

*Pennsylvania*

WORKFORCE INVESTMENT BOARD

# Increasing Pennsylvania's Clinical Education Capacity

Recommendation Report  
from the  
Clinical Education Task Force

October 2006

Pennsylvania Center for Health Careers

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# Executive Summary

The mission of the Task Force was to develop recommendations that will expand the capacity of the clinical education system to allow for an increase in the number of students served within Pennsylvania's nursing programs.

The long-term goal is to increase the number of graduates from nursing programs who successfully obtain licensure, upgrade their skills, and practice nursing in Pennsylvania.

The Task Force identified faculty capacity, clinical sites, and health care technology as the three priorities to increase Pennsylvania's clinical education capacity.

## FACULTY CAPACITY

### Recommendation 1

#### **Develop methodology to accurately forecast statewide and regional supply and demand for nurse faculty in the Commonwealth on an ongoing basis**

Suggested Strategies:

- Modify and streamline data collection methods by revising the Pennsylvania State Board of Nursing Professional and Practical Nursing Education Program Annual Report surveys to better capture information related to nurse faculty in Board approved nursing education programs
- Examine and analyze nursing faculty data available through existing sources including the Licensure Renewal Survey

### Recommendation 2

#### **Support the creation and sustainability of opportunities that will expand the supply of qualified nurse faculty**

Suggested Strategies:

- Support the need to improve compensation that promotes recruitment and retention of qualified faculty at all educational levels
- Provide incentives that encourage health care employers to provide academically and experientially qualified nurses to assist nursing education programs in the education of students
- Create opportunities that assist nursing education programs to hire and retain qualified faculty and staff to (1) assist in the coordination and mentoring of part-time, contracted and/or adjunct faculty; and (2) provide for a coordinator to manage and integrate simulation technology into the curriculum
- Develop a statewide on-line module that provides basic teaching resources for use by clinical experts transitioning or fulfilling a dual-career faculty role

### Recommendation 3

#### **Develop practices to motivate nursing students and experienced nurses to become nursing faculty**

Suggested Strategies:

- Establish mentoring programs that encourage experienced nurses and nursing students to pursue advanced degrees, academic careers, and faculty positions
- Create opportunities that expose nursing students and experienced nurses to the nurse faculty role
- Support initiatives to attract historically underrepresented populations to pursue faculty positions
- Encourage succession planning to ensure strong nursing leadership in academic settings

### Recommendation 4

#### **Create and support clinical preceptor development programs for nursing students**

Suggested Strategies:

- Create incentives for health care entities to work collaboratively with nursing education programs in the development of nursing student preceptor programs
- Create incentives and rewards for individuals who want to serve as student nurse preceptors
- Develop a statewide on-line module that provides basic teaching resources for use by clinical preceptors

## CLINICAL SITES

### Recommendation 5

#### **Develop a Commonwealth-wide clinical site database to maximize the availability and use of clinical sites**

Suggested Strategies:

- Work with the Pennsylvania State Board of Nursing to determine the desirability and feasibility of developing a Commonwealth-wide clinical site database for nursing and allied health professions (e.g. the Oregon *StudentMAX* model)
- Conduct a regional pilot project to inventory available clinical sites
- Revise the Pennsylvania State Board of Nursing Agency Data Form to make the information it collects more accessible
- Promote the use of clinical sites outside of the traditional hospital setting that support nursing education objectives

## HEALTH CARE TECHNOLOGY

### Recommendation 6

#### **Support the use of current and future clinical education technologies and simulated learning in nursing education**

Suggested Strategies:

- Provide financial support to create and maintain a central repository to share best practices; available funding opportunities; and promote education-focused forums
- Support the facilitation of regional partnership efforts that promote the use and sharing of health care technologies across educational institutions and/or practice settings
- Support the integration of technology into the nursing curriculum, particularly where it can supplement the clinical experiences in economically distressed and rural areas
- Create opportunities that assist nursing education programs to provide for a coordinator to manage and integrate simulation technology into the curriculum
- Support initiatives that foster faculty development in the use and/or application of different technologies in nursing and interdisciplinary professional education

# Introduction

Governor Edward G. Rendell created the Pennsylvania Center for Health Careers (PCHC) in April 2004. The Center is a public/private initiative led by a Leadership Council of employers, Commonwealth agencies, industry associations, labor unions, professional associations, and educational institutions. It is an initiative of the Pennsylvania Workforce Investment Board (PA WIB) and serves as a catalyst to develop action-oriented strategies to respond to Pennsylvania's short- and long-term health care workforce challenges.

The Governor and PCHC recognize the importance of the nursing profession across the Commonwealth, especially given the growing shortage of nurses who care for patients and educate the future workforce. Thus, the PCHC works in concert with other key governmental organizations focused on alleviating the nursing shortage, including the Pennsylvania Department of Health and the Pennsylvania State Board of Nursing.

The PCHC has developed two reports on the supply of and demand for Registered Nurses (RNs) and Licensed Practical Nurses (LPNs) – *The Registered Nurse Workforce in Pennsylvania* and *The Licensed Practical Nurse Workforce in Pennsylvania*. The RN report indicates that the shortage of RNs in Pennsylvania likely will be as large as 16,100 by 2010. The LPN report shows that the shortage of LPNs likely will be as large as 4,100 by 2010. The reports also indicate that the current total number of graduates from nursing programs is below the number of graduates in 1995, despite an increase in the number of students enrolling in Pennsylvania's RN and LPN programs.

In addition, the PCHC published *Addressing Pennsylvania's Nursing Education System Capacity: Recommendation Report of the Pennsylvania Center for Health Careers*, in October 2004 as an outcome of its Nursing Education System Capacity initiative. The report outlines 15 recommendations regarding nurse educator recruitment and advancement, clinical education, and attraction and retention of nursing students. The Pennsylvania Higher Education Assistance Agency (PHEAA) and the Pennsylvania Higher Education Foundation (PHEF) have implemented six initiatives to increase the number of qualified nurse educators as a result of the 15 recommendations.

The PCHC's next step was to develop a strategy to best address the Commonwealth's key issues associated with clinical education. The PCHC created an Ad Hoc Task Force on Clinical Education<sup>1</sup> comprised of industry and education leaders from across the Commonwealth. The Task Force identified and prioritized three major issues that influence clinical education capacity in this report:

- Faculty Capacity
- Clinical Sites
- Health Care Technology

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<sup>1</sup> Refer to Appendix I for a list of Task Force Members

The Faculty Capacity section of this report explains the impact that a shortage of clinical faculty can have on the availability of clinical experiences and the quality of clinical education. A multitude of entities, including the Pennsylvania Department of Health, collect information regarding the nursing profession in the Commonwealth. The culmination of this data suggests there is a need for more nurse educators in the Commonwealth. However, there is a need to modify and streamline data collection and analysis methods.

Policy makers and practitioners also are concerned about the availability of clinical sites, the quality of experiences students receive at sites, and how these circumstances affect the supply of nurses. The Pennsylvania State Board of Nursing (Board) collects clinical education data through its Agency Data Form; however, this information is not available in an aggregate form. Therefore, it is difficult to know whether the Commonwealth has an abundance or dearth of clinical sites.

Health educators increasingly rely on varying forms of technology to aid in instructing new generations of health care professionals. Advancements in the sophistication of technology make it an important tool for clinical education. Technology allows nursing students to practice standardized skills in a controlled environment. This minimizes risk and maximizes the positive outcomes of clinical education such as increased confidence, competency, and collaboration.

The following section provides research to support the Task Force's recommendations regarding faculty capacity, clinical sites, and health care technology.

# Supporting Research

## FACULTY CAPACITY

The faculty capacity section of this report builds the case that a faculty shortage persists in Pennsylvania despite the efforts of numerous colleges, universities, PHEAA, and PHEF to increase the number of nurses. It also discusses the implications of this shortage and suggests ways to increase the supply of nursing faculty.

The research team assembled data from existing sources to provide as holistic an approach to examining the supply of and demand for clinical faculty as possible. The team utilized data from Commonwealth agencies such as the Department of Health, Center for Workforce Information and Analysis (CWIA), State Board of Nursing (Board), and PCHC. National accreditation agencies such as the American Association of Colleges of Nursing (AACN) and National League for Nursing (NLN) also contributed data. One unintended finding of this report is the decentralization of data regarding nursing faculty. Therefore, despite significant efforts of the entities listed above, a need exists to modify and streamline data collection and analysis methods relating to the nursing profession.

To this end, the Pennsylvania Center for Health Careers submitted a series of recommended additions to the Professional and Practical Nursing Education Program Annual Reports to the Board on June 23, 2006. The recommendations include formatting changes to accurately inventory part-time and/or contracted faculty who typically serve in clinical faculty positions. Doing so will allow for a more accurate assessment of the supply of and demand for clinical faculty throughout nursing programs in Pennsylvania.

### Recommendation 1

#### **Develop methodology to accurately forecast statewide and regional supply and demand for nurse faculty in the Commonwealth on an ongoing basis**

##### Suggested Strategies:

- Modify and streamline data collection methods by revising the Pennsylvania State Board of Nursing Professional and Practical Nursing Education Program Annual Report surveys to better capture information related to nurse faculty in Board approved nursing education programs
- Examine and analyze nursing faculty data available through existing sources including the Licensure Renewal Survey

## Faculty Shortages

Based on the examination of existing data sources listed previously, there are at least three ways to measure the Commonwealth's nursing faculty shortage. First, faculty vacancy rates can be used to determine additional faculty needs. Second, the number of qualified applications to nursing programs and the number of vacant seats in programs can indicate if educational institutions are working together to accommodate all qualified applicants. Third, student-to-faculty ratios can indicate whether or not nursing programs have enough faculty to ensure safe, high-quality educational experiences. Each measurement and its implications are discussed below.

## Faculty Vacancy Rates

The American Association of Colleges of Nursing's (AACN) *Special Survey of AACN Membership on Vacant Faculty Positions for Academic Year 2005 -2006, July 2005* indicates 817 faculty vacancies in 409 nursing schools across the United States. The AACN's data showed a national faculty vacancy rate of 8.5 percent, which equates to approximately two vacancies per school. The National League for Nursing's *Nurse Educators 2006: A Report of the Faculty Census Survey of RN and Graduate Programs* further reports that faculty vacancy rates are highest in baccalaureate and advanced degree programs. The estimated national number of full-time faculty vacancies in 2006 is 1,390 with 869 vacancies in baccalaureate and advanced degree programs. The NLN reports 2006 national vacancy rates at: 7.9 percent for baccalaureate and higher degree programs, 5.6 percent for associate degree programs, and 3.5 percent for diploma programs.

Similar data regarding faculty vacancy rates are not available for Pennsylvania. However, the Pennsylvania Department of Health's *State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on data from Nursing Education Program Annual Reports, 2004* projects that 469 additional faculty are needed to service 4,000 more nursing students while keeping 2004 student-to-faculty weighted ratios constant. The following table shows the breakdown of additional faculty needed to educate 1,000 additional students in each program type.

Table 1: Additional Faculty Required to Serve 1,000 Additional Students per Program Type Based on 2004 Student-Faculty Ratios

| Program Type          | Number of Additional Students | Number of New Faculty Required |
|-----------------------|-------------------------------|--------------------------------|
| RN-Baccalaureate      | 1,000                         | 94                             |
| RN-Diploma            | 1,000                         | 109                            |
| RN-Associate's Degree | 1,000                         | 112                            |
| LPN                   | 1,000                         | 154                            |
| <b>Total</b>          | <b>4,000</b>                  | <b>469</b>                     |

\* Pennsylvania Department of Health (State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on Data from Nursing Education Program Annual Reports, 2004)

## Ability to Accommodate Qualified Applications

The AACN collects data regarding the number of qualified applications accepted and the number of vacant seats in its member schools. These schools educate nurses at the baccalaureate level and higher. AACN data showed more than 700 qualified applications to Pennsylvania nursing schools were turned away in 2004 (Table 2). Pennsylvania's entry-level baccalaureate degree programs did not accept 558 qualified applications. Another 62 applications from registered nurses interested in completing their baccalaureate degree were turned away. Nursing schools also were not able to accept 70 master's degree and 21 doctoral degree qualified applications. It is important to note that these figures may include individuals who applied to multiple schools. Similar application data currently are not available for LPN, diploma, and associate's degree programs.

Table 2: Qualified Applications Not Accepted & Vacant Seats in Pennsylvania Nursing Programs & State System of Higher Education Universities in 2004

| Program Type    | Total Qualified Applications Not Accepted | Total Vacant Seats | SSHE Qualified Applications Not Accepted | SSHE Vacant Seats |
|-----------------|---|--------------------|--|-------------------|
| Entry-Level BSN | 558                                       | 295                | 127                                      | 11                |
| RN-to-BSN       | 62  | 187                | 21                                       | 39                |
| Master's        | 70  | 366                | 0  | 16                |
| Doctoral        | 21  | 1                  | N/A                                      | N/A               |
| <b>Total</b>    | <b>711</b>                                | <b>849</b>         | <b>148</b>                               | <b>66</b>         |

\* AACN, 2004a (Qualified Applications Accepted and Enrolled and Number of Vacant Seats by Type of Nursing Program In Pennsylvania Schools)

According to the AACN, the number of vacant seats in Commonwealth nursing programs shows that there is a potential to accommodate many of the qualified applications not accepted. Nearly 850 nursing program seats were available in 2004, while 711 qualified applications were not accepted (Table 2). A majority of these vacancies was in baccalaureate and master's degree programs.

The following information focuses on Pennsylvania State System of Higher Education (SSHE) universities, because Commonwealth policies are most likely to affect these institutions. SSHE universities offer associate's, entry-level baccalaureate, LPN-to-baccalaureate, RN-to-baccalaureate, and/or master's degree programs. SSHE universities currently do not offer doctoral programs in nursing. According to AACN data, five SSHE universities offer entry-level baccalaureate programs, eleven offer RN-to-baccalaureate programs, and six offer master's degree programs. Shippensburg University and Cheyney University do not have nursing programs. Lock Haven University has an associate's degree program. Table 3 shows the nursing programs each SSHE university offers.

Table 3: Pennsylvania SSHE University Nursing Programs Offered in 2004

| PA SSHE University       | Associate's | Entry-Level BSN | LPN-to-BSN | RN-to-BSN | Master's |
|--------------------------|-------------|-----------------|------------|-----------|----------|
| Bloomsburg University    |             | X               |            | X         | X        |
| California University    |             |                 |            | X         |          |
| Clarion University       |             |                 |            | X         | X        |
| East Stroudsburg         |             |                 | X          | X         |          |
| Edinboro University      |             | X               | X          | X         |          |
| Indiana University       |             | X               |            | X         | X        |
| Kutztown University      |             |                 |            | X         |          |
| Lock Haven University    | X           |                 |            |           |          |
| Mansfield University     |             | X               |            | X         | X        |
| Millersville University  |             |                 |            | X         | X        |
| Slippery Rock University |             |                 |            | X         |          |
| West Chester University  |             | X               |            | X         | X        |

\* AACN, 2004a (Qualified Applications Accepted and Enrolled and Number of Vacant Seats by Type of Nursing Program In Pennsylvania Schools) and SSHE nursing program websites (Associate's and LPN-to-Baccalaureate programs)

West Chester University and Bloomsburg University turned away qualified applications to their entry-level BSN programs, while Millersville University had 10 vacant sets in its entry-level program in 2004. West Chester University had one vacant seat in its entry-level baccalaureate program and turned away 100 qualified applications to this program. Bloomsburg University had no vacant seats in its entry-level baccalaureate program and turned away 27 qualified applications. California University of Pennsylvania had 39 vacant seats in its RN-to-BSN program. Millersville University had 15 vacant seats in its master's degree program, and Mansfield University had one vacant seat in its master's degree program (Table 4).

Table 4: Vacant Seats and Qualified Applications Not Accepted in Pennsylvania State System of Higher Education (SSHE) Nursing Programs in 2004

| PA SSHE University | Entry-Level BSN |              | RN-to-BSN    |              | Master's     |              |
|--------------------|-----------------|--------------|--------------|--------------|--------------|--------------|
|                    | Vacant Seats    | Not Accepted | Vacant Seats | Not Accepted | Vacant Seats | Not Accepted |
| Bloomsburg         | 0               | 27           | NL           | 0            | NL           | 0            |
| California         | -               | -            | 39           | 0            | -            | -            |
| Clarion            | -               | -            | NL           | 0            | NL           | 0            |
| E. Stroudsburg     | -               | -            |              |              | -            | -            |
| Edinboro           |                 |              |              |              | -            | -            |
| Indiana            | 0               | 0            | NL           | 0            | NL           | 0            |
| Kutztown           | -               | -            | 0            | 21           | -            | -            |
| Mansfield          | 10              | 0            |              |              | 1            | 0            |
| Millersville       | -               | -            | NL           | 0            | 15           | 0            |
| Slippery Rock      | -               | -            |              |              | -            | -            |
| West Chester       | 1               | 100          | NL           | 0            | NL           | 0            |
| <b>Totals</b>      | <b>11</b>       | <b>127</b>   | <b>39</b>    | <b>21</b>    | <b>16</b>    | <b>0</b>     |

\* AACN, 2004a (Qualified Applications Accepted and Enrolled and Number of Vacant Seats by Type of Nursing Program in Pennsylvania Schools)

Shaded boxes indicate nursing programs that did not report data

- = program did not exist or was phasing out

NL = schools does not limit the number of students accepted

## Student-to-Faculty Ratios

The Pennsylvania Department of Health's *State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on Data from Nursing Education Program Annual Reports, 2004* indicates student-to-faculty ratios increased in RN-diploma and RN-baccalaureate programs between 1999 and 2004. Over this five-year period, faculty in RN programs grew by 54 percent, while student enrollments increased by 83 percent.

On the other hand, LPN student enrollments increased by 70 percent from 1999 to 2004, while LPN faculty members increased by 138 percent. In 2004, student-to-faculty ratios in LPN programs decreased from 9:1 to 7:1, while ratios climbed from 9:1 to 11:1 in RN programs (Table 5).

Table 5: Pennsylvania Mean (Weighted) Student-to-Faculty Ratios from 1999 to 2004

| Program Type     | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|------------------|------|------|------|------|------|------|
| LPN              | 9:1  | 8:1  | 9:1  | 10:1 | 9:1  | 7:1  |
| RN-Diploma       | 7:1  | 7:1  | 9:1  | 10:1 | 10:1 | 9:1  |
| RN-Associate's   | 9:1  | 9:1  | 9:1  | 9:1  | 10:1 | 9:1  |
| RN-Baccalaureate | 7:1  | 7:1  | 7:1  | 9:1  | 10:1 | 11:1 |

\* Pennsylvania Department of Health, 2006 (State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on data from Nursing Education Program Annual Reports, 2004)

The data presented in this section should be considered carefully, because some nursing programs included part-time, adjunct, and contractual faculty in their student-to-faculty ratios. More precise data is needed to understand the actual number of full-time equivalents dedicated to teaching nursing students.

The Pennsylvania State Board of Nursing regulates clinical student-to-faculty ratios in LPN programs, but it does not set a maximum ratio for RN programs. The maximum LPN program clinical student-to-faculty ratio is 15:1 (49 Pa.Code 21.191 (2)). The AACN reports that several states mandate maximum ratios of 8:1 to 10:1 in *Expand the Reach of the Nursing Education Act with New Initiatives: AACN Recommendations to Address the Nursing Shortage* (2001).

Furthermore, 58 percent of 84 deans and department chairs who responded to a 2005 Georgia Nurses Association survey believe that patient safety is compromised when clinical student-to-faculty ratios reach 10:1 (Commission on Nursing Practice, 2005). Respondents indicated that the most ideal clinical student-to-faculty ratio is 6:1.

## Supply of Nurse Faculty

### Recommendation 2

#### **Support the creation and sustainability of opportunities that will expand the supply of qualified nurse faculty**

##### Suggested Strategies:

- Support the need to improve compensation that promotes recruitment and retention of qualified faculty at all educational levels
- Provide incentives that encourage health care employers to provide academically and experientially qualified nurses to assist nursing education programs in the education of students
- Create opportunities that assist nursing education programs to hire and retain qualified faculty and staff to (1) assist in the coordination and mentoring of part-time, contracted and/or adjunct faculty; and (2) provide for a coordinator to manage and integrate simulation technology into the curriculum
- Develop a statewide on-line module that provides basic teaching resources for use by clinical experts transitioning or fulfilling a dual-career faculty role

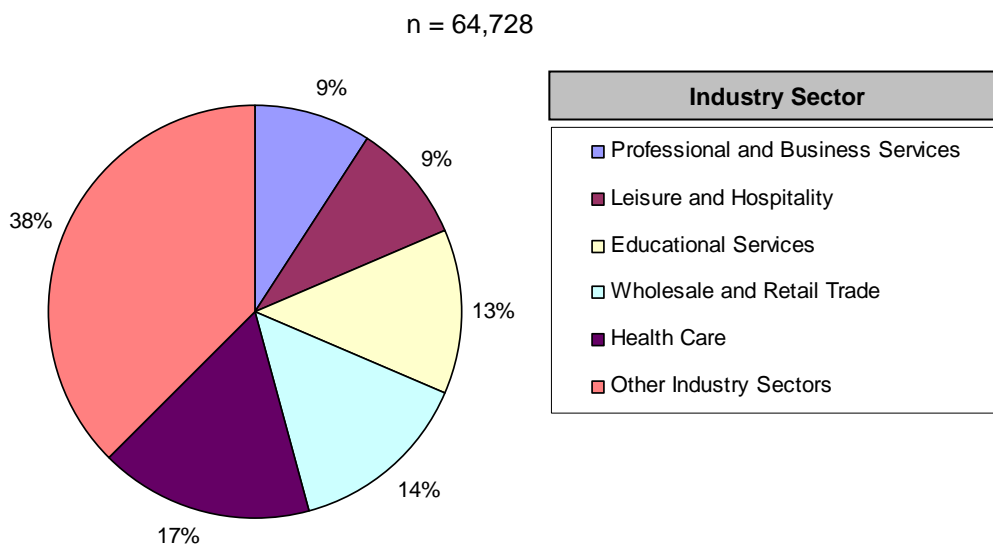
The clinical faculty shortage is linked to the overall nursing shortage, because it limits the number of nursing students educational institutions can accommodate. Numerous awareness campaigns have increased the number of student enrollments in nursing programs. However, several factors can impede nursing faculty growth. These include competition from other work environments and the growing number of faculty retirements. Competitor work environments include those outside of direct patient care, within clinical practice, and within academia. Individuals working in these settings have one major commonality – they receive better compensation than nurse faculty members.

#### Competition Outside of Direct Patient Care

Fewer nurses and nurse educators are available because of career options outside of direct patient care. Decades ago, nursing was among a few “female” career choices. Women in the United States now are pursuing a variety of careers (Hinshaw, 2001). A U.S. Bureau of Labor Statistics survey of 64,728 employed women indicated that the largest female employment sector in 2003-2004 remained health care at approximately 17 percent. Nevertheless, Figure 1 shows that 83 percent of respondents are employed in industries other than health care.

Businesses such as insurance companies, managed care plans, pharmaceutical firms, health care technology companies, medical device vendors, and consulting firms have become major competitors for well-educated nurses as well (Joint Commission on Accreditation of Healthcare Organizations, 2002). Businesses hire nurses because their credentials and experience in nursing make them reputable in the minds of employers, customers, and clients (Hinshaw, 2001). Nurses are attracted to these positions because they offer regular work hours and higher compensation (Joint Commission on Accreditation of Healthcare Organizations, 2002).

Figure 1: Female Employment by Industry Sector for 2003-2004



\* U.S. Bureau of Labor Statistics, 2004

#### Competition from Clinical Employment

Nurses with strong knowledge in their specialty area are in high demand, and many skills required for teaching are skills desirable in clinical managers and administrators. Moreover, novice clinical educators may not enjoy the transition from the practice setting to the educational setting because of their new responsibilities including supervising students, completing paperwork, and adopting new technology. This situation may prompt novice nurse educators to return to full-time, patient-focused clinical practice (Gormley, 2003).

Clinical nurse faculty members also are drawn back to full-time clinical employment because the compensation is higher. The Pennsylvania Center for Workforce Information and Analysis (CWIA) collected data in May 2005 on several nursing occupations. Medical and health services managers typically earned the highest income. Their salaries ranged from \$45,000 to \$88,030 in 2005, with an average annual wage of \$73,680. Pennsylvania nursing faculty members with a master's degree typically earned \$34,700 to \$69,610 per year, with an average annual wage of \$57,970. Registered nurses typically earned slightly less than nurse faculty. Their salaries ranged from \$39,710 to \$61,200, with an average annual wage of \$50,040. The following table highlights the disparity in compensation between nursing faculty careers and those in other clinical or administrative positions.

Table 6: Comparison of Pennsylvania Full-Time Faculty, Clinical, and Administrative Salaries

| Occupation                         | Educational Attainment             | Entry Annual Wage | Average Annual Wage | Median Annual Wage | Experienced Annual Wage |
|------------------------------------|------------------------------------|-------------------|---------------------|--------------------|-------------------------|
| Medical & Health Services Managers | Work experience plus degree        | \$45,000          | \$73,680            | \$65,840           | \$88,030                |
| Nursing Faculty                    | Master's degree                    | \$34,700          | \$57,970            | \$56,280           | \$69,610                |
| Registered Nurses                  | Associate degree**                 | \$39,710          | \$54,040            | \$53,110           | \$61,200                |
| Licensed Practical Nurses          | Postsecondary vocational education | \$28,470          | \$37,990            | \$36,250           | \$42,750                |

\* Pennsylvania Center for Workforce Information and Analysis (CWIA), May 2005

\*\* According to the CWIA analysis, an associate's degree is the most common level of educational attainment for registered nurses. Many employers require a baccalaureate degree while others may require a diploma.

### Competition from within Academia

Career advancement opportunities within academia contribute to the shortage of clinical nurse educators as well. Highly motivated and talented educators may become deans or heads of departments of nursing. While these roles are important to the sustainability of nursing programs, deans and department chairs spend little time interacting with students. Furthermore, the AACN reports in *Faculty Shortages in Baccalaureate and Graduate Nursing Programs: Scope of the Program and Strategies for Expanding Supply* (2003) that an increasing number of nurses with doctoral degrees are selecting full-time research positions. Researchers are essential to the profession because they introduce new evidence-based nursing practices. Researchers usually do not want to teach, particularly at the undergraduate level, because their compensation is often dependent on the amount of income they can generate from grant funding (Dreher, 2005).

### Aging Faculty

The clinical nurse faculty shortage is compounded by the growing number of faculty retirements. According to the Pennsylvania Department of Health's *State Health Improvement Plan Special Report on the Characteristics of the Registered Nurse Population in Pennsylvania: Combined Data from the Survey of Registered Nurses Renewing Licenses in April 2004, October 2004, April 2005, October 2005* the mean age of RN credentialed faculty is between 49 and 51 years. The following table shows a breakdown of mean faculty ages by type of program.

Table 7: Mean Age of Faculty by Program Type in 2004 and 2005

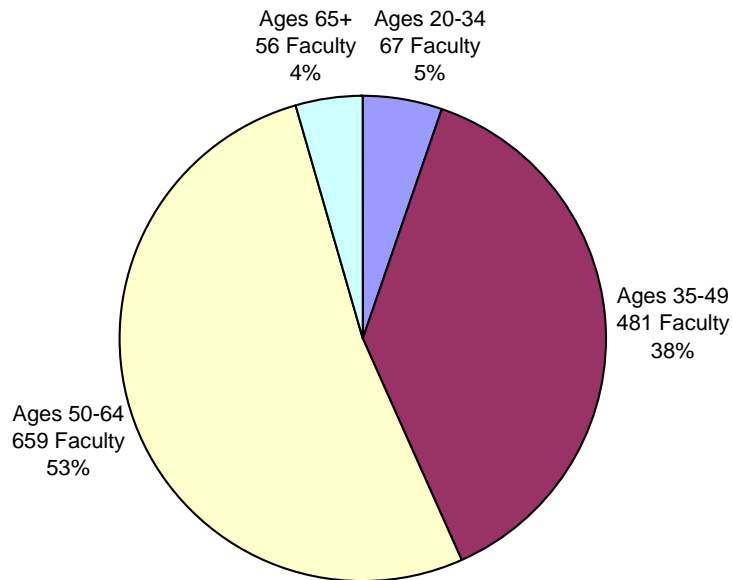
| Program Type  | Mean Age (years) |
|---------------|------------------|
| LPN           | 51.1             |
| Diploma       | 49.8             |
| Associate's   | 49.9             |
| Baccalaureate | 50.9             |

\* Pennsylvania Department of Health, (State Health Improvement Plan Special Report on the Characteristics of the Registered Nurse Population in Pennsylvania: Combined Data from the Survey of Registered Nurses Renewing Licenses in April 2004, October 2004, April 2005, October 2005)

Data regarding the age distribution of faculty in Pennsylvania nursing programs indicate more than half of Pennsylvania nurse faculty members will be eligible for retirement in less than 15 years.

Figure 2: Age Distribution of Faculty Teaching in LPN, Diploma, Associate's, and Baccalaureate Programs in 2004 and 2005

n = 1,263



\* Pennsylvania Department of Health (State Health Improvement Plan Special Report on the Characteristics of the Registered Nurse Population in Pennsylvania: Combined Data from the Survey of Registered Nurses Renewing Licenses in April 2004, October 2004, April 2005, October 2005)

## Implications of the Faculty Shortage

In addition to limiting the number of students nursing programs can serve (see Ability to Accommodate Qualified Applications section), faculty shortages may lead educational institutions to rely on part-time and adjunct faculty and on nurses who are in process of completing their graduate degrees to fill classroom and clinical needs.

## Educational Requirements for Faculty

The Pennsylvania State Board of Nursing is charged with establishing the requirements for nursing faculty members at the prelicensure level of nursing education. Nurse educators in LPN programs must hold at least a baccalaureate degree, while nurse educators in diploma, associate's, and bachelor's degree programs must hold at least a master's degree in nursing (49 Pa.Code 21). Educators with less than a master's degree may be employed if qualified candidates are not available for a maximum of five years while pursuing a graduate degree in nursing. Faculty members teaching in master's, doctoral, and post-doctoral programs typically hold a doctoral degree. Some institutions also require faculty to complete one to three years of post-doctoral work prior to teaching in master's, doctoral, or post-doctoral programs (Dreher, 2005) (See Table 8).

The nurse educator shortage is prompting many schools to allow students currently pursuing a required degree to serve as assistant faculty members. The Pennsylvania Department of Health's *State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on Data from Nursing Education Program Annual Reports, 2004* data show that 37 percent of faculty teaching in associate's degree programs and 20 percent of faculty teaching in diploma programs do not have the required master's degree. Approximately 10 percent of faculty members teaching in baccalaureate degree programs and LPN programs also do not hold the required degrees.

Past AACN President Carole Anderson stated that faculty members should have at least one degree higher than their students to guide students appropriately in utilizing research findings, conceptualizing problems, and synthesizing knowledge (AACN Issue Bulletin, 1999). Professional organizations such as the AACN advocate for the use of doctoral-prepared nurse educators at all levels.

The AACN publication *Faculty Shortages in Baccalaureate and Graduate Nursing Programs: Scope of the Problem and Strategies for Expanding Supply* (2003) and DeYoung, Bliss, and Tracey's article, *The Nursing Faculty Shortage: Is There Hope?* (2002), acknowledge that master's-prepared faculty are essential to clinical education, because most doctoral faculty members prefer to dedicate their time to research. Educational institutions must balance the number of doctoral- and master's-prepared faculty in their nursing programs. However, there is little information available regarding the best mix of faculty education levels. Further research should be conducted to determine the most ideal ratio of doctoral- and master's-prepared faculty.

Table 8: Educational Requirements of Pennsylvania Nurse Faculty

| <b>Degree Program</b>                                | <b>Minimum Faculty Educational Level</b>   | <b>Faculty Requirements</b>   | <b>Exceptions</b>  |
|--|--|---|--|
| LPN Programs   | Baccalaureate degree, with additional preparation appropriate to the teaching of practical nursing | <ul style="list-style-type: none"> <li>• Current license in the Commonwealth</li> <li>• Nursing experience involving direct patient care or teaching experience within 2 years of employment</li> <li>• Maintain experience in clinical and functional areas of responsibility</li> </ul> | Faculty or instructors with less academic preparation may be employed if qualified personnel are not available provided that less qualified faculty and instructors shall function under the direct guidance of a fully qualified faculty member and shall give evidence of continuing their academic preparation. |
| Diploma, Associate and Baccalaureate Degree Programs | Master's degree relevant to clinical and/or functional areas of responsibility                     | <ul style="list-style-type: none"> <li>• Current license in the Commonwealth</li> <li>• Maintain experience in clinical and functional areas of specialization</li> </ul>   | Educators with less than a master's may be employed if qualified candidates are not available. They may function as assistants to fully qualified faculty members for a maximum of five years. Assistants must have a minimum of a BSN and give evidence of actively pursuing a master's degree in nursing.        |
| Master's, Doctoral, Post-Doctoral Programs           | Typically hold a doctoral degree   | <ul style="list-style-type: none"> <li>• Current license in the Commonwealth</li> <li>• Maintain experience in clinical and functional areas of specialization</li> <li>• Some institutions require a 1-3 year post-doctoral, research-intensive experience</li> </ul>                    | Some faculty members in graduate programs may hold a master's degree. The Pennsylvania Code does not include specific regulations regarding faculty teaching in master's, doctoral, or post-doctoral programs.   |

\*LPN (49 Pa.Code 21.192), Diploma (49 Pa.Code 21.74), Associate and Baccalaureate Programs (49 Pa.Code 21.71), and Master's, Doctoral, and Post-doctoral Programs (Dreher, 2005)

## Increasing Reliance on Part-Time and Adjunct Faculty

The Pennsylvania Department of Health's *State Health Improvement Plan Report on the Status of Nursing Education Programs: A Report on Data from Nursing Education Program Annual Reports, 2004* indicated that part-time faculty usage grew between 1999 and 2004. These data include all faculty teaching in RN programs at the diploma, associate's, and bachelor's degree levels as well as LPN programs. Full-time faculty usage increased 27 percent from 1999 to 2004. During the same five-year period, part-time faculty usage increased 134 percent. In 2004, more part-time faculty were teaching in the Commonwealth's nursing programs than full-time faculty (Table 9). The National League for Nursing's *Nurse Educators 2006: A Report of the Faculty Census Survey of RN and Graduate Programs* indicates that Pennsylvania trends follow similar national trends in which the percentage of part-time faculty is increasing more rapidly than full-time faculty.

Table 9: Pennsylvania Full-Time and Part-Time Faculty Usage 1999-2004

| Faculty   | 1999  | 2000  | 2001  | 2002  | 2003  | 2004  | % Increase from 1999-2004 |
|-----------|-------|-------|-------|-------|-------|-------|---------------------------|
| Full-Time | 1,070 | 1,064 | 1,121 | 1,130 | 1,237 | 1,354 | 27%                       |
| Part-Time | 615   | 660   | 771   | 913   | 1,268 | 1,437 | 134%                      |

\* Pennsylvania Department of Health (State Health Improvement Plan Report on the Status of Nursing Education Programs: A Report on Data from Nursing Education Program Annual Reports, 2004)

RN-diploma, RN-associate's, RN-bachelor's, and LPN programs also use full- and part-time faculty differently. In 2004, RN preparation programs offering a baccalaureate degree or diploma used more full-time faculty than part-time faculty. However, RN programs offering an associate's degree and LPN programs used more part-time faculty than full-time faculty. See Table 10 for a breakdown of full- and part-time faculty usage by program type.

Table 10: Pennsylvania Full-Time and Part-Time Nursing Faculty in 2004

| Program Type   | Full-Time Faculty | Part-Time Faculty | Total        |
|----------------|-------------------|-------------------|--------------|
| LPN            | 211               | 360               | 571          |
| RN-Diploma     | 270               | 92                | 362          |
| RN-Associate's | 317               | 477               | 793          |
| RN-Bachelor's  | 556               | 508               | 1,064        |
| <b>Total</b>   | <b>1,354</b>      | <b>1,437</b>      | <b>2,791</b> |

\* Pennsylvania Department of Health (State Health Improvement Plan Report on the Status of Nursing Education Programs: A Report on Data from Nursing Education Program Annual Reports, 2004)

These data show that part-time faculty usage is growing; however, there is little information regarding the appropriate ratio of full-time to part-time faculty. There is a strong possibility that many full-time faculty are doctoral-prepared, because full-time faculty often are engaged in scholarly activities (Dreher, 2005). Part-time faculty focus most of their time on teaching students, since master's degree programs in nursing

education are focused on clinical and classroom teaching techniques. More research must be completed to test this hypothesis and determine what qualifies as an appropriate mix of full- and part-time faculty.

There are several advantages and disadvantages to using part-time faculty to alleviate the nurse educator shortage (Table 11). All stakeholders benefit from part-time clinical faculty who teach in their respective health care organizations. These individuals are well-versed in the organization's policies, and they have preexisting relationships with clinical staff and administrators. Educational institutions benefit from part-time arrangements because they can create ideal student-to-faculty ratios at a low cost. Part-time faculty usually do not receive benefits (Maryland Statewide Commission on the Crisis in Nursing, 2004). The AACN publication *Faculty Shortages in Baccalaureate and Graduate Nursing Programs: Scope of the Problem and Strategies for Expanding Supply* (2003) also reported that some health care organizations would provide clinical faculty in exchange for research and consulting services. Part-time faculty are assets to students, because they have the opportunity to learn from practicing clinicians. Part-time faculty usually do not have a scholarly research requirement, so they can focus on student development and assistance (Maryland Statewide Commission on the Crisis in Nursing, 2004).

Clinicians benefit from part-time appointments because they usually receive competitive pay from health care institutions while supplementing their income by contributing to the preparation of the next generation of nurses. Part-time faculty members appreciate student enthusiasm, especially if they work in short-staffed clinical settings (Nurses for a Healthier Tomorrow, 2004). Additionally, part-time appointments allow clinicians to explore teaching while remaining in their current jobs. H. Michael Dreher of Drexel University's College of Nursing and Health Professions stated that new master's-prepared nursing faculty typically begin teaching part-time or as an adjunct clinical faculty member in an associate's-degree nursing program. Part-time clinical positions typically require six to seven hours of clinical supervision per week with six to ten students (Dreher, 2005). Clinicians who have positive experiences teaching part-time may consider full-time faculty positions.

Some professionals and organizations acknowledge the need for part-time appointments, but are concerned about the extent to which part-time faculty are used. Dr. Ada Sue Hinshaw stated in *A Continuing Challenge: The Shortage of Educationally Prepared Nursing Faculty* (2001) that part-time faculty usage may compromise the three-fold purpose of an academic career: teaching, research, and professional service. Research and professional service are essential to staying current in the field, adopting new technology, and developing innovative practices. Part-time faculty have commitments beyond teaching; therefore, they are not as accessible to students. They have limited office hours, if any.

Table 11: Advantages and Disadvantages of Full- and Part-Time Faculty

|               | Full-Time Faculty  | Part-Time Faculty   |
|---------------|--|---|
| Advantages    | <ul style="list-style-type: none"> <li>• Receive benefits such as vacation, sick time, etc. from the educational institution</li> <li>• Dedicated to the three-fold purpose of an academic career: teaching, research, and professional service</li> <li>• Often possess formal education in educational delivery and previous teaching experience</li> <li>• Provide seamless clinical instruction and make ongoing improvements to nursing programs</li> </ul> | <ul style="list-style-type: none"> <li>• Individuals who teach in their healthcare institutions are aware of policies and have relationships with staff and administrators</li> <li>• Cost-effective way to boost clinical faculty capacity and lower student-to-faculty ratios</li> <li>• Healthcare institutions can have clinicians teach in exchange for research and consulting services</li> <li>• Students have the opportunity to learn from practicing clinicians</li> <li>• Clinicians receive competitive pay from health care institutions and contribute to the preparation of the next generation of nurses</li> <li>• Individuals benefit from supplementary income</li> </ul> |
| Disadvantages | <ul style="list-style-type: none"> <li>• Not enough full-time faculty in the field</li> <li>• Some do not have the required degrees (e.g. doctoral degrees)</li> <li>• Those with doctoral degrees may prefer to conduct research over teaching</li> <li>• Lack competitive compensation</li> </ul>  | <ul style="list-style-type: none"> <li>• Often do not have formal education or experience in teaching, which may negatively affect educational quality and patient safety</li> <li>• Educational institutions must spend time and money to prepare part-time faculty for their roles</li> <li>• Higher turnover caused by clinical practice obligations, teaching at multiple educational institutions, and semester-by-semester contracts</li> <li>• May not be as accessible to students (e.g. limited or no office hours)</li> </ul>   |

\* AACN, 2003 (Faculty Shortages in Baccalaureate and Graduate Programs: Scope of the Problem and Strategies for Expanding the Supply); Dreher, 2005; AACN Issue Bulletin, 1999; DeYoung, Bliss, and Tracey, 2002; Hinshaw, 2001; and Maryland Statewide Commission on the Crisis in Nursing, 2004

Furthermore, part-time faculty usually do not have formal education or experience in teaching (AACN Issue Bulletin, 1999). Graduate coursework in nursing education prepares faculty members to determine the best approaches to teach specific skills, utilize various learning theories, and create evaluation processes (University of Texas, 2006). Educational institutions must prepare part-time faculty members for their new roles, especially considering that faculty are responsible for patient safety and high-quality instruction.

In addition, the Pennsylvania Department of Health *State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on Data from Nursing Education Program Annual Reports, 2004* indicated that part-time faculty in RN and LPN programs had an 8 to 12 percent higher turnover rate than full-time faculty. This is what Ellen Pfadt, Assistant Professor and Assistant Chair, at Edinboro University School of Nursing calls “the revolving door effect.” This noteworthy difference in turnover could be caused by individual employment in clinical practice, teaching at multiple educational institutions, and the uncertainty of semester-by-semester contracts

(Maryland Statewide Commission on the Crisis in Nursing, 2004). Part-time faculty usage is a practical, short-term strategy to expand faculty capacity. In the long run, more full-time faculty are needed to provide seamless clinical instruction and to make ongoing improvements to nursing programs.

One potential strategy to increase the quality of instruction that preceptors, part-time, contracted, and adjunct faculty provide is to create preceptor and faculty coordinator positions. Educational institutions, regions, or states can hire coordinators to train, orient, and mentor preceptors and faculty. In addition, some educational institutions are hiring laboratory coordinators to orient faculty to new technology and oversee student experiences with simulations. Preceptor and faculty coordinator positions are emerging; however, more funding is needed to supplement salaries.

### Novice Nursing Professionals May Find the Transition to Work Difficult

Clinical educators are responsible for their students and for the patients whom the students provide care. Nursing shortages mean that clinical educators will supervise more students who are caring for more patients. For example, a clinical nurse educator may be supervising students with assignments on different floors or wings (AACN Issue Bulletin, 1999). They often are not able to immediately assist students.

Novice nursing professionals may find the transition from controlled classroom environments to noncontrolled work settings difficult. The National Council of State Boards of Nursing (NCSBN) *Report of Findings From the 2001 Employer's Survey* stated that novice nurses and their employers felt that entry-level nurses were not well prepared for their jobs. Employers indicated that new nurses were least prepared to handle emergency situations, supervise patient care provided by others, and perform psychomotor skills. The nursing faculty shortage may produce a higher number of students who lack confidence in their skills and hold negative attitudes toward the profession. Novice nurses may experience high stress levels and anxiety regarding their responsibility for the health of other individuals (Joint Commission on Accreditation of Healthcare Organizations, 2002).

Moreover, health care organizations have significantly cut the time spent orienting new hires. The Joint Commission on Accreditation of Healthcare Organizations reported in *Healthcare at the Crossroads: Strategies for Addressing the Evolving Nursing Crisis* (2002) that entry-level nurses receive 30 days of training. In 1997, nurses were trained for three months. Negative clinical experiences and a lack of on-the-job training can drive turnover and compromise patient safety.

Nurse educators have proposed a variety of strategies to mitigate the effects of the faculty shortage on novice nurses. For example, Dr. Patricia Benner is widely recognized for her book, *Novice to Expert*. Benner created a five-stage model of clinical competence which helps educators and practitioners to understand and support the needs of nurses at all experience levels. Table 12 describes Benner's five stages.

Table 12: Benner's Stages of Clinical Competence

| Stage             | Description  |
|-------------------|--|
| Novice            | <ul style="list-style-type: none"> <li>• Has little past experience dealing with a variety of clinical situations</li> <li>• Relies on rules and “book knowledge” to guide performance</li> </ul>  |
| Advanced Beginner | <ul style="list-style-type: none"> <li>• Has enough experience to note recurring, meaningful clinical situations</li> <li>• Begins to use experience to guide performance</li> </ul>   |
| Competent         | <ul style="list-style-type: none"> <li>• Has two to three years of experience dealing with similar clinical situations</li> <li>• Begins to see personal actions in terms of long-range goals</li> <li>• Lacks speed but can manage the aspects of clinical nursing</li> </ul> |
| Proficient        | <ul style="list-style-type: none"> <li>• Has a holistic understanding of nursing</li> <li>• Knows what typical events to expect in clinical situations, and understands nuances not readily apparent to less experienced nurses</li> </ul>                                     |
| Expert            | <ul style="list-style-type: none"> <li>• Has a significant level of clinical experience</li> <li>• Uses intuition to understand clinical situations without wasteful consideration of a large range of unfruitful, alternative diagnoses and solutions</li> </ul>              |

\* Benner, 1984 and Nolan, 2006

## Motivating Students to Become Faculty

### Recommendation 3

#### **Develop practices to motivate nursing students and experienced nurses to become nursing faculty**

##### Suggested Strategies:

- Establish mentoring programs that encourage experienced nurses and nursing students to pursue advanced degrees, academic careers, and faculty positions
- Create opportunities that expose nursing students and experienced nurses to the nurse faculty role
- Support initiatives to attract historically underrepresented populations to pursue faculty positions
- Encourage succession planning to ensure strong nursing leadership in academic settings

There are a variety of ways to motivate nursing students to become nurse faculty. Nursing students may serve as classroom assistants or “preceptors” to less experienced students. In addition, faculty can serve as mentors through advising students on career options, engaging students in scholarly research, and encouraging students to attend or present at professional conferences.

Some institutions, such as the University of Arizona, allow students to assist classroom, lab, or clinical instructors. These “student preceptors” do not serve as content experts, but they help students complete laboratory work and patient studies. “Student preceptors” also may hold office hours, one-on-one student tutoring sessions, and exam reviews (University of Arizona, 2005). In addition, Emory University (Atlanta, Georgia) incorporates student teaching during clinical education experiences. Students must identify the need for an in-service opportunity for staff nurses. The students design and deliver a professional development session as part of the clinical experience under the supervision of a faculty member (Lunday, 1999).

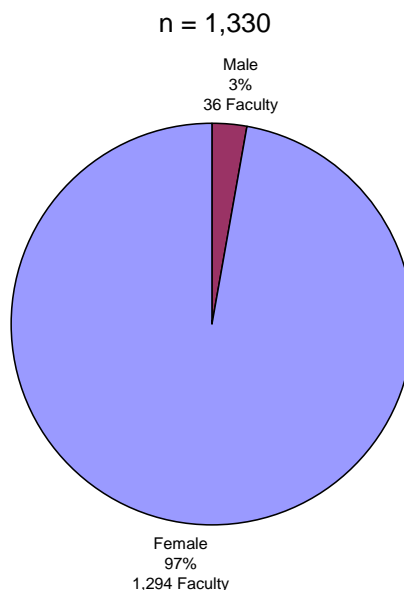
Other examples of faculty-student mentoring include participating in scholarly research and presenting at professional conferences (Bryne, 2004 & Shere, 2004). Research opportunities typically are available at the graduate level; however, undergraduate research opportunities can enhance student interest in pursuing nurse faculty positions. For example, nursing students at Indiana University conducted research on hypertension and dietary supplements. The students chose research jobs because they could be compensated better for career-related research positions than other on-campus employment. These research projects gave students the opportunity to conduct interviews and screenings with individuals on campus and in the community. Undergraduate research is a successful way to encourage graduate study in nursing. It gives students prior experience with research methods, as well as a chance to become published during the early stages of their academic careers (Shere, 2004).

### Males and Racial and Ethnic Minorities in Nursing Education

Caucasian females comprise the majority of nurses, while males and racial and ethnic minorities are underrepresented. The Health Resources and Service Administration's *2004 National Sample Survey of Registered Nurses* indicated 94.3 percent of RNs in the United States are female, while 5.7 percent of nurses are male.

The following figure illustrates the distribution RN credentialed males and females in nursing faculty roles in Pennsylvania. RN credentialed males teaching in nursing programs comprise approximately 3 percent of faculty.

Figure 3: Gender Distribution of RN Credentialed Faculty Teaching in LPN, Diploma, Associate's, and Baccalaureate Nursing Programs in 2004 and 2005



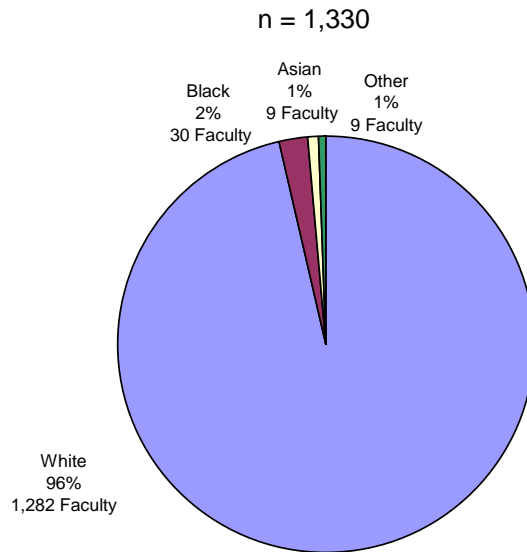
\* Pennsylvania Department of Health (State Health Improvement Plan Special Report on the Characteristics of the Registered Nurse Population in Pennsylvania: Combined Data from the Survey of Registered Nurses Renewing Licenses in April 2004, October 2004, April 2005, October 2005)

Male nurses often encounter discrimination (Carol, 2006). Gender biases remain in textbooks as the nurse is often referred to as “she.” Some students also express concern that nursing is taught in a way that reflects typically female norms, attitudes, and communication styles (Carol, 2006).

Several organizations and publications support male nurses. For example, the American Assembly for Men in Nursing (AAMN) offers awards such as the “Best Place to Work for Male Nurses” and “Best School for Male Nursing Students” (AAMN, 2006). *Male Nurse Magazine* also acts as a clearinghouse of information for male nurses.

Nurses of minority racial and ethnic backgrounds also comprise a small portion of nursing faculty. The National League for Nursing’s *Nurse Educators 2006: A Report of the Faculty Census Survey of RN and Graduate Programs* (2006) stated that 90 percent of full-time nurse educators in the United States are white, 7 percent are African-American, 1.9 percent are Asian, and 1.5 percent are Hispanic. The *State Health Improvement Plan Special Report on the Characteristics of the Registered Nurse Population in Pennsylvania: Combined Data from the Survey of Registered Nurses Renewing Licenses in April 2004, October 2004, April 2005, October 2005* indicated approximately 4 percent of faculty are of minority racial and ethnic backgrounds (Figure 4).

Figure 4: Racial and Ethnic Distribution of Faculty Teaching in LPN, Diploma, Associate’s, and Baccalaureate Nursing Programs in 2004 and 2005



\* Pennsylvania Department of Health (State Health Improvement Plan Special Report on the Characteristics of the Registered Nurse Population in Pennsylvania: Combined Data from the Survey of Registered Nurses Renewing Licenses in April 2004, October 2004, April 2005, October 2005)

Several organizations encourage the attraction and retention of racial and ethnic minorities in the nursing field. Five associations formed the National Coalition of Ethnic Minority Nurses Associations (NCEMNA) in 1998. NCEMNA member organizations include: Asian American/Pacific Islander Nurses Association, National Alaska Native

American Indian Nurses Association, National Association of Hispanic Nurses, National Black Nurses Association, and the Philippine Nurses Association of America. This coalition has published five white papers on the status of ethnic minorities in health care and recommendations for nursing research in *Nursing Outlook*.

In addition, NCEMNA has developed a research and training agenda related to eliminating health disparities and increasing the pipeline of minority nurse investigators (NCEMNA, 2006). Likewise, Minoritynurse.com is a clearinghouse of information on how to recruit minorities more effectively (including males and racial and ethnic minorities) into nursing education programs. It also recognizes organizations and states that have designed reward and recognition programs for nurses engaged in educating minority populations.

## Preceptorships

### Recommendation 4

#### **Create and support clinical preceptor development programs for nursing students**

##### Suggested Strategies:

- Create incentives for health care entities to work collaboratively with nursing education programs in the development of nursing student preceptor programs
- Create incentives and rewards for individuals who want to serve as student nurse preceptors
- Develop a statewide on-line module that provides basic teaching resources for use by clinical preceptors

Clinical preceptors can play an important role in the novice nurse's transition to practice. Preceptors usually work one-on-one with nursing students or recent graduates. They increase retention of new nurses and provide experienced nurses the opportunity to teach and mentor (Beaufort Memorial Hospital, 2006). Nurses interested in serving as preceptors may not have previous teaching experience. Therefore, it is important to provide preceptors with teaching resources and high-quality orientation programs. At least 11 states<sup>2</sup>, not including Pennsylvania, also have established credential requirements for preceptors (Pennsylvania Center for Health Careers, 2006).

Clinical settings and educational institutions have created a variety of preceptor development programs. For example, the University of Texas at El Paso and El Paso Community College have jointly developed an online preceptor training course. The course helps new preceptors to identify characteristics of an effective preceptor, relate preceptor responsibilities to student learning and success, analyze how principles of communication apply to preceptorship, and describe how Patricia Benner's *Novice to Expert* theory applies to being a preceptor. Online training allows educational institutions to orient many preceptors at once, and preceptors can complete the training at their own pace (University of Texas at El Paso and El Paso Community College, 2006).

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<sup>2</sup> Colorado, Connecticut, Georgia, Louisiana, Minnesota, Missouri, Nebraska, North Dakota, South Carolina, South Dakota, and Utah

Another successful example of preceptor training is a statewide initiative titled the Vermont Nurse Internship Project (VNIP). Under the direction of Dr. Susan Boyer, VNIP provides standardized preceptor training to existing RNs to help them improve skills in teaching, coaching, mentoring, leadership, communication, and evaluation. The training also is designed to change the culture of the work environment to make the transition to work more successful for new nurses. Boyer develops preceptor training curricula, coordinates six workshops per year, monitors stakeholder needs, and maintains program funding. She also developed a preceptor credentialing program to recognize and reward preceptors who have completed training.

VNIP provides services to five nursing schools, 16 acute care hospitals, and numerous other health care agencies. Since 1999, more than 1,300 direct care providers have attended the preceptor training. Accurate data regarding the number of students the internship and preceptor training programs have influenced is not yet available. In addition, anecdotal evidence shows that VNIP's programs are improving student and preceptor retention. Retention of preceptors who completed the program in 1999 was 75 percent, while the two-year retention rate of the interns, once hired, was 93 percent. More outcomes data will be available once the National Council of State Boards of Nursing (NCSBN) completes its study on this model (Boyer, 2006).

## CLINICAL SITES

Clinical education gives students the opportunity to apply knowledge learned in the classroom to the care of real or simulated patients in settings closely monitored by experienced nurse faculty. Policy makers and practitioners are concerned about the availability of clinical sites, the quality of experience students receive at sites, and how these circumstances affect the supply of nurses.

The Board collects clinical education data through its Agency Data Form; however, this information is not made available in aggregate form. Therefore, it is difficult to know whether the Commonwealth has an abundance or dearth of clinical sites. Despite a lack of empirical data regarding clinical education sites, a general consensus indicates a need for more sites. The PCHC recommended that the Commonwealth maximize the use and availability of clinical sites in its October 2004 report *Addressing Pennsylvania's Nursing Education System Capacity*. The Clinical Education Task Force proposes the following recommendation to build on the PCHC's previous initiatives.

### Recommendation 5

#### **Develop a Commonwealth-wide clinical site database to maximize the availability and use of clinical sites**

##### Suggested Strategies:

- Work with the Pennsylvania State Board of Nursing to determine the desirability and feasibility of developing a Commonwealth-wide clinical site database for nursing and allied health professions (e.g. the Oregon *StudentMAX* model)
- Conduct a regional pilot project to inventory available clinical sites
- Revise the Pennsylvania State Board of Nursing Agency Data Form to make the information it collects more accessible
- Promote the use of clinical sites outside of the traditional hospital setting that support nursing education objectives

The need for a centralized clinical site database is evident when the following three key issues are examined:

- Pennsylvania's clinical education requirements
- Competition for Commonwealth clinical sites
- Clinical site demand

### Clinical Education Requirements

The Pennsylvania State Board of Nursing is the regulatory body that approves nursing education programs and licenses nurses in the Commonwealth. The Board has established general guidelines for clinical sites, and individual educational institutions develop their clinical experiences based on programmatic needs. The Board's Agency Data Form could be used to establish clinical education standards and analyze the current capacity of clinical sites (Appendix D). Each Board-approved nursing education program must complete this form prior to approval. They must list information including the names of educational programs using the facility, specific clinical areas, average

daily patient census, average number of students assigned to the site at one time, and faculty-to-student ratios.

Many state boards of nursing have specific guidelines regarding clinical education components and instructional hour requirements. At least 13 states<sup>3</sup> require specific clinical education concentrations, most often including maternal, pediatric, mental, medical-surgical, geriatric, and adult health (Pennsylvania Center for Health Careers, 2006). States such as Arizona and West Virginia use competency models and outcomes to ensure students have adequate preparation in a variety of clinical areas (Appendix E).

The Commonwealth of Pennsylvania requires students in LPN programs to complete clinical experiences in “the care of patients with simple nursing needs, the care of patients with short-term nursing needs, and the care of patients with long term nursing needs” (49 Pa. Code 21.203.d3.i-iii) and “in the care of men, women and children in a variety of age groups with health programs characteristic of the age group involved” (49 Pa. Code 21.203.d.4). The Commonwealth of Pennsylvania requires students in RN programs to complete clinical experiences in “the care of men, women and children in age groups and with the health problems characteristic of each group. Experiences shall be provided which include preventive aspects of nursing care during acute and chronic illness and rehabilitative care. Opportunities shall be provided for the student to participate in case findings, health teaching and health counseling for patients and their families. Evening and night assignments are considered part of the curriculum only in terms of the objectives to be achieved and if faculty supervision is provided.” (49 Pa. Code 21.81.e). The implementation of these requirements is determined by individual educational institutions.

Ten states<sup>4</sup> have minimum hour requirements for clinical and/or theoretical instruction (Pennsylvania Center for Health Careers, 2006). Pennsylvania LPN programs require a minimum of 1500 hours. The Board recommends 600 theoretical hours and 900 clinical hours. No such regulations or recommendations exist for Commonwealth RN programs.

## Competition for Clinical Sites

The Commonwealth currently collects general information regarding the use of clinical sites by educational institutions. This information is compiled in the *State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on the Data from Nursing Education Program Annual Reports, 2004*. Questions regarding clinical education have been included in this report during the last few years. Information collected for this report is improving continually; however, policy makers must have more data regarding the extent of the clinical site shortage. This information will help educational institutions and policy makers to develop targeted initiatives to address the shortage.

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<sup>3</sup> Arizona, California, Delaware, Florida, Iowa, Michigan, Nevada, Oklahoma, South Dakota, Tennessee, Texas, Washington, and West Virginia

<sup>4</sup> Colorado, Connecticut, Georgia, Kentucky, Massachusetts, North Carolina, Pennsylvania, Tennessee, Texas, and West Virginia

The *State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on the Data from Nursing Education Program Annual Reports, 2004* indicated that 80 percent of baccalaureate and 76 percent of associate degree programs have difficulty obtaining clinical sites. In addition, 23 percent of diploma programs and 36 percent of LPN programs have experienced challenges finding clinical sites. Clinical sites in pediatrics were the most difficult to obtain, followed by obstetrics, psychiatry, and medical-surgical according to the survey respondents (Table 13).

Table 13: Number and Percentage of Commonwealth Nursing Education Programs that Indicated Difficulty in Obtaining Clinical Sites for Student Experience by Areas of Clinical Practice in 2004

| Program               | Baccalaureate | Associate | Diploma | Practical Nursing (LPN) |
|-----------------------|---------------|-----------|---------|-------------------------|
| Pediatrics            | 20 (80%)      | 16 (80%)  | 3 (60%) | 12 (71%)                |
| Obstetrics            | 17 (68%)      | 11 (55%)  | 2 (40%) | 9 (53%)                 |
| Psychiatry            | 10 (40%)      | 6 (30%)   | 1 (20%) | 3 (18%)                 |
| Medical-Surgical      | 4 (16%)       | 5 (25%)   | 0 (0%)  | 5 (29%)                 |
| Community Health      | 6 (24%)       | 1 (5%)    | 1 (20%) | 0 (0%)                  |
| Critical Care         | 1 (4%)        | 1 (5%)    | 0 (0%)  | 1 (6%)                  |
| Total with Difficulty | 25 (76%)      | 20 (8%)   | 5 (23%) | 17 (36%)                |

\* PA Department of Health (State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on the Data from Nursing Education Program Annual Reports, 2004)

Anecdotal evidence taken from the March 25, 2006 Student Nurses of Pennsylvania (SNAP) Board meeting indicated that students in hospital-based nursing programs do not face the same competition for clinical sites as their counterparts at colleges and universities. Danielle Calabrese, the former SNAP Board President, reported that hospital-based nursing programs have less difficulty finding clinical sites due to the connection these programs have with hospitals.

The *State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on the Data from Nursing Education Program Annual Reports, 2004* indicated that fierce competition for clinical sites (overuse of facility/use by several other programs) was the most significant contributor to clinical site shortages. The report also indicated that decreased census/length of stay and closure/downsizing of clinical units moderately influenced the clinical site shortage, while insufficient staff at facilities and distance to facilities had the least influence (Table 14).

Table 14: Factors Contributing to Difficulty Obtaining Clinical Sites as Indicated by Commonwealth Nursing Programs in 2004

| Program       | Overuse of Facility | Closure/ Downsizing of Clinical Units | Decreased Census or Length of Stay | Insufficient Staff at Facility | Distance to Facility |
|---------------|---------------------|---------------------------------------|------------------------------------|--------------------------------|----------------------|
| Baccalaureate | 1.42                | 2.00                                  | 2.75                               | 4.00                           | 4.77                 |
| Associate     | 1.84                | 3.21                                  | 2.22                               | 4.53                           | 4.44                 |
| Diploma       | 1.45                | 1.86                                  | 2.43                               | 4.00                           | 3.75                 |
| LPN           | 1.61                | 2.70                                  | 2.30                               | 4.17                           | 4.54                 |

Factors were rated on a scale of 1 = “most significant” to 6 – “least significant”

\* PA Department of Health (State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on the Data from Nursing Education Program Annual Reports, 2004)

The Board does not regulate out-of-state usage of in-state clinical sites. However, anecdotal evidence indicates that educational institutions compete with neighboring states for clinical sites. Telephone interviews in March 2006 with two clinical directors of schools of nursing in western Pennsylvania — one a State System of Higher Education institution and the other a community college — indicated competition from New York and Ohio in placing their students in clinical sites in Pennsylvania.

### Determining Clinical Site Demand

Determining the demand for Commonwealth clinical sites is a challenge because clinical educational requirements are developed by each educational institution and vary from program to program. The Board requires LPN students to complete a minimum of 1500 educational hours. It recommends at least 600 theory hours and 900 clinical hours for LPN programs (49 Pa.Code 21.203.8e). The Pennsylvania Department of Health's *State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on the Data from Nursing Education Program Annual Reports, 2004* indicated that students in LPN programs complete an average of 685 theory hours and 865 clinical hours.

No such requirements, regulations, or monitoring exist in Pennsylvania for RN programs. Therefore, the amount of time RN students spend in clinical instruction is not ascertained easily. A web search of each community college and SSHE university offering a nursing degree indicated that no schools explicitly state the total number of hours a nursing student must spend in theory or clinical instruction.

Likewise, more publicly available information is needed regarding institutional use of specific clinical sites and the volume of students each site serves. This information is vital to understanding the extent of the clinical site shortage and will influence recommendations to increase the capacity of clinical sites. One potential way to better understand the supply of and demand for clinical sites is to create and implement a Commonwealth-wide clinical site database. This interactive database would allow educational institutions to match their students with clinical sites on a semester-by-semester basis. In addition, it can provide valuable data to policy makers, particularly the State Board of Nursing.

Regional and statewide databases have been implemented in other states, including California and Oregon. Oregon's centralized clinical placement system, *StudentMax*, is marketed throughout the country. It provides timely information regarding clinical site openings through a publicly hosted Internet database (Oregon Center for Nursing, 2003). In May 2005, the Bay Area Nursing Resource Center launched the Bay Area Centralized Clinical Placement System (CCPS). Similar to the *StudentMax* software package, the CCPS is an Internet-based package designed to link students to clinical placements.

## HEALTH CARE TECHNOLOGY

Health educators increasingly rely on varying forms of technology to aid in instructing new generations of health care professionals. Advancements in the sophistication of technology make it an important tool for clinical education. Technology allows nursing students to practice standardized skills in a controlled environment. This minimizes risk and maximizes the positive outcomes of clinical education such as increased confidence, competency, and collaboration.

Technology is expanding quickly to meet the need of high-quality, professional education for health care clinicians. Meanwhile, the need for quality control is increasing and the cost of implementation is dropping. Technology may be a promising strategy for increasing and better accommodating students in nursing education programs while adapting to the changing dynamics of clinical settings.

The following recommendation supports the integration of technology in nursing education to increase the quality and availability of clinical experiences:

### Recommendation 6

#### **Support the use of current and future clinical education technologies and simulated learning in nursing education**

##### Suggested Strategies:

- Provide financial support to create and maintain a central repository to share best practices; available funding opportunities; and promote education-focused forums
- Support the facilitation of regional partnership efforts that promote the use and sharing of health care technologies across educational institutions and/or practice settings
- Support the integration of technology into the nursing curriculum, particularly where it can supplement the clinical experiences in economically distressed and rural areas
- Create opportunities that assist nursing education programs to provide for a coordinator to manage and integrate simulation technology into the curriculum
- Support initiatives that foster faculty development in the use and/or application of different technologies in nursing and interdisciplinary professional education

While the Clinical Education Task Force (Task Force) recognizes that there are many forms of technology utilized in the field of nursing, it focuses on three major areas of health care technology for this report: simulation, distance/web-based learning, and videoconferencing. A more comprehensive list of health care technology is available in Appendix G.

### Simulation

Simulation is a supplement to classroom theory and traditional clinical education. Experts suggest that simulation may enhance traditional clinical education, easing the flow of students to clinical placement sites and ultimately allowing for a higher capacity of nursing students. Simulation also provides a holistic approach to learning. Students are able to grasp what it may be like to work with a real patient by experiencing the interaction of multiple systems and their complex linkages. Rare and severe medical

situations that students may not encounter in traditional rotations also can be practiced. Learning takes place in a controlled environment which can be paused, integrated, videotaped, and self-paced. Errors can be corrected and discussed immediately to the benefit of the individual student and the whole class. The hands-on experience of simulation provides an atmosphere that encourages critical thinking, psychomotor skills, confidence in skills, and the development of communication, leadership, and delegation skills (Rauen, 2004).

In addition, simulators mitigate the lack of available patients and clinical space to meet the demand for clinical education. Human patient simulators (HPS) are computer-controlled manikins in adult, child, or infant size. Most HPS produce lung, heart, and bowel sounds; have anatomically correct pulses; and respond to medical and pharmacological interventions with expected physiological responses. They can be programmed to speak and, thus, interact with clinicians much like an actual patient (Beyea, 2004). Patient simulation technology began in 1986 when Dr. David Gaba of Stanford University and his colleagues created the first “dummy patient” (Groopman, 2005). The two major manufacturers of human patient simulators are METI and Laerdal Medical.

Approximately 300 simulation centers of differing size and complexity exist in the United States (Patow, 2005). Several are located in the Commonwealth’s traditional university-based schools of nursing and in health-system-operated schools of nursing. Villanova University, Duquesne University, and several other Commonwealth schools utilize simulation technology through pediatric and adult patient manikins. The University of Pittsburgh and Pennsylvania State University also employ the technology in several formats, and both schools have faculty who participate in leadership roles within the Society for Medical Simulation. In addition, Lancaster College of Nursing and Health Sciences is implementing simulation in its nursing program.

### Types of Simulators

Simulation technologies are classified by their fidelity – the degree of accurate reproduction (Seropian, Brown, Gavilanes, and Driggers, 2004). No standardized classification for fidelity measurement exists. Fidelity is categorized simply as low, moderate, and high (Table 15).

Low-fidelity simulators are useful for teaching and practicing psychomotor skills, but often neither look nor feel similar to a real patient (Seropian et al., 2004). Examples of low-fidelity simulators include CPR chests, IV arms, and most other virtual procedure stations that are used for teaching procedures such as bronchoscopy, colonoscopy, flexible sigmoidoscopy, and others (Patow, 2005). These stations allow students to mimic procedures commonly performed on human patients, safely and repeatedly, prior to the student performing the procedure on a human patient. Many, if not most, nursing education programs utilize low-fidelity simulators and virtual procedure stations as teaching aids.

Moderate-fidelity simulators may “breathe” or “have a pulse” but lack life-like attributes such as chest or eye movements (Seropian et al., 2004). These simulators are used to teach and master complex subject matter prior to interaction with live patients. VitalSim, manufactured by Laerdal, is an example of a moderate-fidelity simulator. It simulates

heart, breath, and bowel sounds and can run pre-programmed scenarios (Laerdal Education Products, 2006).

High-fidelity simulators replicate real patients through talking, blinking, and life-like personalities. High-fidelity units primarily are identified by their ability to react to intervention. They respond to administered drugs and student interaction. Examples of high-fidelity simulators include the Laerdal SimMan and the METI HPS-020. The HPS-020 model currently is the highest fidelity simulator on the market. High-fidelity simulation technology is new, and there are limited empirical studies which test for a measurable difference in outcomes among the use of case study, low-fidelity simulation, and high-fidelity simulation as teaching methods. One such study currently is being undertaken by the National League for Nursing (NLN) and Laerdal. The *Year Two – End of Year Report* (2006) shows that students utilizing the traditional manikin and the patient simulator felt significantly more confident in their ability to care for a postoperative client than students in the case study group. Additionally, those in the patient simulator group had a higher level of satisfaction with the teaching method as compared to the other groups. The NLN/Laerdal study concludes at the end of 2006.

Table 15: Types and Examples of Simulator Fidelity

| Fidelity | Description  | Examples  |
|----------|--|---|
| Low      | <ul style="list-style-type: none"> <li>Used for psychomotor skill practice</li> <li>Typically only an organ or part of a manikin</li> <li>No interaction with student</li> </ul>             | <ul style="list-style-type: none"> <li>CPR manikin</li> <li>IV arm</li> </ul>                         |
| Moderate | <ul style="list-style-type: none"> <li>May have vital sign functionality (breath, bowel, and pulse)</li> <li>Typically full manikin</li> <li>No response interaction with student</li> </ul> | <ul style="list-style-type: none"> <li>Laerdal VitalSim</li> <li>Nursing Kelly</li> </ul>             |
| High     | <ul style="list-style-type: none"> <li>React to intervention</li> <li>Look, talk, and respond like real patients</li> <li>Full vital functionality</li> </ul>                                | <ul style="list-style-type: none"> <li>METI LiVE</li> <li>METI HPS</li> <li>Laerdal SimMan</li> </ul> |

\* Seropian et al., 2004

### Advantages of Simulation

The primary advantage of simulation is the safety of the educational experience; there is no danger of harming a patient during learning. The simulation allows for active learning and controlled information. Students learn from each other and are assured of the same experiences. Further, it is hypothesized that learning and practice with simulations can reduce the risk to patients once the nurse begins practice. By undergoing more life-like and rigorous educational experiences, it is thought that the student will enter the workforce markedly more prepared. The National Council on State Boards of Nursing's *Report of Findings from the 2001 Employers Survey* indicated that both entry-level nurses and their employers felt entry-level nurses were not prepared to handle emergency situations, supervise patient care provided by others, and perform psychomotor skills. All of these skills are improved through increased use of simulations. The Institute of Medicine of the National Academies report *To Err is Human: Building a Safer Health System*, published in 1999, estimated that at least 44,000 people die as a result of preventable medical error each year. The group

recommended simulation experiences as a means to mitigate some of these preventable errors.

### Disadvantages of Simulation

The limitations of simulation center on its implementation and cost. In fact, the most prevalent barrier to the widespread use of patient simulation technology is the cost. High-fidelity simulators such as SimMan or HPS-020 cost \$28,000 to \$200,000. Increasing product popularity, however, has resulted in an increased number of producers in the market and a steady decrease in costs (Seropian et al., 2004).

Schools often purchase simulation technology prior to a workable plan for its strategic utilization within the educational curriculum (Seropian et al., 2004). Simulation technology is purchased as a means to increase enrollment into nursing programs and supplement limited clinical sites, without considerations to what role it should play in the structure of nursing education. Another disadvantage of simulators is that faculty must learn a new teaching strategy and must spend more time preparing for lessons (Rauen, 2004). Furthermore, such technology requires increased physical space and regular maintenance and technical support.

Additionally, simulations cannot replace real-world clinical experiences. Despite advances in technology, simulation machines will never be able to replicate the networking and mentorship experiences gained in a clinical setting. The professional experience gained by clinical education, such as professional dress, code of conduct, mannerisms, and working with people of different educational attainment, cannot be duplicated in a simulated environment.

Table 16: Advantages and Disadvantages Simulation

| Advantages  | Disadvantages  |
|---|--|
| <ul style="list-style-type: none"> <li>• Holistic representation of organ interaction</li> <li>• Rare and severe situations can be practiced</li> <li>• Mediates lack of available patients and clinical space</li> <li>• Controlled environment allows for active and reflective learning</li> <li>• Errors can be corrected and discussed immediately</li> <li>• Encourages critical thinking, confidence, leadership and team building skills</li> <li>• Enhances psychomotor and communication skills</li> <li>• All students receive the same clinical experiences</li> <li>• No patient risk</li> <li>• May mitigate human error in real patients</li> <li>• Cost dropping rapidly</li> </ul> | <ul style="list-style-type: none"> <li>• High investment cost</li> <li>• Often no vision for implementation as a complement to existing curriculum</li> <li>• Faculty require extensive instruction on teaching with high-fidelity model simulators</li> <li>• More faculty and staff time needed to prepare lessons</li> <li>• Requires regular maintenance and technical support</li> <li>• Increased space and storage requirements</li> <li>• Cannot replace real experiences</li> </ul> |

\* Rauen, 2004; Beyea 2006; Medley & Horne, 2005; and Seropian et al., 2004

Anecdotal evidence corroborates the literature regarding the limited usefulness of simulations. Danielle Calabrese, President of the Student Nurses Association of Pennsylvania (SNAP), asked SNAP Board members, "In what ways has simulation technology help to enhance nursing students' abilities during clinical rotations?" The Board stated that simulation technology is not as valuable as the hands-on, face-to-face experiences with patients, because simulation technology scenarios are not realistic. Calabrese further reported that "schools with simulation technology indicate they do not use it as often as they could, because not all faculty know how to use the technology, or there is not a full-time campus lab instructor to review skills using the technology" (Calabrese, 2006).

## Collaborative Use of Health Care Technology

The creation and use of centralized simulation centers is a pioneering initiative. As such, there is a lack of empirical evidence to ensure the use of collaborative simulation centers produce a significant increase in nursing school capacity. However, education providers are able to obtain pricing agreements that significantly lower equipment costs through collaboration. In addition, centralized, shared equipment prompts unified practices and resource accessibility. Education providers which have neither space nor funds for high-fidelity equipment can provide simulation experience to students through participation in shared simulation centers.

The few centralized simulation facilities that are either operational or in advanced planning stages possess different structures. The following sections describes four models – the partnership, independent business, mobile unit, and coordinated models.

### Partnership Model

The simplest and most common method of sharing simulation equipment among schools or hospitals is through a single shared facility. One school or hospital funds and builds a high-fidelity simulation center and invites neighboring schools and hospitals to participate (Minnesota State Colleges and Universities, 2004). Classes may be open to the public, or the center may reserve time for classes from other institutions. All partner institutions provide funding, with the largest portion coming from the host institution. Several of these models operate within large university systems.

Shared facilities allow access to schools that cannot house or fully fund high-fidelity simulation centers. Joint facilities are housed locally and visiting participants usually travel no more than 10-20 miles from their home institution. By collaborating, each participating school pays a smaller amount than if it had built its own facility. Additionally, the simulation equipment is likely to be in use a greater percentage of the day, lowering its cost per use.

The hosting university or hospital retains the right to solicit participation from other institutions and is under no obligation to invite every school or hospital in its immediate area. Since hosts control or contribute most of the funding, staff and students from that institution may receive more simulation time than students from other schools. The size of the facility usually is dependent on the availability of space, as new space is rarely constructed to house such centers.

Table 17: Advantages and Disadvantages of the Partnership Model

| Advantages  | Disadvantages   |
|---|---|
| <ul style="list-style-type: none"> <li>• Some access for all schools in the collaborative</li> <li>• Housed locally; minimal travel required</li> <li>• Cost per school is lessened</li> <li>• Equipment is used efficiently</li> </ul> | <ul style="list-style-type: none"> <li>• Not all schools in the region may be part of the collaborative</li> <li>• Host institution bears a high-level of responsibility</li> <li>• Host institution may have more than a proportionate amount of time</li> </ul> |

\* Metropolitan State Colleges and Universities, 2004; UPMC, 2006; and Burns, 2006

The Peter M. Winter Institute for Simulation, Education & Research (WISER) housed at the University of Pittsburgh is an excellent example of a partnership model. Partners include all 20 University of Pittsburgh Medical Center (UPMC) hospitals and all of the health science departments at the University of Pittsburgh.

WISER currently has 16 Laerdal human patient simulators, and 118 active course facilitators. In addition to the patient simulators, there are twelve simulation rooms and eight other rooms which students and instructors can use. To date, the center has trained over 9,000 students in more than 7,000 simulations and over 1,400 courses have used the WISER facilities (UPMC, 2006). Helen Burns, Associate Dean of Clinical Education at the University of Pittsburgh School of Nursing, claims that her nursing school uses the WISER facilities and incorporates simulation technology at every level (Burns, 2006). The prime user of the space is the School of Medicine.

Operating expenses for the center come from a variety of sources including the Asmund S. Laerdal Foundation for Acute Medicine, Fort Sam Houston, Anesthesia Patient Safety Foundation, University of Pittsburgh Schools of Medicine and Nursing, and UPMC Health Systems, in addition to the Institute's revenue streams (UPMC, 2006).

### Independent Business Model

Several universities and hospitals with simulation centers rent their facilities much like for-profit businesses. These centers charge users a competitive fee and occasionally offer different rates to academic and non-academic users. Space and equipment are scheduled according to user needs and ability to pay. One institution takes responsibility for owning and operating the facility and providing qualified instructors and facilitators for simulations and team experiences. All simulation centers operating in this model are nonprofit corporations (Harvard Center for Medical Simulation, 2006).

As scheduling is done on a first-come basis, it may be difficult for nursing education providers to schedule time in simulation facilities. The host institution has priority in scheduling simulation exercises. Time is paid for and planned, so students may not repeat and practice simulations in the labs. Their simulation experiences are dependent on the financial commitment their school makes. Institutions and students from outside the local area may use the center, draining available time and resources that could benefit local schools.

Table 18: Advantages and Disadvantages of the Independent Business Model

| Advantages  | Disadvantages  |
|---|--|
| <ul style="list-style-type: none"> <li>• Funding provided from user fees</li> <li>• Equally accessible to all who can afford it</li> <li>• High-fidelity equipment is obtained and upgraded as necessary</li> </ul> | <ul style="list-style-type: none"> <li>• Scheduling dependent on space availability</li> <li>• Host institution receives priority in scheduling</li> <li>• Does not provide students opportunities to “practice”</li> <li>• Users from outside the area may limit time available for regional users</li> </ul> |

\* Harvard Center for Medical Simulation, 2006

The Harvard Center for Medical Simulation (CMS) opened in 1993 as an independent business and is an example of an independent business model. CMS has a variety of programs including clinical education, the Institute for Medical Simulation, Healthcare Adventures for Leadership and Management teams, and customized services. Few semester-long courses are offered (Harvard Center for Medical Simulation, 2006). CMS also provides customized services including usability testing, simulation videoconferencing, consulting, speaking, and clinical facility photography and film settings.

More than 350 educational scenarios are administered through high-fidelity manikins in a simulated clinical space. CMS has 10 specialty areas including: anesthesia, emergency medicine, ICU, labor and delivery, otorhinolaryngology, pain service, radiology, EMS and transport teams, surgical teams, and code teams. Quarter- to full-day educational sessions can be administered in each area. These sessions cost between \$1,500 per team to \$5,500 per team per day.

The Institute for Medical Simulation offers “courses, in partnership with Harvard-MIT Health Sciences and Technology, for those who want to develop and maintain high-quality medical simulation programs within their organizations.” These courses last 5 ½ days, and participants are charged \$3,200 per person. The Institute also offers these courses on-site for \$9,000 per day with a maximum enrollment of 18 individuals.

The Healthcare Adventures program is designed for leadership teams across health professions. CMS trains participants to improve teamwork and collaboration skills. The sessions utilize simulation scenarios to bring to light communication issues within teams. Sessions last from 3 hours to a full day and cost between \$5,000 and \$12,000 per team.

CMS is incorporated as a nonprofit corporation and is funded primarily through user fees. Through its nonprofit educational status, the center negotiated malpractice insurance premium incentives for practitioners who engage in simulation experiences.

## Mobile Unit Model

Mobile simulation units are the size of a large bus or 18-wheel truck and contain a simulated clinical environment. The unit reaches a target location and trains professionals on one specific skill or procedure through the use of high-fidelity simulation. Mobile simulation units are relatively new. Therefore, not much information on their programming is available.

With a traveling simulation unit, time is not monopolized by a host institution. Rather, time is allocated according to a schedule and the length of the unit's stay. A mobile unit can travel virtually anywhere, giving it the ability to provide access to rural and remote institutions as well as institutions facing cost constraints. There is limited financial burden placed on the institution the unit visits. With a mobile unit, professionals receive orientation to new equipment rapidly.

A mobile unit is subject to traveling conditions such as weather, distance, and road conditions. Simulations may not adequately and realistically simulate a clinical environment due to size limitations. Mobile units may only provide in-depth education on one particular piece of equipment or procedure. There is little practice time available to students outside of the initial simulation time. Students may not access the simulation equipment for further practice and may not have the advantage of performance recording and debriefing.

Table 19: Advantages and Disadvantages of the Mobile Unit Model

| Advantages   | Disadvantages  |
|--|--|
| <ul style="list-style-type: none"> <li>• Time not monopolized by host institution</li> <li>• Can travel to remote locations</li> <li>• Can be used at low cost to host institution</li> <li>• Can receive orientation to new equipment faster</li> </ul> | <ul style="list-style-type: none"> <li>• Subject to travel conditions</li> <li>• Limited in size</li> <li>• May not simulate a full clinical environment</li> <li>• May only provide education on one procedure/piece of equipment</li> <li>• Does not provide practice time for students</li> <li>• May not have performance recording or debriefing</li> </ul> |

\*Shute, 2006

Dr. Paul Preston of California's Kaiser Hospital developed what may have been the first mobile simulation unit in 2001 with help from Dr. David Gaba, founder of Stanford University's simulation center (Shute, 2006). Dr. Preston's model incorporates many of the standard simulation center procedures, including performance recording and debriefing. His operation, through the help of Kaiser Hospital, is expanding into cardiac catheterization labs and medical-surgical wards. Ascension Health is launching a prenatal safety program based on Preston's model (Shute, 2006).

## Coordinated Model

The coordinated model is the most complex simulation collaborative model, as it is characteristically formed on a high-level and includes many participants and

stakeholders. The model is identified by a central body which acts as a promoter and organizer of simulation experiences throughout an identified region. This central organization may create or support more localized collaborative efforts. They work to secure resources for institutions interested in simulation.

The main advantage of the coordinated model is the ability of the central organization to be a clearinghouse of simulation knowledge and resources for health care institutions. The coordinated body can negotiate better pricing on equipment and standardize teaching methods and criteria. It can ensure equal access throughout the identified region. Simulation facilities operate independently of the coordinated body's policies and procedures.

A key disadvantage of the coordinated model is that operation of such organizations may become bureaucratic. If located regionally, students may have less access as a result of a further commute to the facility. Students also may not have as much access because they must commute to the facility rather than visiting it at their home institution.

Table 20: Advantages and Disadvantages of the Coordinated Model

| Advantages  | Disadvantages   |
|---|---|
| <ul style="list-style-type: none"> <li>• Clearinghouse for simulation information</li> <li>• Can negotiate better equipment pricing</li> <li>• Can standardize teaching methods</li> <li>• Can ensure equal access to participating institutions</li> <li>• Facilities operated by coordinating body can operate independently</li> </ul> | <ul style="list-style-type: none"> <li>• May be bureaucratic in operation</li> <li>• Less access as a result of distance</li> <li>• Less access than facilities located within home institutions</li> </ul> |

\* Seropian, 2005; and Oregon Governor's Workforce Initiative, 2005

The Oregon Simulation Alliance (OSA) could be considered a coordinated model. The Oregon Governor's Healthcare Workforce Initiative created the OSA in November 2003 (Seropian, 2005). The mission of OSA is "to provide leadership in the use of simulation technologies to increase the quality and quantity of Oregon's healthcare workforce" (Oregon Governor's Workforce Initiative, 2005). The OSA is a network of healthcare stakeholders including health systems, public/private universities, allied health, nursing, community colleges, public health, and the governor's office. The alliance increases success, eases implementation, and improves cost efficiency of integrating simulation technology into healthcare education (Seropian, 2005).

The organization allowed natural collaborations to form instead of regional centers. The alliance awarded \$1 million for simulation equipment and faculty development through state and federal funding (Seropian, 2005). Grant applicants are asked to show evidence of collaboration, willingness to participate in the statewide alliance, and ability to abide by the alliance's principles, which include: local control, quality outcomes, standardized data, innovation, change, collaboration, multi-sector participation, and sustainability (Oregon Governor's Workforce Initiative, 2005). The grants have created more than 12 simulation facilities in Oregon and serve more than 40 institutions (Seropian, 2005).

## Videoconferencing

Videoconferencing often is used in collaboration with simulation technology. It enables long-distance, live interactions between individuals and groups. This particular technology is useful for bringing simulations to educational institutions that cannot purchase expensive equipment (Levinson, 2002). It also allows for the sharing of expertise among individuals in different geographic locations.

Videoconferencing enables students and practitioners in rural communities to have access to simulations. Likewise, it provides the opportunity to interact with experts around the world. Another advantage to videoconferencing is that it allows health care workers to practice critical event management and test alternative hypothesis (Cooper, Barron, Blum, Davison, Feinstein, Halasz, Raemer, and Russell, 2000).

However, videoconferencing equipment is expensive and constantly changing. In addition to purchasing video equipment, screens, and projectors, schools must have high-bandwidth transmission lines (Cooper et al, 2000). Videoconferencing may not be an effective learning tool for all students. Some students prefer traditional classroom and clinical teaching methods. Furthermore, videoconferencing does not allow hands-on practice in providing patient care.

Table 21: Advantages and Disadvantages of Videoconferencing

| Advantages   | Disadvantages  |
|--|--|
| <ul style="list-style-type: none"> <li>• Provides greater access to educational opportunities, particularly for students in rural areas</li> <li>• Enables interaction with experts from around the world</li> <li>• Allows health care workers to practice critical event management and test alternative hypothesis</li> </ul> | <ul style="list-style-type: none"> <li>• Equipment and infrastructure is expensive and constantly changing</li> <li>• Some students prefer traditional classroom teaching methods and may not perform well through videoconferencing</li> <li>• Does not allow for kinetic learning</li> </ul> |

\* Levinson, 2002 and Cooper et al, 2000

Mount Aloysius College in Cresson, Pennsylvania, is utilizing videoconferencing tools as part of its Nursing Telehealth Applications Initiative (NTAI). This program is funded through the Office of Naval Research and the Henry M. Jackson Foundation for the Advancement of Military Medicine. NTAI is establishing a Virtual Clinical Practicum to enable nursing students located at Mount Aloysius to engage in collaborative distance-learning efforts with a military treatment facility (Grady and Berkebile, 2004).

MedSmart, a U.S. non-profit dedicated to providing simulation experiences to medical personnel, developed Robo-Patient. Robo-Patient utilizes videoconferencing to bring simulations rural and remote communities. Robo-Patient operates by integrating advanced, remotely controlled patient simulators into an interactive 3-D video-teleconferencing/telepointing, Internet-based network (MedSMART, 2006). It provides education in human disease, trauma, triage, management of mass casualties, counteraction of biological and chemical terrorism, and communication. The cost of Robo-Patient varies based on location and setup but is less than the Laerdal or METI human patient simulators.

## Distance and Web-Based Learning

For the purposes of this report, distance learning is defined as “a set of teaching and/or learning strategies to meet the needs of students who are separate from the traditional classroom setting.” According to the AACN in *Distance Technology in Nursing Education: Assessing a New Frontier* (2000), distance learning utilizes a variety of health care technologies, including audio or video conferences, videotaped instruction, courier service, e-mail, faxing, Internet list-servs, and Internet-based programs (AACN, 2000).

Web-based learning is one of the most popular distance learning methods. This educational experience is delivered over the Internet or an organization’s intranet. There are two primary models of web-based learning: synchronous (instructor-facilitated) and asynchronous (self-directed, self-paced). Web-based learning utilizes static methods such as hyperlinked pages, streaming audio/video, and live web broadcasts. It also utilizes interactive methods such as chat rooms and message boards (SearchWebServices, 2000).

Distance learning has many benefits. For example, students in rural areas have greater access to educational opportunities, and those individuals pursuing education part-time can complete assignments at their own pace at any time of the day. Additionally, distance education may be more attractive to younger generations of nursing students. The Millennials (those individuals born after 1980) thrive in interactive educational environments (Raines, 2002). They are technology-savvy students who often prefer instant communication via the Internet (Neuman, 2006).

This educational delivery method also helps to decrease the impact of the nursing shortage, because faculty members are able to instruct more students at one time. Likewise, faculty can save time through electronic communications with preceptors in clinical settings (Neuman, 2006). This decreases the number of clinical site visits faculty must make. Faculty also can conduct student evaluations and conferences via phone or Internet.

Since the cost of distance learning technology is decreasing, existing equipment and infrastructures are becoming obsolete. This poses a serious problem for some schools to continuously purchase and effectively implement technology. *Expand the Reach of the Nurse Education Act with New Initiatives: AACN Recommendations to Address the Nursing Shortage* (2001) states that distance education is increasing competition for an already short supply of nursing students and faculty members (AACN, 2001). Nursing schools are no longer competing within small geographic regions for talent – they are competing on a national and even global scale.

Nursing students and faculty members also should consider that distance education is not for everyone. Some individuals learn best in traditional classrooms and clinical settings, while others excel in technology-based learning environments. Distance learning does not allow for practice of physical acuity. Interacting with a computer does not have the same tactile feel as practicing a skill on a live patient or a manikin.

Table 22: Advantages and Disadvantages of Distance and Web-based Learning

| Advantages  | Disadvantages  |
|---|--|
| <ul style="list-style-type: none"> <li>• Provides greater access to educational opportunities, particularly for students in rural areas</li> <li>• Fosters flexibility, because students can complete assignments at their own pace at any time of day</li> <li>• Attracts younger students who are interested in interactive learning experiences</li> </ul> | <ul style="list-style-type: none"> <li>• Equipment and infrastructure is expensive and constantly changing</li> <li>• Creates more competition for faculty and students</li> <li>• Some students prefer traditional classroom teaching methods and may not perform well through technology-based learning</li> <li>• Does not allow for physical acuity to be practiced</li> </ul> |

\* Raines, 2002; Neuman, 2006; AACN, 2001; Baldwin, Walker, & Evans, 2004; and Frankola, 2001

The Clinical Education Task Force identified the need to increase the number of clinical faculty, maximize the availability and use of clinical sites, and integrate relevant health care technologies into the nursing curriculum as the three priorities the Commonwealth should consider regarding nursing clinical education. It further put forth six recommendations in this report to increase Pennsylvania's nursing clinical education capacity and ultimately the supply of nurses in the Commonwealth. These recommendations are intended to compliment and build upon the prior work of the Pennsylvania Center for Health Careers, Pennsylvania Higher Education Assistance Agency, and Pennsylvania Higher Education Foundation.

# Appendix A: Nursing Education Options

The Commonwealth of Pennsylvania's nursing shortage has prompted educational institutions to accommodate students at various stages of life. These students may be recent high school graduates, second-degree seekers, individuals changing careers, or nurses pursuing career advancement opportunities. Educational institutions offer a variety of pathways to entry-level and advanced nursing careers.

Choices regarding nursing programs should reflect individual career aspirations and employer needs. Some nurses will be limited to part-time, entry-level employment because of family responsibilities or personal lifestyles, while others may want to become senior administrators. Employers understand that nurses have different needs, and some institutions provide a career mentor who discusses personal preferences and career goals with each nurse. Educational choices also must be made with employer demand in mind. Some regions may need highly specialized nurses with advanced education, while others may need LPNs to provide basic nursing care.

This appendix provides an overview of the nursing education programs available in the Commonwealth and possible pathways to various nursing careers. Topics discussed for each program include prerequisites, typical length, program focus, and career options.

## Licensed Practical Nurse (LPN) Programs

Licensed Practical Nurse (LPN) programs prepare students to care for the sick, convalescent, and disabled under the direction of physicians and registered nurses (RNs). A high school diploma or GED is required for admission. LPN programs are offered at career centers and community colleges. These programs normally take one year to complete, and students must pass the National Council Licensure Exam – Practical Nursing (NCLEX-PN). An LPN may assist with activities of daily living, administer medications via various routes including IV therapy, and obtain data such as temperatures, blood pressure, and blood sugar levels. LPNs evaluate resident and patient needs, contribute to their plan of care, and supervise the care provided by nursing assistants. LPNs working in doctors' offices also may make appointments, keep records, and perform other clerical duties. LPNs who work in private homes may prepare meals and teach family members simple nursing tasks (Pennsylvania Workforce Investment Board, 2006a).

## Registered Nursing Programs – All

There are several different methods of becoming a licensed registered nurse (RN). Educational programs preparing RNs include diploma, associate's, and baccalaureate degree programs. Each of these programs is described in detail below. RNs observe patients, record information, assist physicians, administer medications, and help patients with rehabilitation. RNs work in a variety of settings, including hospitals, doctors' offices, nursing homes, home health, public health, and occupational/industrial health (Pennsylvania Workforce Investment Board, 2006b).

## **Registered Nurse – Diploma Programs**

Diploma programs provide education in a hospital setting and prepare students to become entry-level RNs engaged in direct patient care. A high school diploma or GED is required for admission. Programs vary in length but normally last two to three years (PSNA, 2006). Some diploma programs are affiliated with community colleges, enabling students to take courses toward an associate's degree. Although some students enter diploma programs directly out of high school, a higher percentage of students are second-career students (K. Yecko, personal communication, October 5, 2006). Students must pass the NCLEX-RN exam to be licensed in the Commonwealth (PSNA, 2006).

## **Registered Nurse – Associate's Degree Programs**

Associate's degree programs usually are two-year programs provided by community colleges. They prepare students for entry-level work in direct patient care. RNs prepared by associate's degree programs are different from RNs prepared by diploma programs, because associate's degree students complete some general education requirements. This may include courses in English, mathematics, social sciences, and natural science (PSNA, 2006). Students must pass the NCLEX-RN exam to be licensed in the Commonwealth.

## **Registered Nurse – Bachelor of Science in Nursing (BSN) Programs**

The Bachelor of Science in Nursing (BSN) is the preferred degree for entry-level nurses and gives the student the best advancement opportunities. The AACN states that the BSN is necessary for developing case management and supervisory skills, while the National Advisory Council on Nurse Education and Practice states that BSN programs provide better education in settings outside of hospitals (AACN, 2004). BSNs usually are required for military nursing, public health nursing, overseas/development nursing, forensic nursing, and school nursing. Some countries like Australia and New Zealand require a BSN before taking the RN exam (Discover Nursing, 2005).

Students with varying education and experience can select from several BSN programs. Students entering higher education and nursing for the first time usually enter a prelicensure BSN program. Students previously licensed as an LPN or RN are accommodated through bridge programs that provide advanced placement credit for prior education and experience. Accelerated programs also are available for students who have a bachelor's degree in another field. Each of these programs is discussed in detail below.

### *Prelicensure Bachelor of Science in Nursing (BSN)*

A prelicensure BSN program is a four-year program designed for students without previous nursing education or experience. Students matriculating must have a high school diploma or GED. The first one to two years are spent fulfilling general education requirements, while the last two years are focused on nursing (PSNA, 2006). Graduates of prelicensure BSN programs are prepared for entry-level positions as staff nurses following successful completion of the NCLEX-RN exam.

### *BSN Completion Programs (LPN-to-BSN and RN-to-BSN)*

BSN completion programs are designed to give students who are licensed LPNs and RNs better career advancement opportunities. Students are given credit for previous coursework and experience in nursing and may be able to complete a bachelor's degree in two years. BSN completion programs often accommodate working students through courses offered on nights and weekends (PSNA, 2006). Approximately 30 percent of nurses nationwide come from RN-to-BSN programs (All Nursing Schools, 2006).

#### *Accelerated BSN (Second-Degree or Post-Baccalaureate BSN)*

Accelerated programs in nursing are available for students who previously completed a bachelor's degree in another field. These programs give students credit for prior completion of general education requirements and enable students to complete a BSN in two years or less (PSNA, 2006). Graduates are prepared for entry-level positions as staff nurses following successful completion of the NCLEX-RN exam.

#### **Master of Science in Nursing (MSN) Programs**

Master of Science in Nursing (MSN) programs prepare students for more independent roles in advanced practice nursing. MSNs hold titles such as nurse practitioner, clinical nurse specialist, nurse-midwife, nurse anesthetist, nurse psychotherapist, or nurse faculty member (PSNA, 2006). Some master's degree candidates pursue joint degrees in business administration, public health, or hospital administration (All Nursing Schools, 2006). Joint degrees help MSNs enter administrative positions in health care organizations and related industries such as insurance and medical technology (Joint Commission on the Accreditation of Healthcare Organizations, 2002).

Advanced practice nurses are in high demand, especially given they can deliver services typically provided by physicians at a lower cost.<sup>5</sup> The following nursing programs provide master's-level education: RN-to-MSN, accelerated MSN, MSN with an education specialization, post-certificate MSN, post-master's certificate.

#### *RN-to-MSN*

RN-to-MSN programs are the most traditional route to earning a master's degree in nursing. Students must have a BSN to enter the program, and they usually complete the MSN in two years (PSNA, 2006).

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<sup>5</sup> For example, a study conducted by the congressional Office of Technology Assessment found that nurse practitioners can deliver 80 percent of health services and 90 percent of pediatric care normally provided by primary care physicians. Nurse practitioners scored as well or better than physicians regarding communication with patients, preventive actions, and reductions in the number of patient symptoms (AACN, 2004).

### *Accelerated MSN*

Accelerated MSN candidates hold a bachelor's and/or master's degree in another field. These programs may be referred to as Direct-Entry, Graduate Entry, or Master's Entry programs. Students in this type of program must take prerequisite undergraduate courses in nursing and become a licensed RN before entering master's-level coursework (All Nursing Schools, 2006). Accelerated MSNs can be completed in two to three years. Students with master's degrees in other fields such as education are sought for their complimentary skills and experience.

### *MSN with an Education Specialization*

MSNs can choose to specialize in nursing education. These students complete courses in teaching, learning, and evaluation theories in addition to traditional graduate-level nursing courses. Nurse educators can focus in clinical education, teaching theory, or research. Most nurse faculty members in the Commonwealth have an MSN, although professional associations encourage nurse faculty members to obtain doctoral degrees (AACN, 2003).

### *Post-Certificate MSN*

RNs historically could be certified as a nurse anesthetist, nurse practitioner, or nurse-midwife. Most states now require a master's degree prior to certification in these specialties. Many RNs are practicing in these specialty areas but must complete a master's degree to continue practicing. Post-certificate MSN programs help these students to quickly complete a master's degree by giving them credit for previous educational and work experience. These programs typically take two years or less to complete (All Nursing Schools, 2006).

### *Post-Master's Certificate*

Post-master's certificates provide MSNs the opportunity to further develop a specialization in more than 30 nursing areas such as mental health, pediatrics, gerontology, and community health. Certificate programs usually can be completed in one year. Certification exams are provided by the American Nurses Credentialing Center, which is part of the American Nurses Association.

## **Doctoral Programs**

Doctoral degrees typically take three to six years to complete and can take a variety of forms (PSNA, 2006). Students usually are required to hold a MSN prior to matriculation. Each doctoral program helps students to enter a particular specialty in clinical practice, administration, or academia.

### *Doctor of Nursing Programs (ND)*

The Doctor of Nursing Programs prepares students to initiate change through system redesign and evidence-based decision-making. The program takes three to five years to complete, including summers (All Nursing Schools, 2006).

### *Doctor of Nursing Practice (DNP)*

Doctor of Nursing Practice programs are new to the field and emphasize clinical practice. Students learn how to make decisions that account for quality of care, access, and fiscal responsibility. DNPs are prepared for leadership positions in research, patient outcomes, and system management (All Nursing Schools, 2006).

### *Doctor of Nursing Science (DNS)*

Doctor of Nursing Science programs prepare students to conduct research and influence health care organizations through clinical leadership skills. DNSs are involved in health outcomes measurement, health care economics, statistical analysis, and informatics (All Nursing Schools, 2006).

### *Doctor of Education (EdD)*

Doctor of Education programs in nursing prepare students to teach in higher education environments. Courses are focused on research methods, nursing theory, educational theory, and curriculum design (Columbia University Teachers College, 2000).

### *Doctor of Philosophy (PhD)*

Doctor of Philosophy programs are focused on conducting scholarly research that advances the theoretical foundations of nursing practice and health care delivery. PhDs are preferred for executive-level nursing positions in health care organizations and may also work in public policy organizations (All Nursing Schools, 2006).

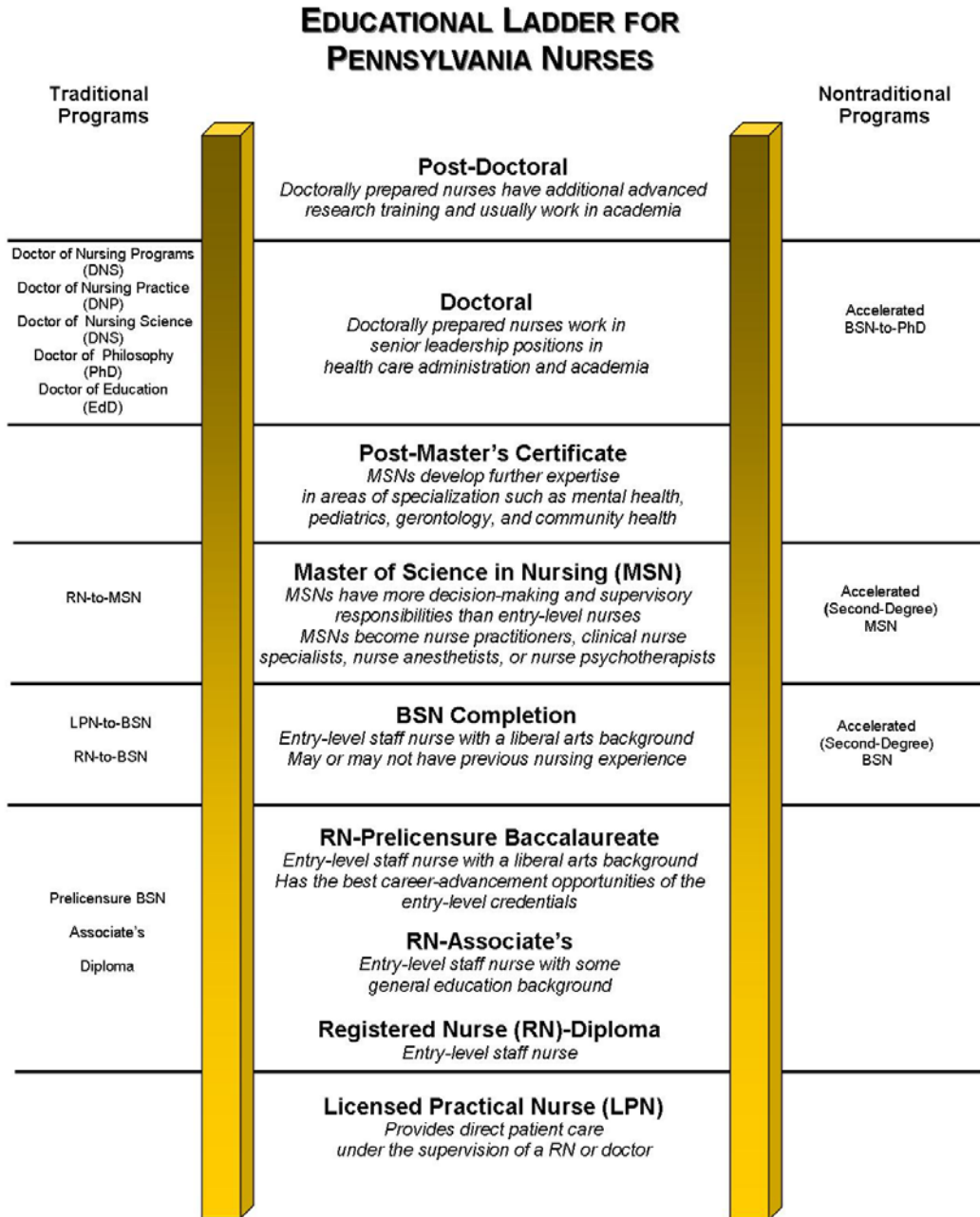
### *Accelerated BSN-to-PhD*

The Accelerated BSN-to-PhD is a relatively rare program for entry-level students who are definitely planning to become researchers or faculty members. The program provides students a faster way to complete a BSN, MSN, and PhD (All Nursing Schools, 2006).

### *Post-Doctoral Programs*

Post-doctoral programs provide one to three years of advanced research experiences to doctorally prepared nurses working in academia and research settings (All Nursing Schools, 2006).

# Appendix B: Nursing Career Ladder



\* AACN, 2004; All Nursing Schools, 2006; Discover Nursing, 2005; Pennsylvania Workforce Investment Board, 2006a, 2006b; and PSNA, 2006

# Appendix C: Master's Programs with Nurse Education Concentrations

## State System Schools

N = 4

| University                     | Location  | School's Website  |
|--------------------------------|-----------|---|
| Clarion University of PA       | Northwest | <a href="http://www.clarion.edu/academic/nursing/school_info.shtml">www.clarion.edu/academic/nursing/school_info.shtml</a>              |
| Edinboro University of PA      | Northwest | <a href="http://webs.edinboro.edu/departments/nursing.asp">http://webs.edinboro.edu/departments/nursing.asp</a>                         |
| Indiana University of PA       | Southwest | <a href="http://www.iup.edu/rn-alliedhealth.edu">www.iup.edu/rn-alliedhealth.edu</a>  |
| Millersville University of PA  | Central   | <a href="http://muweb.millersville.edu/~nursing/nursing_education.php">http://muweb.millersville.edu/~nursing/nursing_education.php</a> |
| Slippery Rock University of PA | Southwest | <a href="http://www.sru.edu/pages/3831.asp">www.sru.edu/pages/3831.asp</a>  |

## Private Schools

N = 12

| College or University      | Location  | School's Website   |
|----------------------------|-----------|--|
| DeSales University         | Southeast | <a href="http://www.desales.edu/default.aspx?pageid=809">www.desales.edu/default.aspx?pageid=809</a>   |
| Drexel University          | Southeast | <a href="http://www.drexel.edu/cnhp/nursing/grad_msn_education.asp">www.drexel.edu/cnhp/nursing/grad_msn_education.asp</a>   |
| Duquesne University        | Southwest | <a href="http://www.nursing.duq.edu/gradMsnEdu.html">www.nursing.duq.edu/gradMsnEdu.html</a>   |
| Immaculata University      | Southeast | <a href="http://www.immaculata.edu/Academics/Departments/nursing/msn_nursingEd.htm">www.immaculata.edu/Academics/Departments/nursing/msn_nursingEd.htm</a>   |
| La Salle University        | Southeast | <a href="http://www.lasalle.edu/admiss/grad/msn/certificate_education.php">www.lasalle.edu/admiss/grad/msn/certificate_education.php</a>   |
| Neumann College            | Southeast | <a href="http://www.neumann.edu/academics/grad/nursing/index.asp">www.neumann.edu/academics/grad/nursing/index.asp</a>   |
| Robert Morris University   | Southwest | <a href="http://www.rmu.edu/OnTheMove/findoutmore.open_page?iCalledBy=findoutmore&amp;iPage=61131&amp;iT=&amp;iattr=&amp;ivisor=0&amp;ichap=left_nursing">www.rmu.edu/OnTheMove/findoutmore.open_page?iCalledBy=findoutmore&amp;iPage=61131&amp;iT=&amp;iattr=&amp;ivisor=0&amp;ichap=left_nursing</a> |
| University of Pennsylvania | Southeast | <a href="http://www.nursing.upenn.edu/academic_programs/grad/masters/">www.nursing.upenn.edu/academic_programs/grad/masters/</a>   |
| University of Pittsburgh   | Southwest | <a href="http://www.pitt.edu/~nureduc/curriculum/minor.html">www.pitt.edu/~nureduc/curriculum/minor.html</a>   |
| Villanova University       | Southeast | <a href="http://www.villanova.edu/nursing/programs/graduate/masters/concentrations/education/index.htm">www.villanova.edu/nursing/programs/graduate/masters/concentrations/education/index.htm</a>   |
| Waynesburg College         | Southwest | <a href="http://www.waynesburg.edu/gradprof/documents/PostGradnursing_final_8-1.pdf">www.waynesburg.edu/gradprof/documents/PostGradnursing_final_8-1.pdf</a>   |
| Widener University         | Southeast | <a href="http://www.widener.edu/Academics/Schools_amp_Colleges/School_of_Nursing_/Graduate/Master_s_Program/1740/?">www.widener.edu/Academics/Schools_amp_Colleges/School_of_Nursing_/Graduate/Master_s_Program/1740/?</a>   |

## Nurse Educator Concentrations by Region

N = 16

| Region         | Southeast | Southwest | Northwest | South Central |
|----------------|-----------|-----------|-----------|---------------|
| No. of Schools | 8         | 6         | 2         | 1             |

This information reflects all Nurse Educator concentrations in Pennsylvania Nursing Schools featured on [www.allnursingschools.com](http://www.allnursingschools.com).





# Appendix E: Nurse Competency Model

The Arizona State Board of Nursing uses the following competency model to describe behaviors nurses should demonstrate at various levels of education.

## ARIZONA STATE BOARD OF NURSING COMPETENCY MODEL

### INTRODUCTION

#### **Background**

The mission of the Arizona State Board of Nursing is to protect the public health, safety and welfare through the safe and competent practice of nurses and nursing assistants. The Board relies on Advisory Committees composed of practicing nurses to guide them on matters relating to scope of practice, chemical dependency, education, law and rules, and nursing assistants.

The Education Advisory Committee is the entity that advises the Board on matters relating to education. The committee is composed of educators and nurses from a variety of programs and geographic regions. In 2003, the Education Advisory Committee became aware of confusion among nurses and the public regarding the competencies of nurses at differing educational levels. The multiple pathways to RN licensure at either an associate, baccalaureate, or in some cases diploma levels add to the confusion of the public, nurses, and prospective nursing students. Additionally, confusion exists regarding the competencies of a nurse with a master's degree in nursing as compared to a nurse with a master's degree in another field.

This document was developed to clarify nursing roles for the public, nurses, and prospective nursing students regarding nursing ability and function at the differing levels of nursing education. The document will also provide a framework for the Board to further develop scope of practice rules and advisory opinions.

To facilitate the work of the committee a subcommittee was formed to develop a draft document. The mission of the subcommittee was to develop a document that:

- Delineates competencies for levels of nursing education from nursing assistant through doctoral level
- Focuses on outcomes and builds on previous competencies
- Is easily accessible to the public
- Is consistent with recognized models of nursing education
- Decreases confusion on the part of nurses, prospective nursing students and the public
- Is consistent with the administrative rules and statutes of the Arizona State Board of Nursing
- Demonstrates the inherent worth and value of all educational levels of nursing

The subcommittee reviewed the language and structure of competency models developed by the Kentucky Nursing Education Mobility Task Force (2001), the Oklahoma Board of Nursing, and other related publications to guide the development of this model (see references). The subcommittee adapted the framework developed by the Kentucky Nursing Education Mobility Task Force to delineate nursing practice and education in Arizona.

#### **Levels of Education**

The Arizona State Board of Nursing regulates certified nursing assistants, licensed practical nurses, registered nurses, and advanced practice nurses. The Board also has jurisdiction over nursing assistant programs, pre-licensure nursing programs, and advanced practice nursing programs. Six levels of education are addressed in the competency model. Since there are no

## Arizona Nurse Competency Model (continued)

diploma-nursing programs in Arizona, this level of education was not addressed. The subcommittee recognized the importance of including the doctoral level in order to inform the public of expectations of nursing care at that level. The levels of education and descriptions of these levels in Arizona are:

- Nursing Assistant: A nursing assistant has a minimum of 120 hours of education focused on meeting basic needs of long-term care residents.
- Licensed Practical Nurse: A licensed practical nurse generally completes a vocationally oriented program of 6 to 12 months in length at a community college, skill center, or private vocational college.
- Associate Degree RN: An associate degree RN completes a two-year nursing program at a community or private college. The program may be preceded by 2-3 semesters of prerequisite courses.
- Bachelors of Science Degree RN: A bachelor of science in nursing RN completes a 4-year degree at a university. The first 3-4 semesters of the program consist of prerequisites and general education courses.
- Master of Science in Nursing: A master of science in nursing degree consists of 3-5 semesters of full time study including a research thesis or project. There are several tracks available to students such as advanced practice, teaching, or administration.
- Doctoral Level (Ph.D, DNSc): A doctoral degree in nursing involves a minimum of 4 semesters of additional study and the completion of an extensive original research project (dissertation).

### **Conceptual Framework**

The model describes attributes of nurses and nursing assistants from the CNA level through the doctoral level based on educational preparation. The framework is organized into three roles of nursing:

- Provider of care: “the nurse uses a systematic process and appropriate resources to assist clients in meeting health needs in an evolving health system.” (Kentucky, 2001, p. 13)
- Manager of care: “the nurse assures that the right care is given at the right time, in the right setting, and at the right cost to achieve desired outcomes,” (Kentucky, 2001 p.14) and
- Member of the profession: “the nurse is accountable for a practice reflecting the legal and professional standards governing nursing” (Kentucky, 2001, p. 15).

Within each role, nursing functions include: caregiver, communicator, coordinator/collaborator, advocate, and teacher/counselor (Kentucky, 2001). These concepts are defined as follows:

- Caregiver: Provides care according to a nursing plan that promotes and maintains optimal health status.
- Communicator: Engages in a complex, ongoing, interactive process, which leads to therapeutic and effective relationships with patients and others.
- Coordinator/Collaborator: Manages resources and interacts with others to achieve optimal client outcomes.
- Advocate: Directs actions so that client welfare prevails.
- Teacher/Counselor: Facilitates knowledge acquisition to effect behavioral changes that promote optimal health status.
- Scholar: Continually seeks and utilizes information to promote scientifically based nursing practice.

## Arizona Nurse Competency Model (continued)

### Uses

The competency model described in this document will serve to guide nurses, prospective nursing students, and the public in distinguishing the functions and abilities of nurses and nursing assistants by educational level. The model demonstrates that all levels of nursing practice/education contribute to the overall health and well being of individuals, families, and groups within the context of safe competent nursing care. This model is not intended to define the legal scope of practice for any level of nursing. As nursing practice evolves, the model will be updated to encompass the increasing complexity of nursing knowledge and changes in health care delivery systems.

*Introduction by Pamela K. Randolph RN, MS, CPNP*

### Subcommittee Members:

Subcommittee members include:

- Joyceen Boyle RN, Ph.D., Associate Dean University of Arizona;
- Teri Britt, RN, Ph.D, Mayo Hospital;
- Linda Riesdorff RN, MS, Director, Mohave Community College Nursing Program;
- Margie Schultz, RN, Ph.D., GateWay Community College Practical Nurse Educator,
- Noel Smith, RN, BSN, Scottsdale Community College Nurse Assistant Educator, and
- Pamela Randolph RN, MS, CPNP, Arizona State Board of Nursing Education Consultant.

### References:

American Nurses Association (1997). *Position statement: Education for participation in nursing research*. Retrieved December 31, 2003 from [www.nursingworld.org/readroom/position/research/rseducat.htm](http://www.nursingworld.org/readroom/position/research/rseducat.htm).

State of Arizona (2003). *Nurse Practice Act*. Retrieved on December 31, 2003 from <http://www.azboardofnursing.org>.

Kentucky Nursing Education Mobility Task Force (2000). *Nursing Education in Kentucky*. Louisville, KY: Kentucky Mobility Task Force.

Nurse Utilization Task Force (2001). *Goals for Nursing Practice and Education in Oklahoma*. Retrieved December 31, 2003 from <http://www.youoklahoma.com/nursing/ed-goals.htm>.

Arizona Nurse Competency Model (continued)

| COMPETENCY MODEL                 |  |  |  |   |   |   |
|----------------------------------|--|--|--|---|---|---|
| MANAGER OF CARE                  |  |  |  |   |   |   |
| INTEGRATED CONCEPTS              | NURSING ASSISTANT  | LICENSED PRACTICAL NURSE   | ASSOCIATE DEGREE   | BACHELORS DEGREE IN NURSING   | MASTERS DEGREE IN NURSING   | DOCTORAL LEVEL  |
| <b>Caregiver</b>                 | Under the direction of the licensed nurse, follows directions according to the established plan of care. | Under the direction of the registered nurse, uses an established plan of care to meet basic health needs.                  | Develops and implements a plan of care using theory and evaluates patient outcomes.  | Develops and implements a plan of care and evaluates patient outcomes using theory, evidence based practice and interdisciplinary resources.  | Applies specialized knowledge and expertise to design, coordinate, implement, and evaluate comprehensive, integrated care.                            | Designs and evaluates systems of care.  |
| <b>Communicator</b>              | Reports and records data using appropriate health care terminology and demonstrates caring behavior.     | Establishes and participates in therapeutic relationships.   | Uses goal-directed therapeutic communication techniques effectively with individuals and families.   | Uses goal directed therapeutic communication effectively with individuals, families, communities and special populations.   | Implements complex communication strategies with individuals, families, communities and special populations.  | Provides creative leadership to address political, social, and ethical issues in health care.   |
| <b>Coordinator/ Collaborator</b> | Completes assignments in an organized manner while contributing to team functioning.                     | Organizes and manages care for assigned clients while working with families and health team members.                       | Works with the patient and health team members to establish priorities and manage care to achieve desired patient outcomes.  | Facilitates interdisciplinary services to ensure desired outcomes in individual, families, communities, and special populations.  | Establishes and evaluates professional networks for the purpose of improving outcomes for individuals, families, communities and special populations. | Collaborates with individuals, families, communities, special populations, health systems to communicate research and theoretical concepts that improve outcomes. |
| <b>Advocate</b>                  | Recognizes situations that may impact patient/family well being.   | Identifies and actively addresses issues related to protection of patients.  | Uses knowledge of consumer rights and responsibilities to plan care and intervene on behalf of patients. Is aware of health policy and its impact on patient care. | Uses problem solving strategies in support of patient rights and facilitates policy changes. Disseminates information about health policy and consumer rights and responsibilities. | Analyses data and engages in health policy development and evaluation at the institutional and community level.                                       | Synthesizes knowledge in nursing and related fields to improve health care policies at the institutional, state, regional, national and global level.             |
| <b>Teacher/ Counselor</b>        | Reports client knowledge needs and provides basic instruction as directed.                               | Implements health teaching for clients with identified health needs using established teaching plans.                      | Develops implements, and evaluates teaching plans for individuals and families.  | Uses interdisciplinary resources to develop, implement and evaluate comprehensive teaching plans to meet the learning needs of individuals, groups and communities.                 | Uses advanced theoretical knowledge to design, coordinate, and evaluate comprehensive teaching programs for individuals, populations and systems.     | Uses concepts, theories, and strategies from nursing and related disciplines to promote excellence in contemporary nursing education and clinical practice.       |
| <b>Scholar</b>                   | Achieves and maintains knowledge and skills necessary to provide safe patient care.                      | Participates in formal and informal education necessary to perform nursing care consistent with the LPN scope of practice. | Participates in the implementation of evidence-based programs/practice.  | Critically appraises and uses research findings to implement evidence based practice.   | Commits to the development and dissemination of knowledge for the purpose of improving nursing care.  | Independently conducts and communicates research that advances nursing knowledge and scholarship to improve nursing care.   |

| COMPETENCY MODEL                 |   |  |   |  |   |   |
|----------------------------------|---|--|---|--|---|---|
| PROVIDER OF CARE                 |   |  |   |  |   |   |
| INTEGRATED CONCEPTS              | NURSING ASSISTANT   | LICENSED PRACTICAL NURSE   | ASSOCIATE DEGREE  | BACHELORS DEGREE IN NURSING  | MASTERS DEGREE IN NURSING   | DOCTORAL LEVEL  |
| <b>Caregiver</b>                 | Organizes care for assigned clients   | Prioritizes care for own clients and delegates to unlicensed assistive personnel.  | Manages client care delivery and delegates/ assigns care to peers, LPN's and unlicensed assistive personnel. Coordinates human and material resources for clients and families. | Assumes an influential role in planning, organizing, and monitoring the effective use of resources within the health care setting. | Analyzes and influences system level strategies to optimize resources and promote positive client outcomes.                           | Designs and evaluates organizational strategies and their impact on individuals, families, communities, and special populations.            |
| <b>Communicator</b>              | Effectively interacts with other health care workers.                                   | Participates in group process to promote the provision of nursing care.  | Uses appropriate communication strategies to effect positive outcomes for individuals and groups.   | Interacts with multi-disciplinary teams to manage the continuum of care for individuals, families, or groups.                      | Implements complex communication strategies to create, modify, evaluate, and enhance health care policy and systems.                  | Effectively disseminates and utilizes relevant research-based strategies to scientific communities, policy makers and the public.           |
| <b>Coordinator/ Collaborator</b> | Demonstrates efficient use of time, equipment, and supplies in managing own assignment. | Participates with the health care team to plan and implement client care.  | Participates in the development and revision of standards of care.  | Participates in the multidisciplinary management of client/organizational evaluative process.                                      | Directs the health care team in achieving optimal outcomes.   | Designs, implements, and evaluates multi-disciplinary models of management within health care systems.                                      |
| <b>Advocate</b>                  | Supports client rights and reports instances of abuse/neglect.                          | Identifies, reports, and seek resolution in discrepancies in policies and practices related to individual and family well-being. | Uses appropriate processes to support client decisions regarding care decisions.  | Develops, implements and evaluates strategies to support client care decisions.  | Challenges assumptions and explores alternative avenues to anticipate and design, and implement changes in health care.               | Creates and analyses health care models to support rights of individuals, families, groups, and special populations.                        |
| <b>Teacher/ Counselor</b>        | Reinforces organizational policies related to safety and health.                        | Identifies and responds to client situations that require instruction.   | Develops, evaluates and modifies teaching plans based on individual learning outcomes for clients and health care personnel.  | Designs and evaluates instructional programs that meet learning needs in clients, families, groups and health care personnel.      | Consults and collaborates with multi-disciplinary teams to design, manage, and implement education programs for specific populations. | Creates, implements and evaluates evidence-based educational programs to inform administration of best practices, and support optimal care. |
| <b>Scholar</b>                   | Updates and refines skills to enhance patient care.                                     | Demonstrates knowledge of current practice trends and delivery of care.  | Acquires knowledge to assist in modifying the delivery of care.   | Analyzes the impact of practice trends based on evidence and applies the findings to the delivery of health care.                  | Systematically formulates solutions to problems resulting from practice and contributes to the delivery of health care.               | Creates and synthesizes knowledge of nursing and health care systems to improve health care delivery.                                       |

Arizona Nurse Competency Model (continued)

**COMPETENCY MODEL**

**MEMBER OF PROFESSION**

| INTEGRATED CONCEPTS              | NURSING ASSISTANT   | LICENSED PRACTICAL NURSE   | ASSOCIATE DEGREE  | BACHELORS DEGREE IN NURSING  | MASTERS DEGREE IN NURSING   | DOCTORAL LEVEL  |
|----------------------------------|---|--|---|--|---|---|
| <b>Caregiver</b>                 | Demonstrates ethical and responsible behavior as a member of the nursing team and consistent with regulation. | Makes decisions and takes actions that are consistent with the standard of practical nursing practice, established policies, procedures, and licensing laws. | Makes decisions and takes actions that are consistent with the standard of registered nursing practice, established policies, procedures, and licensing laws. | Assumes a leadership role in the implementation of professional standards in nursing practice. | Evaluates and contributes to standards of nursing practice and practices consistent with advanced practice licensing regulations. | Creates and utilizes data bases to evaluate organizational practices.             |
| <b>Communicator</b>              | Demonstrates caring behavior and projects a positive image.   | Demonstrates ethical/legal behavior consistent with practical nurse standards of practice.   | Promotes nursing as a profession.   | Promotes public awareness of nursing's contribution to health care.                            | Explicates advanced nursing practice roles to the public, other health care providers, and policy makers.                         | Disseminates research to inform and advance the nursing profession.               |
| <b>Coordinator/ Collaborator</b> | Performs within a defined role and accepts delegation and supervision.  | Interacts with health care colleagues to promote legal and ethical practice.   | Develops collegial relationships for the purpose of development of the profession.  | Assumes leadership role in professional activities.  | Partners with consumers and other groups to promote nursing.  | Initiates and evaluates policy changes to promote the profession.                 |
| <b>Advocate</b>                  | Recognizes the rights of all individuals and respects differences.  | Demonstrates awareness of political influences on nursing and health care.   | Uses political processes to improve client care and promote nursing.  | Demonstrates leadership skills to advocate and influence nursing practice.                     | Influences the political environment of the nursing profession.   | Envisions and creates an environment that promotes an optimal future for nursing. |
| <b>Teacher/ Counselor</b>        | Explains nurse assistant care to clients and others.  | Communicates LPN scope of practice to clients and others.  | Communicates RN scope of practice and practice standards to clients and others.   | Communicates and differentiates levels of nursing practice.                                    | Communicates and promotes advanced practice roles in nursing.   | Communicates and promotes nursing research, leadership and clinical excellence.   |
| <b>Scholar</b>                   | Seeks educational opportunities to advance knowledge and skills.  | Identifies learning needs and establishes a plan for increasing knowledge and skills.  | Implements a plan of continued professional growth.   | Fosters professional and personal growth in self and health care team members.                 | Plans and implements evidence-based professional development programs for self and others.  | Creates a climate that promotes scholarly inquiry and advances the profession.    |

This document can be found at:

<http://www.azbn.org/documents/education/Competency%20Model%20Integrated.pdf>

# Appendix F: State Boards of Nursing References

| State          | Reference   | Pages         |
|----------------|---|---------------|
| Alabama        | <a href="http://abn.state.al.us/main/downloads/admin-code/Chapter%20610-X-3.pdf">http://abn.state.al.us/main/downloads/admin-code/Chapter%20610-X-3.pdf</a>   |               |
| Alaska         | <a href="http://www.commerce.state.ak.us/occ/pub/NursingStatutes.pdf">www.commerce.state.ak.us/occ/pub/NursingStatutes.pdf</a>  | 9-11          |
| Arizona        | <a href="http://www.azbn.org/documents/npa/Rules.pdf">www.azbn.org/documents/npa/Rules.pdf</a>  | 8-15          |
| Arkansas       | <a href="http://www.arsbn.org/pdfs/practice_act/chap4.pdf">www.arsbn.org/pdfs/practice_act/chap4.pdf</a>  |               |
| California     | <a href="http://www.rn.ca.gov/npa/pdf/title16.pdf">www.rn.ca.gov/npa/pdf/title16.pdf</a>  | 56-62         |
| Colorado       | <a href="http://www.dora.state.co.us/nursing/statutesandrules/ChapterII.pdf">www.dora.state.co.us/nursing/statutesandrules/ChapterII.pdf</a>  |               |
| Connecticut    | Practical Nurse Education:<br><a href="http://www.dph.state.ct.us/phc/docs/127_Practical_Nursing_Educa.doc">www.dph.state.ct.us/phc/docs/127_Practical_Nursing_Educa.doc</a><br>Professional Nurse Education:<br><a href="http://www.dph.state.ct.us/phc/docs/126_Registered_Nursing_Educ.doc">www.dph.state.ct.us/phc/docs/126_Registered_Nursing_Educ.doc</a>   |               |
| Delaware       | <a href="http://www.state.de.us/research/AdminCode/title24/1900%20of%20Nursing.shtml#TopOfPage">www.state.de.us/research/AdminCode/title24/1900%20of%20Nursing.shtml#TopOfPage</a>  | 3-14          |
| Florida        | <a href="http://fac.dos.state.fl.us/faonline/chapter64.pdf">http://fac.dos.state.fl.us/faonline/chapter64.pdf</a>   | 419-426       |
| Georgia        | Practical Nurse Education:<br><a href="http://www.sos.state.ga.us/acrobat/PLB/Rules/chapt400.pdf">www.sos.state.ga.us/acrobat/PLB/Rules/chapt400.pdf</a><br>Professional Nurse Education:<br><a href="http://www.sos.state.ga.us/acrobat/PLB/Rules/chapt410.pdf">www.sos.state.ga.us/acrobat/PLB/Rules/chapt410.pdf</a>   | 13-35<br>6-17 |
| Hawaii         | <a href="http://www.hawaii.gov/dcca/areas/pvl/main/har/">www.hawaii.gov/dcca/areas/pvl/main/har/</a>  | 13-26         |
| Idaho          | <a href="http://www.adm.idaho.gov/adminrules/rules/idapa23/0101.pdf">www.adm.idaho.gov/adminrules/rules/idapa23/0101.pdf</a>  | 42-54         |
| Illinois       | <a href="http://www.idfpr.com/dpr/WHO/ar/rn.asp">www.idfpr.com/dpr/WHO/ar/rn.asp</a>  | 7-11          |
| Indiana        | <a href="http://www.in.gov/pla/bandc/isbn/nursing_compilation.pdf">www.in.gov/pla/bandc/isbn/nursing_compilation.pdf</a>  | 5-13          |
| Iowa           | <a href="http://www.legis.state.ia.us/Rules/Current/iac/655/6552/6552.pdf">www.legis.state.ia.us/Rules/Current/iac/655/6552/6552.pdf</a>  |               |
| Kansas         | <a href="http://www.ksbn.org/approvedregs.htm">www.ksbn.org/approvedregs.htm</a>  |               |
| Kentucky       | Practical Nurse Education: <a href="http://www.lrc.state.ky.us/kar/201/020/330.htm">www.lrc.state.ky.us/kar/201/020/330.htm</a><br>Professional Nurse Education : <a href="http://www.lrc.state.ky.us/kar/201/020/320.htm">www.lrc.state.ky.us/kar/201/020/320.htm</a><br>Educational/Clinical Facilities: <a href="http://www.lrc.state.ky.us/kar/201/020/350.htm">www.lrc.state.ky.us/kar/201/020/350.htm</a> |               |
| Louisiana      | <a href="http://www.lsnb.state.la.us/documents/rules/fullrules.pdf">www.lsnb.state.la.us/documents/rules/fullrules.pdf</a>  | 37-52         |
| Maine          | <a href="ftp://ftp.state.me.us/pub/sos/cec/rcn/apa/02/380/380c007.doc">ftp://ftp.state.me.us/pub/sos/cec/rcn/apa/02/380/380c007.doc</a>   |               |
| Maryland       | <a href="http://www.dsd.state.md.us/comar">www.dsd.state.md.us/comar</a>  |               |
| Massachusetts  | <a href="http://www.mass.gov/Eeohhs2/docs/dph/regs/244cmr006.pdf">www.mass.gov/Eeohhs2/docs/dph/regs/244cmr006.pdf</a>  |               |
| Michigan       | <a href="http://www.state.mi.us/orr/emi/admincode.asp?AdminCode=Single&amp;Admin_Num=33810101&amp;Dpt=CH&amp;RngHigh=">http://www.state.mi.us/orr/emi/admincode.asp?AdminCode=Single&amp;Admin_Num=33810101&amp;Dpt=CH&amp;RngHigh=</a>   |               |
| Minnesota      | <a href="http://www.revisor.leg.state.mn.us/">www.revisor.leg.state.mn.us/</a>  |               |
| Mississippi    | <a href="http://www.msbn.state.ms.us/pdf/nursingpracticelaw2005.pdf">www.msbn.state.ms.us/pdf/nursingpracticelaw2005.pdf</a>  | 15            |
| Missouri       | <a href="http://www.sos.mo.gov/adrules/csr/current/4csr/4c200-2.pdf">www.sos.mo.gov/adrules/csr/current/4csr/4c200-2.pdf</a>  |               |
| Montana        | <a href="http://mt.gov/dli/bsd/license/bsd_boards/nur_board/pdf/nur_rules.pdf">http://mt.gov/dli/bsd/license/bsd_boards/nur_board/pdf/nur_rules.pdf</a>   | 31-50         |
| Nebraska       | <a href="http://www.sos.state.ne.us/business/regsearch/Rules/Health_and_Human_Services_System/Title-172/Chapter-97.pdf">www.sos.state.ne.us/business/regsearch/Rules/Health_and_Human_Services_System/Title-172/Chapter-97.pdf</a>  |               |
| Nevada         | <a href="http://www.leg.state.nv.us/NAC/NAC-632.html#NAC632Sec600">www.leg.state.nv.us/NAC/NAC-632.html#NAC632Sec600</a>  |               |
| New Hampshire  | <a href="http://www.state.nh.us/nursing/docs/rules.doc">www.state.nh.us/nursing/docs/rules.doc</a>  | 58-79         |
| New Jersey     | <a href="http://www.state.nj.us/lps/ca/nursing/nurselaws.pdf">www.state.nj.us/lps/ca/nursing/nurselaws.pdf</a>  | 41-52         |
| New Mexico     | <a href="http://www.state.nm.us/clients/nursing/pdf/nmacpart3.pdf">www.state.nm.us/clients/nursing/pdf/nmacpart3.pdf</a>  |               |
| New York       | <a href="http://www.op.nysed.gov/part52-12.htm">www.op.nysed.gov/part52-12.htm</a>  |               |
| North Carolina | <a href="http://www.ncbon.com/forms/Rule300Section1.pdf">www.ncbon.com/forms/Rule300Section1.pdf</a>  |               |
| North Dakota   | <a href="http://www.legis.nd.gov/information/acdata/html/54-03.2.html">www.legis.nd.gov/information/acdata/html/54-03.2.html</a>  |               |
| Ohio           | <a href="http://www.nursing.ohio.gov/pdfs/NewLawRules/CHAPT-5.pdf">www.nursing.ohio.gov/pdfs/NewLawRules/CHAPT-5.pdf</a>  |               |

| State          | Reference   | Pages          |
|----------------|---|----------------|
| Oklahoma       | <a href="http://www.ok.gov/nursing/rules05.pdf">www.ok.gov/nursing/rules05.pdf</a>  | 10-17          |
| Oregon         | <a href="http://www.osbn.state.or.us/OSBN/pds/npa/Div21.pdf">www.osbn.state.or.us/OSBN/pds/npa/Div21.pdf</a>  |                |
| Pennsylvania   | <a href="http://www.pacode.com/secure/data/049/chapter21/chap21toc.html#21.161">www.pacode.com/secure/data/049/chapter21/chap21toc.html#21.161</a>  |                |
| Rhode Island   | <a href="http://www.rules.state.ri.us/rules/released/pdf/DOH/DOH_3270.pdf">www.rules.state.ri.us/rules/released/pdf/DOH/DOH_3270.pdf</a>  | 19-23          |
| South Carolina | <a href="http://www.scstatehouse.net/coderegs/c091.htm">www.scstatehouse.net/coderegs/c091.htm</a>  |                |
| South Dakota   | <a href="http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=20:48:07">http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=20:48:07</a>   |                |
| Tennessee      | Practical Nurse Education: <a href="http://state.tn.us/sos/rules/1000/1000-01.pdf">http://state.tn.us/sos/rules/1000/1000-01.pdf</a><br>Professional Nurse Education: <a href="http://state.tn.us/sos/rules/1000/1000-02.pdf">http://state.tn.us/sos/rules/1000/1000-02.pdf</a> | 18-25<br>19-27 |
| Texas          | <a href="ftp://www.bne.state.tx.us/bne-rr-0905.pdf">ftp://www.bne.state.tx.us/bne-rr-0905.pdf</a>   | 27-54          |
| Utah           | <a href="http://www.dopl.utah.gov/licensing/statutes_and_rules/R156-31b.pdf">www.dopl.utah.gov/licensing/statutes_and_rules/R156-31b.pdf</a>  | 9-15           |
| Vermont        | <a href="http://vtprofessionals.org/opr1/nurses/forms/nursingrules.pdf">http://vtprofessionals.org/opr1/nurses/forms/nursingrules.pdf</a>   | 7-16           |
| Virginia       | <a href="http://www.dhp.virginia.gov/nursing/nursing_laws_regs.htm">www.dhp.virginia.gov/nursing/nursing_laws_regs.htm</a>  | 7-13           |
| Washington     | <a href="http://apps.leg.wa.gov/RCW/default.aspx?cite=18.79.150">http://apps.leg.wa.gov/RCW/default.aspx?cite=18.79.150</a>   |                |
| West Virginia  | Practical Nurse Education: <a href="http://www.lpnboard.state.wv.us">www.lpnboard.state.wv.us</a><br>Professional Nurse Education: <a href="http://www.wvsos.com/csrdocs/worddocs/19-01.doc">www.wvsos.com/csrdocs/worddocs/19-01.doc</a>                                       |                |
| Wisconsin      | <a href="http://www.legis.state.wi.us/rsb/code/n/n001.pdf">www.legis.state.wi.us/rsb/code/n/n001.pdf</a>  |                |
| Wyoming        | <a href="http://nursing.state.wy.us">http://nursing.state.wy.us</a>   |                |

# Appendix G: Health Care Technology

| TECHNOLOGY                | EXAMPLES OF DEVICES AND SOFTWARE  | EXAMPLES OF APPLICATIONS  |
|---------------------------|---|---|
| Remote Monitoring         | <ul style="list-style-type: none"> <li>• Sensors</li> <li>• Instruments</li> <li>• Ultrasound</li> </ul>  | <ul style="list-style-type: none"> <li>• Bio-defense</li> <li>• Telehomecare</li> </ul>   |
| Diagnostics               | <ul style="list-style-type: none"> <li>• Otoscope</li> <li>• Stethoscope</li> <li>• EKG</li> </ul>  | <ul style="list-style-type: none"> <li>• Consultations</li> <li>• Telehomecare</li> </ul>   |
| Videoconferencing         | <ul style="list-style-type: none"> <li>• Cameras (Videocams, Webcams)</li> <li>• Computer-based desktops</li> <li>• Portable communications and data systems</li> </ul>                             | <ul style="list-style-type: none"> <li>• Consultations</li> <li>• Teledermatology</li> <li>• Telementalhealth</li> </ul>  |
| Digital Imaging           | <ul style="list-style-type: none"> <li>• Instruments</li> <li>• Media (e.g. film, magnetic tape)</li> <li>• Scanners/Viewers</li> <li>• Digital cameras</li> <li>• Videocams with scopes</li> </ul> | <ul style="list-style-type: none"> <li>• Telepathology</li> <li>• Teleradiology</li> <li>• Teledentistry</li> <li>• Teledermatology</li> <li>• TeleENT, TeleGI</li> </ul>   |
| Information Technology    | <ul style="list-style-type: none"> <li>• Data storage systems</li> <li>• Servers</li> <li>• Software/Informatics/Middleware</li> </ul>  | <ul style="list-style-type: none"> <li>• Electronic medical record</li> <li>• Data mining</li> <li>• Syndromic surveillance</li> <li>• Web portals</li> <li>• Decision-support systems</li> <li>• Administration</li> </ul> |
| Networking/ Interfaces    | <ul style="list-style-type: none"> <li>• Hubs, routers, servers</li> <li>• "Black boxes"</li> <li>• System software</li> </ul>  | <ul style="list-style-type: none"> <li>• Interoperability</li> <li>• Internet/Intranet</li> <li>• Hub and spoke networks</li> <li>• Mobile data transmission</li> </ul>   |
| Robotics/ Remote Controls | <ul style="list-style-type: none"> <li>• Instruments</li> <li>• Controls</li> <li>• Viewers</li> </ul>  | <ul style="list-style-type: none"> <li>• Telesurgery</li> <li>• Telepathology</li> <li>• Homeland security</li> </ul>   |
| Store-and-Forward         | <ul style="list-style-type: none"> <li>• Data/Image/Video/audio card capture/scanners</li> <li>• Computer/camera/microphone &amp; image management software</li> </ul>                              | <ul style="list-style-type: none"> <li>• Electronic medical record</li> <li>• Report generator</li> </ul>   |
| Simulation and Training   | <ul style="list-style-type: none"> <li>• Multi-media graphics</li> <li>• Software</li> <li>• Audio-visual</li> </ul>  | <ul style="list-style-type: none"> <li>• eLearning</li> <li>• Curriculum</li> <li>• Conferencing</li> </ul>   |

\* U.S. Department of Commerce Office of Technology Policy, 2004

## Appendix H: References

- All Nursing Schools. (2006). Pennsylvania Nurse Educator Programs.  
<http://www.allnursingschools.com/find/results.php?program=nurse-educator&st=PA&submit=Find+a+School>
- American Assembly of Men in Nursing. (2006). Home Page. <http://www.aamn.org>
- American Association of Colleges of Nursing. (1999, April). Faculty shortages intensify nation's nursing deficit. American Association of Colleges of Nursing Issue Bulletin. <http://www.aacn.nche.edu/publications/issues/IB499WB.htm>
- . (2000). Distance technology in nursing education: Assessing a new frontier. Journal of Professional Nursing, 16(2).
- . (2001). Expand the Reach of the Nurse Education Act with New Initiatives: AACN Recommendations to Address the Nursing Shortage.  
<http://www.aacn.nche.edu/Government/nea2.htm>
- . (2002). Using strategic partnerships to expand nursing education programs: Successful partnership profiles. AACN Issue Bulletin.  
<http://www.aacn.nche.edu/Publications/issues/Oct02.htm>
- . (2003). Faculty shortages in baccalaureate and graduate nursing programs: Scope of the problem and strategies for expanding the supply.  
<http://www.aacn.nche.edu/Publications/WhitePapers/FacultyShortages.htm>
- . (2004a). Special Survey on Vacant Faculty Positions: July 2004.  
<http://www.aacn.nche.edu/IDS>
- . (2004b). Qualified applications accepted and enrolled and number of vacant seats by type of nursing program in Pennsylvania schools. Institutional Data Systems.
- . (2004c). Your Nursing Career: A Look at the Facts.  
<http://www.aacn.nche.edu/education/Career.htm>
- . (2005). Nursing Faculty Shortage Fact Sheet.  
<http://www.aacn.nche.edu/Media/Backgrounders/facultyshortage.htm>
- . (2005, July). Special Survey of AACN Membership on Vacant Faculty Positions for Academic Year 2005-2006, July 2005.  
<http://www.aacn.nche.edu/IDS/pdf/FacultyVacancy05.pdf>
- Anderson, C. A. (1998). Academic nursing: A desirable career? Nursing Outlook, 46(1), 5-6.

- Baldwin, K., Walker, C., & Evans, E. (2004, December). Increasing nursing faculty in rural Texas through online education. Journal of Nursing Education, 43(12), 555-557.
- Bay Area Nursing Resource Center (2003). The Nursing Resource Center. Re-Source. <http://www.cinhc.org/programs/documents/NRCflyer.pdf>
- Benner, P. (1984). From Novice to Expert: Excellence and Power in Clinical Nursing Practice. Menlo Park: Addison-Wesley.
- Beyea, S. (2004, October). Human patient simulation: a teaching strategy. Association of Operating Room Nurses Journal.
- Boyer, S. (2006). Vermont Nurse Internship Project. [www.vnip.org](http://www.vnip.org)
- Byrne, M. (2004, January). It was huge! Nursing students' first experience at AORN Congress. Association of Operating Room Nurses Journal.
- Burns, Helen. (2006, March 20). University of Pittsburgh School of Nursing. Phone Interview.
- Calabrese, Danielle. (2006, March 25). Student Nurses Association of Pennsylvania Board Meeting. Personal Interview.
- Carol, R. (2006). Discrimination in nursing school: Thing of the past or alive and well? MinorityNurse.com. <http://www.minoritynurse.com/features/undergraduate/082406b.html>
- Commission on Nursing Practice and Georgia Nurses Association. (2005, May-July). Clinical faculty-student ratio survey update. Georgia Nursing.
- DeYoung, S., Bliss, J., & Tracy, J. (2002, November-December). The nursing faculty shortage: Is there hope? Journal of Professional Nursing, 18(6), 313-319.
- Dreher, H. M. (2005). Have you considered becoming a nursing professor? Pennsylvania State Nurses Association Website. [www.psna.org/c\\_profdev\\_educator.htm](http://www.psna.org/c_profdev_educator.htm)
- Duke University Department of Human Resources. (2005). Duke University Health System Job Description: Clinical Nurse Educator. [http://hr.duke.edu/jobs/descr\\_duhs/select.cfm?id=5021](http://hr.duke.edu/jobs/descr_duhs/select.cfm?id=5021)
- Florida Center for Nursing. (2005a). Report: Nurse Education in Florida: January 2005 Survey. <http://www.flcenterfornursing.org>
- . (2005b). Nursing Education Grants: SUCCEED-Florida Nursing Education Grant Program. <http://www.flcenterfornursing.org/news/>
- Frankola, K. (2001, June 1). The e-Learning Taboo: High dropout rates in online courses. Syllabus, 14(11), 14-16.

- Gallagher, Linda. (2006, March 17). Community College of Beaver County School of Nursing. Phone Interview.
- Gance-Cleveland, B. & Gilbert, L.H. (2001, April). Connecting classroom, clinic, and community: Pediatric nurse practitioner student and faculty assessment of clinical experience at faculty practice sites. Journal of Nursing Education, 40(4), 187-190.
- Gazza, Beth. (2006, March 22). Butler County Community County School of Nursing. Phone Interview.
- Grady, J. (2005, October 7). Invitational National Telehealth Nursing Research Conference Co-sponsored by Mount Aloysius College. <http://mtaloy-live.dotmarketing.net>
- Grady, J. & Berkebile, C. (2004). Nursing Telehealth Applications Initiative: A research project for nursing education and practice. Telemedicine Information Exchange. <http://tie.telemed.org/articles>
- Groopman, J. (2005, May 2). A model patient: How simulators are changing the way doctors are trained. The New Yorker Annals of Medicine. <http://www.meti.com/downloads/NewYorker.pdf>
- Gormley, D. (2003, April). Factors affecting job satisfaction in nurse faculty: A meta-analysis. Journal of Nursing Education, 42(4), 174-178.
- Harvard Center for Medical Simulation. (2006). Home Page. <http://www.harvardmedsim.org/cms/>
- Henneman, E. & Cunningham, H. (2005). Using clinical simulation to teach patient safety in an acute/critical care nursing course. Nurse Educator, (30)4, 172-177.
- Hilton, L. (2001, May 14). A few good men: Male nurses defy stereotypes and discrimination to find satisfaction in a female-dominated profession.. NurseWeek. <http://www.nurseweek.com/news/features/01-05/men.html>
- Hinshaw, A. S. (2001, January 31). A continuing challenge: The shortage of educationally prepared nursing faculty. Online Journal of Issues in Nursing. [http://www.nursingworld.org/ojin/topic14/tpc14\\_3.htm](http://www.nursingworld.org/ojin/topic14/tpc14_3.htm)
- Hospital and Healthsystem Association of Pennsylvania. (2004, May). Nursing Workforce Investment Strategies: Internships and Residency Programs. [http://www.haponline.org/downloads/Nurse\\_Internship\\_and\\_Residency\\_Programs\\_May\\_2004.pdf](http://www.haponline.org/downloads/Nurse_Internship_and_Residency_Programs_May_2004.pdf)
- Institute of Medicine of the National Academies. (1999, November 1). To Err is Human: Building a Safer Health System. Washington, D.C.: Author.

- Joint Commission on Accreditation of Healthcare Organizations. (2002). Health Care at the Crossroads: Strategies for Addressing the Evolving Nursing Crisis. [http://www.jointcommission.org/NR/rdonlyres/5C138711-ED76-4D6F-909F-B06E0309F36D/0/health\\_care\\_at\\_the\\_crossroads.pdf](http://www.jointcommission.org/NR/rdonlyres/5C138711-ED76-4D6F-909F-B06E0309F36D/0/health_care_at_the_crossroads.pdf)
- Karolinska Institutet Department of Learning, Informatics, Management and Ethics (LIME). (2006) Web Based Simulation of Patients. <http://websp.lime.ki.se/>
- Kessler, T. (2003, September). Solutions to finding graduate clinical sites for advanced health assessment. Journal of Nursing Education, 42(9), 421-422.
- Lauffer, Becky. (2006, March 16). Westmoreland County Community College School of Nursing. Phone Interview.
- Levinson, M. (2005, July 15). Robo-Patient hits the web. CIO Magazine. [http://www.cio.com/archive/071502/tl\\_simulations.html](http://www.cio.com/archive/071502/tl_simulations.html)
- Louisiana Health Careers. (2005, July 25). Stipend helps nurses trade hospital for classroom. [http://www.lahealthcareers.com/news\\_detail.cfm?AID=264](http://www.lahealthcareers.com/news_detail.cfm?AID=264)
- Lucas, J. (2006). Male Nurse Magazine Home Page. <http://malenursemagazine.com>
- Lunday, K. (1999, July). Developing clinical learning sites for undergraduate nursing students. Association of Operating Room Nurses Journal. [http://search.looksmart.com/p/articles/mi\\_m0FSL/is\\_1\\_70/ai\\_55182628](http://search.looksmart.com/p/articles/mi_m0FSL/is_1_70/ai_55182628)
- Maryland Statewide Commission on the Crisis in Nursing. (2004). Nursing Faculty Careers. [http://www.mbon.org/commission/faculty\\_paper/index.html](http://www.mbon.org/commission/faculty_paper/index.html)
- Medley, C. & Horne, C. (2005, January). Using simulation technology for undergraduate nursing education, Journal of Nursing Education, (44)1, 31-34.
- METI, Inc. (2005, September) METI LiVE: Learning in a Virtual Environment Concept Paper. <http://www.meti.com/downloads/METI%20LiVE%20WP.pdf>
- Metropolitan State University. (2006). The HealthPartners Simulation Center for Public Safety at Metropolitan State University Website. <http://www.hpsimcenter.com>
- Minnesota State Colleges and Universities. (2004, Spring). Simulation centers aid expansion of nursing training. Performance Newsletter. <http://www.mnscu.edu/media/performance/2004/spring2004/nursingtraining.html>
- National Center for Workforce Analysis. (2002). Projected Supply, Demand, and Shortages of Registered Nurses: 2000 – 2030. Washington, DC: Author.
- National Coalition of Ethnic Minority Nurse Associations. (2006). What is NCEMNA? <http://www.ncemna.org/whatisncemna.asp>

- National Council of State Boards of Nursing. (2002). Report of findings from the 2001 employers survey. NCSBN Research Brief 3. Chicago: Author.
- National Institute of Nursing Research. (2005). Mission Statement. <http://ninr.nih.gov/ninr/research/diversity/mission.html>
- National League for Nursing. (2006, July). Nurse Educators 2006: A Report of the Faculty Census Survey of RN and Graduate Programs.
- . (2005, May 9) Position statement: Transforming nursing education. <http://www.nln.org/aboutnln/PositionStatements/transforming052005.pdf>
- . (2002, May 18). Position statement: The preparation of nurse educators. <http://www.nln.org/aboutnln/PositionStatements/prepofnursed02.htm>
- Neuman, L. (2006, Jan.-Feb.). Creating new futures in nursing education: Envisioning the evolution of e-nursing education. Nursing Education Perspectives, 27(1), 12-15.
- Nolan, T. (2006). Unit 2: Benner's Stages of Clinical Competence. Introduction to Professional Nursing. <http://www.sonoma.edu/users/n/nolan/n312/benner.htm>
- Nurses for a Healthier Tomorrow. (2004). Career Info: Nurse Educator. [http://www.nursesource.org/nurse\\_educator.html](http://www.nursesource.org/nurse_educator.html)
- Ohio Board of Nursing. (2005, March 4). Memo to Prospective Ohio Nurse Education Grant Program Applicants. <http://www.nursing.ohio.gov>
- Oregon Governor's Workforce Initiative. (2005, June). Oregon Simulation Alliance. <http://www.oregon.gov/WORKSOURCE/OWIB/healthcare/OSAoverviewJune05.doc>
- Orlovski, C. (2005, June 15) BabySIM provides emergency preparation for smallest patients. Nursezine.com. <http://www.meti.com/BabySim05/BabySim/media.html>
- Patow, C. (2005, March-April). Advancing medical education and patient safety through simulation learning. Patient Safety & Quality Healthcare. <http://www.psqh.com/marapr05/simulation.html>
- Pennsylvania Center for Health Careers. (2004, October 20). Addressing Pennsylvania's Nursing Education System Capacity: Recommendation Report of the Pennsylvania Center for Health Careers. [http://www.paworkforce.state.pa.us/about/lib/about/pdf/health\\_careers/panursing\\_educationsystemcapacityrecommendations1.pdf](http://www.paworkforce.state.pa.us/about/lib/about/pdf/health_careers/panursing_educationsystemcapacityrecommendations1.pdf)
- . (2005). The Licensed Practical Nurse Workforce in Pennsylvania: Supply/Demand Report Fall 2005. [http://www.paworkforce.state.pa.us/about/lib/about/pdf/health\\_careers/lpn\\_report.pdf](http://www.paworkforce.state.pa.us/about/lib/about/pdf/health_careers/lpn_report.pdf)

- . (2005). The Registered Nurse Workforce in Pennsylvania: Supply/Demand Report Summer 2005. [http://www.paworkforce.state.pa.us/about/lib/about/pdf/health\\_careers/rn\\_report.pdf](http://www.paworkforce.state.pa.us/about/lib/about/pdf/health_careers/rn_report.pdf)
- . (2006). State Boards of Nursing Education Program Regulations Analysis. Harrisburg: Author.
- Pennsylvania Department of State. (2003). The Pennsylvania Code Title 49: Professional and Vocational Standards. Chapter 21: State Board of Nursing. <http://pacode.com/secure/data/049/Chapter21/049/0021.pdf>
- Pennsylvania Department of Health. (2006, August). State Health Improvement Plan Special Report on the Characteristics of the Registered Nurse Population in Pennsylvania: Combined Data From the Survey of Registered Nurses Renewing Licenses in April 2004, October 2004, April 2005, October 2005, 2. [http://www.dsf.health.state.pa.us/health/lib/health/Ship/RNWAVE2\\_final.pdf](http://www.dsf.health.state.pa.us/health/lib/health/Ship/RNWAVE2_final.pdf)
- . (2006, February). State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on Data from Nursing Education Program Annual Reports, 2004 (3). [http://www.dsf.health.state.pa.us/health/lib/health/Nurse\\_Education\\_Report\\_1-25-06\\_FINAL.pdf](http://www.dsf.health.state.pa.us/health/lib/health/Nurse_Education_Report_1-25-06_FINAL.pdf)
- . (2005, March). State Health Improvement Plan Special Report on the Characteristics of the Licensed Practical Nurse Population in Pennsylvania: A Report on the June, 2004 Survey of Licensed Practical Nurses, 2. <http://www.dsf.health.state.pa.us/health/lib/health/ship/LPN2March05.pdf>
- . (2004, November). State Health Improvement Plan Special Report on the Characteristics of the Registered Nurse Population in Pennsylvania: A Report on the April 2004 Survey of Registered Nurses, 2(1). <http://www.dsf.health.state.pa.us/health/lib/health/RNReportNov2004.PDF>
- . (2004, June). State Health Improvement Plan White Paper: The Nurse Workforce in Pennsylvania. <http://www.dsf.health.state.pa.us/health/lib/health/nursewhitepaper.pdf>
- . (2006, February). State Health Improvement Plan Report on the Status of Nursing Education Programs in Pennsylvania: A Report on Data from Nursing Education Program Annual Reports, 2004 (3). [http://www.dsf.health.state.pa.us/health/lib/health/Nurse\\_Education\\_Report\\_1-25-06\\_FINAL.pdf](http://www.dsf.health.state.pa.us/health/lib/health/Nurse_Education_Report_1-25-06_FINAL.pdf)
- Pennsylvania Higher Education Foundation & Higher Education Foundation. (2005). Nursing Education Initiative: Program Guidelines and Applications. Harrisburg, PA: Author.
- Pennsylvania State Board of Nursing. (2006). Agency Data Form. [http://www.dos.state.pa.us/bpoa/lib/bpoa/20/nurs\\_board/agency\\_data\\_form.pdf](http://www.dos.state.pa.us/bpoa/lib/bpoa/20/nurs_board/agency_data_form.pdf)

- Pennsylvania Workforce Investment Board. (2006a). Health Care Industry Cluster: Licensed practical and vocational nurses. Job Seekers: Careers in Demand. : <http://www.paworkforce.state.pa.us/jobseekers/cwp/view.asp?a=464&q=154633>
- . (2006b). Health Care Industry Cluster: Registered Nurses. Job Seekers: Careers in Demand. <http://www.paworkforce.state.pa.us/jobseekers/cwp/view.asp?a=464&q=154759>
- Pfadt, Ellen. (2006, March 31). Edinboro University of Pennsylvania School of Nursing. Phone Interview.
- Purdue University. (2005) Center for Nursing Education Website. <http://www.nursing.purdue.edu/centersandclinics/cne/>
- Raines, C. (2002). Managing Millenials. Generations at Work. <http://www.generationsatwork.com/articles/millenials.htm>
- Rauen, C. (2004, June). Simulation as a teaching strategy for nursing education and orientation in cardiac surgery. Critical Care Nurse. [http://search.looksmart.com/p/articles/mi\\_m0NUC/is\\_3\\_24/ai\\_n6168990](http://search.looksmart.com/p/articles/mi_m0NUC/is_3_24/ai_n6168990)
- Scanlon, B. (2005, November 14). For students in paramedic course, high-tech manikin is no dummy. Rocky Mountain News. <http://www.meti.com/downloads/RockyMTNews.pdf>
- SearchWebServices. (2000, September 14). Web-Based Training. [http://searchwebservices.techtarget.com/sDefinition/0,290660,sid26\\_gci332239,00.html](http://searchwebservices.techtarget.com/sDefinition/0,290660,sid26_gci332239,00.html)
- Seropian, M. (2005). Simulation Education: Not Just a Manikin. [http://www.iamse.org/development/2005/webcast\\_102005.pdf](http://www.iamse.org/development/2005/webcast_102005.pdf)
- Seropian, M., Brown, K., Gavilanes, J.S., & Driggers, B. (2004, April). Simulation: Not just a manikin, Journal of Nursing Education, 43(4), 164-169.
- Shere, J. (2004, Spring). Encouraging nursing through research. Indiana University Research and Creative Activity Magazine: Undergraduate Issue. (26)2. <http://www.indiana.edu/~rcapub/v26n2/nursing.shtml>
- Shute, M. (2006, January 23). Lights. Camera. Robot action! U.S. News & World Report. [http://www.usnews.com/usnews/health/articles/060123/23pioneer\\_2.htm#page\\_top](http://www.usnews.com/usnews/health/articles/060123/23pioneer_2.htm#page_top)
- Society for Simulation in Healthcare. (2006). Home Page. Accessed January 25, 2006. <http://ssih.org/>
- State of California Employment Development Department. (2005). Notice of Grant Opportunities for Rural Nursing Clinical Simulation Center Grants. <http://www.edd.ca.gov/wiarep/wiasfprnqa.htm>

- Stringer, H. (2002, June 11). Fruits of labor. NurseWeek.  
[http://www.nurseweek.com/news/features/02-06/security\\_print.html](http://www.nurseweek.com/news/features/02-06/security_print.html)
- United States Bureau of Labor Statistics. (2004). Employed persons by industry and sex, 2003-04 annual averages. Women in the Labor Force: A Databook.  
<http://www.bls.gov/cps/wlf-table13-2005.pdf>
- United States Congress. (2001, January 12). Department of Health and Human Services Health Care Financing Administration. Federal Register, 66(9), 3358-3376.
- United States Department of Commerce Office of Technology Policy. (2004). Innovation, Demand, and Investment in Telehealth: February 2004.  
<http://www.technology.gov/reports/TechPolicy/T>
- U.S. Department of Health and Human Services, U.S. Health Resources and Services Administration, Bureau of Health Professions, National Center for Health Workforce Analysis. (2002, July). Projected Supply, Demand, and Shortages of Registered Nurses: 2000 – 2020. Washington, DC: Author.
- . (2004, March). The Registered Nurse Population: National Sample Survey of Registered Nurses, Preliminary Findings.  
<ftp://ftp.hrsa.gov/bhpr/nursing/rnpopulation/theregisterednursepopulation.pdf>
- . Office for the Advancement of Telehealth. (2001, January). Telemedicine Report to Congress: January 2001. <ftp://ftp.hrsa.gov/telehealth/report2001.pdf>
- University of Arizona. (2005, April 26). University of Arizona: Undergraduate Preceptorship Guidelines. [http://www.registrar.arizona.edu/forms/Preceptorship\\_Guidelines\\_4-05.pdf](http://www.registrar.arizona.edu/forms/Preceptorship_Guidelines_4-05.pdf)
- University of Pennsylvania. (2001, July 23). Faculty and Academic Administrators Handbook: A Selection of Policies and Procedures of the University of Pennsylvania. [http://www.upenn.edu/assoc-provost/handbook/ii\\_b\\_3.html](http://www.upenn.edu/assoc-provost/handbook/ii_b_3.html)
- University of New Mexico. (2005). Critical Thinking in Nursing: Resources for Faculty and Students. <http://hsc.unm.edu/consg/conct/>
- University of Texas at El Paso & El Paso Community College. (2006). RN Preceptor Training: Introduction and Welcome.  
<http://www.epcc.edu/nursing/preceptor/1p.php>
- University of Texas. (2004). Becoming an effective preceptor. University of Texas College of Pharmacy Website. <http://www.utexas.edu/pharmacy/general/experiential/practitioner/effective/toc.html>
- Villanova University. (2005, December 20). Villanova Nursing enhances its simulation technology. Villanova Nursing News and Archives.  
[http://www.villanova.edu/nursing/newsevents/news.htm?page=2005\\_12\\_20.htm](http://www.villanova.edu/nursing/newsevents/news.htm?page=2005_12_20.htm)

Yecko, K. (2006, October 5). Personal communication.

Zungolo, Eileen. (2006, March 23). Duquesne University School of Nursing.  
Personal Interview.

# Appendix I: Clinical Education Task Force Members

## Co-Chairs

| Name                   | Title/Organization  |
|------------------------|---|
| Patty Knecht, MSN, RN  | Director of Practical Nursing<br>Center for Arts and Technology, Brandywine Campus                  |
| Lynn Leighton, MHA, RN | VP, Professional and Clinical Services, Hospital and Healthsystem Association of Pennsylvania (HAP) |

## Members

| Name                                    | Title/Organization  |
|---|---|
| Kathy Black, DNSC, RNC                  | Temple University   |
| Mary Bowen, CRNP, DNS, JD, CNAA         | Vice Chair and Director of Graduate Programs, Thomas Jefferson University's School of Nursing and State Board of Nursing  |
| Helen Burns, Ph.D.                      | Associate Dean for Clinical Education, University of Pittsburgh School of Nursing   |
| Danielle Calabrese, RN                  | President, Student Nurses Association of Pennsylvania   |
| Jacquelyn Corcoran, EdD(c), RN          | Dean, Frankford Hospital School of Nursing  |
| Lana deRuyter, MSN, RN                  | Acting Dean of Allied Health and Nursing, Delaware County Community College   |
| Michele Gerwick, Ph.D.                  | Chairperson, Allied Health and Nursing, Indiana University of Pennsylvania  |
| Mary Ellen Smith Glasgow, Ph.D., RN, CS | Associate Dean for Undergraduate Programs in Health Professions and Nursing, Master's Programs in Nursing, and CNE, Drexel University College of Nursing and Health Professions |
| Rosanna Henry, MSN, RN                  | Director, Learning Resource Lab, Duquesne University School of Nursing  |
| John Kays                               | Manager of Staff Development, Pinnacle Health System  |
| Marina Matthew, RHIA                    | Director, Division of Health Professions Development, Pennsylvania Department of Health   |
| David Ranck, MEd, RN                    | President, TLC Inc. and Healthcare Coordinator, South Central Workforce Investment Board  |
| Leland "Rocky" Rockstraw, MSN, MSA, RNA | Assistant Professor and Director, Center for Clinical and Electronic Learning Research, Drexel University College of Nursing and Health Professions                             |
| Donna Ayers Snelson                     | Chairperson and Associate Professor, College Misericordia Department of Nursing   |
| Carolyn Voorhees                        | Director of Practical Nursing, Lancaster County Career and Technology Center  |
| Beverly L. Welhan, Ph.D.                | Director and Professor, Nursing Program, Montgomery County Community College  |
| Susan Wesmiller, MSN, RN                | Director of Nursing Education and Research, UPMC Presbyterian and UPMC Shadyside  |
| Kathryn M. Yecko, RN, MSN               | Director, The Washington Hospital School of Nursing   |

**Additional Contributors**

| <b>Name</b>                 | <b>Title/Organization</b>   |
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| K. Stephen Anderson         | Director, School of Anesthesia, Hamot Medical Center Gannon University and Pennsylvania State Board of Nursing  |
| Michelle Campbell, MSN, RNC | Former Executive Director, Pennsylvania State Nurses Association  |
| Michelle Doas, Ph.D.        | Associate Dean of Nursing, Community College of Allegheny College   |
| John O'Donnell, CRNA, MSN   | Associate Director, Nursing Programs, Peter M. Winter Institute for Simulation, Education and Research (WISER), University of Pittsburgh Medical Center and Director and Instructor, Nurse Anesthesia Program, Department of Acute/Tertiary Care, School of Nursing, University of Pittsburgh |
| Mary Grace Simcox, Ph.D.    | President, Lancaster General College of Nursing and Health Sciences   |
| Jim Veronesi, MSN, RN       | Board President-elect, Pennsylvania Organization of Nurse Leaders   |

**Staff**

| <b>Name</b>   | <b>Title/Organization</b>   |
|---------------|---|
| Mary Marshall | Director for Planning and Research, PA Workforce Investment Board, Pennsylvania Center for Health Careers |
| Kelly Glass   | The Hill Group, Inc.  |