for those with and without a DEA number,  $t(224) = 2.24$ ,  $p = .0261$ . GNPs with a DEA number had been RNs longer prior to NP training (mean = 14.5 years) compared to GNPs without a DEA number (mean = 11.9 years).

**Table 5** Provision of and source of training in selected clinical procedures ( $N = 387$ )

Clinical procedure	Percent perform/provide	If perform/provide, source of original training			
		Basic RN education (%)	NP program (%)	Workshop (%)	On the job (%)
X-ray and imaging <sup>a</sup>	5	—	47	20	33
Ultrasound <sup>a</sup>	3	—	11	33	56
Laboratory <sup>a</sup>	10	32	35	—	32
Biopsies <sup>a</sup>	7	—	19	35	46
Lumbar puncture <sup>a</sup>	1	—	—	—	100
Casting <sup>a</sup>	4	—	38	15	46
Splinting <sup>b</sup>	15	20	26	17	37
Suturing <sup>a</sup>	18	3	34	55	8
I & D = s <sup>a</sup>	26	2	28	17	52
Intubation <sup>b</sup>	5	37	5	37	21
IV fluids <sup>b</sup>	29	71	11	2	16
EKGs <sup>a</sup>	33	35	26	11	29
Pelvic, pap, genital cultures <sup>a</sup>	46	1	85	1	13
Interpreting paps <sup>a</sup>	25	1	63	7	28
Breast exams/SBE education <sup>b</sup>	87	29	66	4	1
Testicular/prostate examination <sup>b</sup>	82	10	85	1	4
Urethral culture <sup>a</sup>	43	14	61	4	20
Minor surgery <sup>a</sup>	8	—	34	24	41
Foot care <sup>a</sup>	53	36	38	8	18
Chest tube placement <sup>b</sup>	1	33	—	—	67
Chest tube removal <sup>a</sup>	6	57	5	—	38
Trach removal/replacement <sup>a</sup>	15	59	4	2	35
Tracheotomy <sup>a</sup>	1	60	—	—	40
Draw blood gases <sup>b</sup>	9	45	6	9	39
Pulmonary function test <sup>b</sup>	8	19	35	8	38
Tonometry <sup>a</sup>	6	19	48	—	33
Wet mount <sup>a</sup>	26	4	67	3	26
Microscopic urinalysis <sup>a</sup>	21	32	41	1	26
Spun hematocrit <sup>b</sup>	11	38	35	2	25
Drawing blood <sup>b</sup>	43	63	7	—	29
Fingerstick blood sugar <sup>b</sup>	56	80	4	1	16

Note. I & D, incision and drainage; SBE, self breast examination.

<sup>a</sup>Primarily medical.

<sup>b</sup>Both medical and nursing.

Next, the study examined the relationships of nursing education and experience with the ratings of importance and use of advanced clinical services deemed primarily medical, primarily nursing, and both medical and nursing. Using t-tests, there were no statistically significant differences between the two levels of basic nursing education for any of the three importance ratings or three use ratings. Correlations associating years of RN experience and years of NP experience with the six importance and use ratings were very low ( $r$  ranged from .04 to .15), indicating no relationships with experience.

Finally, an analysis was done regarding the influence factors' effects on the percent of primarily medical or both medical and nursing clinical procedures performed or provided. Both t-tests using basic RN education were not statistically significant. All four correlations of experience with the percent of procedures performed or provided were extremely low ( $r$  ranged from .00 to .06), again indicating no relationships with experience.

In summary, two of the potential influence factors were related. GNPs originally educated in associate or diploma programs were RNs prior to NP education for a longer period than GNPs originally educated in bachelor's or master's programs. There was only one relationship between the influence factors and the outcome variables. GNPs with a DEA number were RNs prior to becoming NPs longer than GNPs without a DEA number.

### Selected work setting characteristics



All six factors within this sphere were categorical: type of area (urban, suburban, and small city/rural), geographical region of the United States (Northeast, Midwest, South, and West), number of primary practice settings (single versus multiple), type of setting (hospital, long-term care, and office), whether or not the GNP was the first GNP at the primary practice setting, and funding source (primarily governmental funding or not). A series of chi-square analyses were performed to examine relationships among the six potential influences. Of the 15 analyses, 8 yielded statistically significant results.

Type of area was significantly related to geographical region of the United States,  $\chi^2 (6, N = 228) = 20.10, p = .0027$ ; type of setting,  $\chi^2 (4, N = 195) = 15.91, p = .0031$ ; and first GNP,  $\chi^2 (2, N = 223) = 13.77, p = .0010$ . GNPs practicing in the South were more likely to be practicing in small cities or rural areas (28%), while GNPs in the Western region were likely to practice in an urban area (75%) and unlikely to practice in a suburban area (7%). GNPs in the Northeast were the most likely to be practicing in a suburban area (38%). GNPs in suburban and small city/rural areas were more likely to be the first GNP at their practice (64% and 74%, respectively). GNPs in suburban areas were most likely to be in a long-term care facility (73%) and least likely to be in an office (7%). Urban area GNPs were more likely to be practicing in a hospital (32%), while GNPs from small city/rural areas were more likely to practice in an office (35%).

Type of setting was also significantly related to number of settings,  $\chi^2 (2, N = 199) = 9.97, p = .0068$ ; to funding source,  $\chi^2 (2, N = 196) = 24.60, p < .0001$ ; and to first GNP,  $\chi^2 (2, N = 195) = 17.25, p = .0002$ . GNPs in hospital settings were more likely to work in a single setting (74%) while most of the GNPs in office settings practiced in multiple settings; GNPs at long-term care facilities were equally likely to be in single or multiple settings. Hospitals and long-term care facilities were more likely to receive most of their funding from governmental sources (75% and 63%, respectively) while office practices had other primary sources of funding (77%). GNPs working in office settings were more likely to be the first GNP at their practice (85%) while GNPs in hospital settings were less likely to be the first GNP (43%). For long-term care, equal numbers of GNPs were the first GNP or not.

Finally, funding source was also significantly related to number of settings,  $\chi^2 (1, N = 221) = 10.72, p = .0011$ , and to first GNP,  $\chi^2 (1, N = 226) = 8.93, p = .0028$ . GNPs that practiced in a setting receiving the majority of funding from governmental sources were more likely to work at a single setting (64%) than GNPs at settings with nongovernmental funding (41%). Those in nongovernmental-funded settings were more likely to be the first GNP at their practice (69%).

In summary, GNPs in urban areas tended to be from the Western region of the United States and to practice in hospitals. Suburban-located GNPs were from the Northeast and more likely to be at a long-term care facility and to be the first GNP at their practice. GNPs in small city/rural areas were often from the South, in office practice, and the first GNP in the practice. GNPs based in hospitals generally worked in only one setting, while GNPs in office practice tended to work in multiple settings and were the first GNP in their practice. Given the number of significant relationships among these potential influences, we must assume that there are major confounds between the factors. Therefore, further analyses must be interpreted with caution.

The potential influence of the six work setting characteristics was tested on having a DEA number and on the relationship with practice physicians using chi-square analyses. Only two statistically significant relationships were found. Geographic region was associated with having a DEA number,  $\chi^2 (N = 233) = 20.92, p < .0001$ . GNPs in the Northeast were most likely to have a DEA number (82%) followed by GNPs in the West (71%) and Midwest (61%). GNPs practicing in the South were least likely to have a DEA number (44%). Type of setting was also related to having a DEA number,  $\chi^2 (N = 198) = 14.16, p = .0008$ . GNPs working in long-term care settings were most likely to have a DEA number (75%) while those working in hospitals were least likely (45%). None of the work setting characteristics were related to the GNPs' relationships with practice physicians.

The study evaluated the individual effects of the six work setting characteristics on the importance and frequency of use ratings of advanced clinical services (primarily medical, primarily nursing, or both) and on the provision of advanced clinical procedures (primarily medical or both). Analyses of variances were used for type of area, geographic region, and type of setting, while number of settings, funding source, and whether or not the first GNP were assessed with *t*-tests. Given the confounds among the six influence factors, we did not feel it appropriate to construct and test any prediction models.

Funding source and geographic region were not significantly related to any of the eight ratings. However, the type of area in which the GNP practiced was significantly related to both types of clinical procedures performed: those deemed primarily medical,  $F(2,225) = 13.91, p < .0001$  and those deemed both medical and nursing,  $F(2,225) = 13.52, p < .0001$ . GNPs practicing in small city/rural areas performed higher percentages of both types of clinical procedures (medical mean = 26.33 and both mean = 45.49) than their suburban (medical mean = 13.33 and both mean = 34.44) or urban counterparts (medical mean = 13.56 and both mean = 27.88).

There was a statistically significant relationship between being the first GNP in the practice and the percent of primarily medical advanced clinical services performed,  $t(227) = 3.08, p = .0023$ . GNPs who were the first in their practice performed a higher percentage of these services than GNPs who were not the first in their practice (mean of 19.24 compared to 12.74).

The number of settings that GNPs practiced in was significantly related to the importance of primarily medical advanced clinical services,  $t(219) = -2.83, p = .0052$ ; frequency of primarily medical advanced services,  $t(217) = -4.02, p < .0001$ ; frequency of primarily nursing advanced clinical services  $t(217) = -2.77, p = .0061$ ; and the percent of primarily medical advanced procedures performed,  $t(222) = -3.78, p = .0002$ . In all cases, GNPs in multiple practice settings had higher scores. They rated medical advanced services higher (mean = 3.56 compared to 3.37 for GNPs in single settings); they practiced medical advanced services more often (mean = 3.55 compared to 3.29); they practiced nursing advanced services more often (mean = 3.39 compared to 3.12); and they performed a higher percentage of advanced medical procedures (mean = 19.94 compared to 12.08).

The type of practice setting was significantly related to the importance of advanced clinical services that are both medical and nursing,  $F(2,193) = 7.57, p = .0007$ ; the use of medical advanced services,  $F(2,191) = 12.65, p < .0001$ ; the use of medical/nursing advanced services,  $F(2,191) = 8.79, p = .0002$ ; and the percent of medical advanced clinical procedures practiced,  $F(2,196) = 6.88, p = .0013$ . GNPs practicing in hospitals gave significantly higher ratings to the importance of medical services (mean = 3.19) than those working in long-term care (mean = 2.82). GNPs in long-term care facilities used more medical clinical services (mean = 3.56) than GNPs in office settings (mean = 3.28) and GNPs in hospitals (mean = 3.18). Hospital-based GNPs performed more advanced procedures deemed both medical and nursing (mean = 2.98) than GNPs in long-term care (mean = 2.61). Finally, GNPs in office settings performed a higher percentage of medical clinical services (mean = 24.21) than either GNPs in hospitals (mean = 14.67) or GNPs in long-term care (mean = 13.06).

In summary, the number and type of setting had the most influence on advanced clinical services and procedures. GNPs in multiple practice sites rated the importance of medical services higher, used medical services and nursing services more often, and performed a higher percentage of medical procedures. GNPs in hospital settings rated the importance of medical services higher and performed a higher percentage of medical/nursing procedures. GNPs in long-term care facilities used more medical services. Finally, GNPs working in an office performed a higher percentage of medical procedures.

## Discussion

This was the first nationwide study focusing comprehensively on GNPs in more than 15 years. Despite the growing demands for GNPs, of the 472 GNPs who responded to the survey, only half were working full time as a GNP. Kleinman (1990) found similar results; nurse practitioners trained as GNPs are often employed in other positions because of inability initially to find a job as a GNP. The demographic profile of GNPs is similar to

nurse practitioners in all specialties: master's prepared middle-aged Caucasian females (Goolsby, 2005; Pulcini & Vampola, 2000).

GNPs practice primarily in long-term care, but they are continuing to move into other practice settings such as subacute facilities, assisted living centers, and continuing care communities. This was not as common 15 years ago. Despite the fact that the GNP role has existed for more than 30 years (Ebersole, 1985), over half of the sample indicated that they were the first GNP in their practice. As GNPs have expanded their roles, many have acquired both hospital and nursing home privileges. The GNPs in this study were performing procedures considered medical acts as well as nursing procedures. This was most apparent among GNPs who were the first nurse practitioner in their setting; they had a tendency to practice more advanced clinical services than those who were not the first. In the past, physicians often delegated to nurse practitioners tasks that were more traditionally nursing rather than have them engaged in medical acts (Garland & Marchione, 1982). Clearly, this has changed. Not surprisingly, GNPs who practiced in multiple settings had many job responsibilities deemed medical acts as well as clinical nursing procedures.

### **Study limitations**

Not all ANCC-certified GNPs give permission to ANCC to release their names for research purposes. Moreover, we had very different return rates for the survey from NC GNP members versus nonmembers. We do not know why the nonmember return rate was much lower than the member rate and what effect that may have on the findings of the survey. Therefore, findings of this study must be viewed with caution. Furthermore, some of the results of this study were limited to GNPs who were practicing full time in the role. Additional examination of the practice of the GNPs not engaged full time is warranted.

### **Implications for nursing education**

GNPs continue to work in multiple practice settings often in positions requiring them to manage the care of older adults in more than one type of clinical agency. Nurse practitioner educators need to adequately prepare GNPs for this continuum of care. Not only is it important for GNP students to be competent to order diagnostic tests and prescribe medications but also to accurately discuss advanced directives. The majority of respondents indicated that this is an important role responsibility. Lambing, Adams, Fox, and Divine (2004) found this to be true especially of nurse practitioners working with inpatient geriatric populations. Clinical practicum experiences for GNP students need to include opportunities to participate on interdisciplinary teams and in case management; 50% of these respondents indicated that they not only valued these role responsibilities but engaged in them on a regular basis.

Few studies have been conducted examining clinical skills or procedures that nurse practitioners are taught as part of their educational preparation. Cole and Ramirez (2003) reported that less than 20% of 78 identified clinical procedures were taught by more than 50% of FNP programs surveyed. The faculty who responded to the survey indicated that 37 skills would be important to teach to FNP students because many practicing FNP are learning clinical skills either on the job or in continuing education programs. Similarly, Colyar and Ehrhardt (2005) found that over half of the 10 most common skills performed by nurse practitioners were learned during on-the-job-training, and Kleinpell, Hravnak, Werner, and Guzman (2006) determined that acute care nurse practitioners learn specialty skills after employment. The GNPs in this study also had to seek specialized training after graduation to meet job requirements. Hart (2007) found that graduates of nurse practitioner programs desire more training in clinical skills such as suturing, splinting, and electrocardiogram (EKG) and x-ray interpretation. Despite the availability of nurse practitioner curricular guidelines and specialty competencies, additional work is needed to determine the actual clinical experiences that are associated with nurse practitioner educational programs (Goolsby, 2000).

### **Conclusions**

This study provides insight into the complex practice characteristics of GNPs. GNPs are combining the nursing skills so necessary to care for older adults with advanced clinical services and clinical procedures practiced by physicians. Various factors influence how GNPs practice, including geographic location, type of practice, and

whether the GNP was the first person to be employed as a nurse practitioner at the practice site. Consistent with findings from an earlier study (Kleinman, 1990), not all certified GNPs are engaged in direct patient care full time. Given the existing shortage of gerontological health care providers, efforts should be made to reach out to these GNPs for retooling, ensuring continued clinical competency of these practitioners so they may care for the healthcare needs of the rapidly growing aging population (Futrell & Mellio, 2005).

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