

American Association of Colleges of Nursing



### Funding Nursing Education in the Economic Stimulus Package: Proposal Details

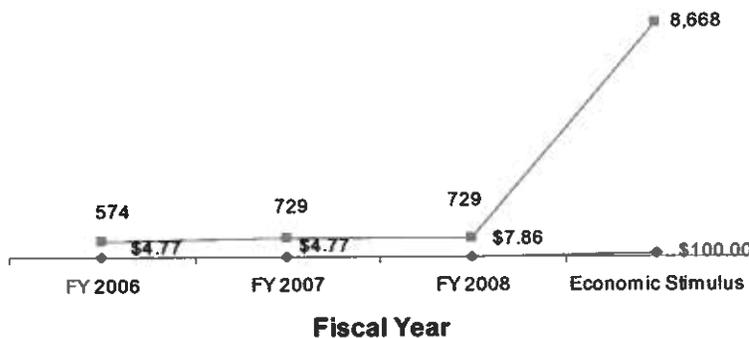
The American Association of Colleges of Nursing (AACN) respectfully requests Congress to include \$500 million for specific Title VIII Nursing Workforce Development Programs, authorized under the Public Health Service Act, in the economic stimulus package to bolster the nursing workforce and reverse the shortage. The stimulus package represents a timely opportunity to solve the long-standing workforce shortage, which has been complicated by capacity barriers in the nursing educational system.

#### *1. AACN respectfully request \$100 million for the Nurse Faculty Loan Program (NFLP) (Sec. 846A).*

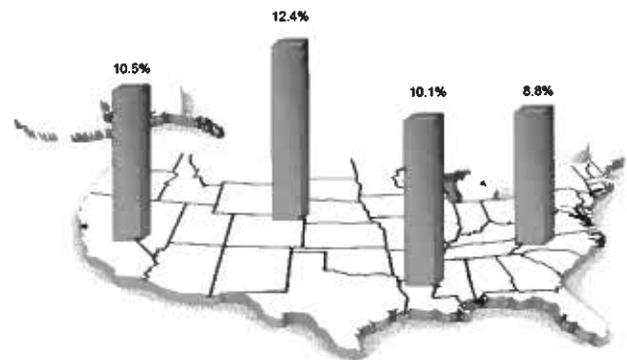
Officials from the Health Resources and Services Administration (HRSA) have stated that to meet the projected demand in nursing, the U.S. must graduate approximately 90 percent more nurses than the number graduating today. According to AACN, the number one reason cited by schools of nursing for being unable to increase student capacity and meet the projected demand is the nurse faculty shortage. Given the current evidence—nurse faculty vacancy rates (as high as 12.4% in the mid-west), insignificant increases in graduation rates from graduate programs, and limited budgets in nursing schools to hire more faculty—NFLP should receive \$100 million in the economic stimulus package.

Based on the funding level and the number of students supported in FY 2008, plus the average tuition increase rate of 7%, potentially 8,668 future nurse faculty could be supported if this program were to receive \$100 million. Out of the 68,384 students currently enrolled in graduate nursing programs, a funding level of \$100 million could support 12.7% of this population, a percentage that could meet the current vacancy rates.

*Projected number of students supported by \$100 million for the NFLP in the economic stimulus package.*



*Vacancy Rate by Region in Schools Reporting Vacancies for Academic Year 2008-2009*



—●— Funding Level (in millions) —■— Number of Students Supported

FY funding levels and number of students supported was provided by the Division of Nursing, HRSA. Projections based on the funding level and the number of students supported in FY 2008, plus the average tuition increase.

From: American Association of Colleges of Nursing (2008, July). Member Survey on Vacant Faculty Positions for Academic Year 2008-2009. Washington, DC.

#### *2. AACN respectfully request \$200 million for the Advanced Education Nursing (AEN) Program (Sec. 811) to be divided equally among the AEN Grant Program and Traineeship Programs (AEN Traineeships and Nurse Anesthetist Traineeships).*

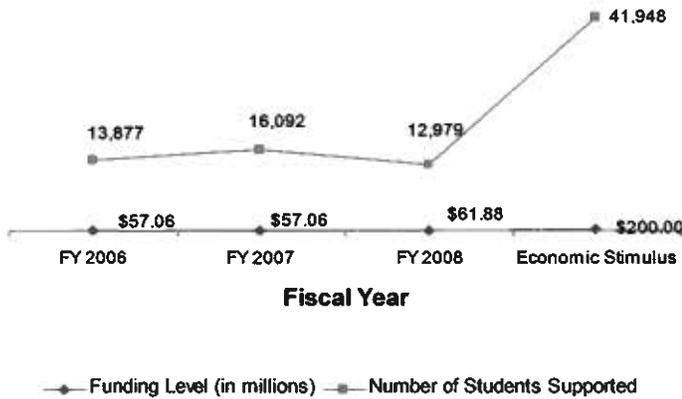
According to AACN's annual survey, U.S. nursing schools turned away 40,285 qualified applicants from baccalaureate and graduate nursing programs in 2007 due to insufficient numbers of faculty, clinical sites, classroom space, clinical preceptors, and budget constraints. Many of these barriers could be addressed through bolstering funding for Advanced Education Nursing Grants under the AEN Program. This grant program provides funding to support graduate nursing programs that educate future nurse faculty and nurse practitioners, a reliable source of primary care providers. Additionally, the Traineeships under the AEN Program help to address two



critical shortages: nurse faculty and primary care providers who are advanced practice registered nurses (nurse practitioners, clinical nurse specialists, nurse anesthetists, and nurse midwives).

Based on the funding level and the number of students supported in FY 2008, plus the average tuition increase rate of 7%, a total of 41,948 future primary care providers and nurse faculty could be supported if \$200 million was provided to the AEN Program (divided equally among the grants and traineeship programs).

*Projected number of students supported by \$200 million for the Advanced Education Nursing Program in the economic stimulus package.*



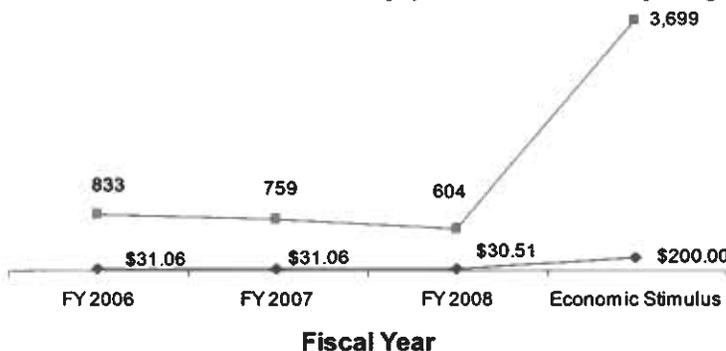
FY funding levels and number of students supported was provided by the Division of Nursing, HRSA. Projections based on the funding level and the number of students supported in FY 2008, plus the average tuition increase.

**3. AACN respectfully requests \$200 million for the Nurse Loan Repayment and Scholarship Program (Sec. 846) to be divided equally among the Loan Repayment and Scholarships sections of the program.**

The federal government can support aspiring nurses by providing them with the opportunity to secure positions in a high-growth profession and help to stabilize the economy. In FY 2008, the Nurse Loan Repayment and Scholarship Program (which includes two sections: a loan repayment and a scholarship provision), received \$31.51 million. For FY 2008, a total of 5,875 applications were received for the loan repayment section, and 3,039 applications were received for the scholarship section. However, neither section of the program had sufficient funds to meet the demands of nursing students seeking support. While all 5,875 applications to the loan repayment section were reviewed, only 435 students were supported—a meager 7.4% of the total applications received. The students who applied to the scholarship section of the program faced similar disappointment. Of the 3,039 applications received, 334 were reviewed, and only 169 were funded—a mere 5.6% of the total applications received.

The students who applied for the Nurse Loan Repayment and Scholarship Program are individuals who are enrolled or accepted for enrollment in schools of nursing. They are not affected by the nurse faculty shortage because they are already in schools of nursing. The federal government has the opportunity to ensure that these nursing students continue their education, meet the healthcare needs of the nation, and help stimulate the economy. Based on the funding level and the number of students supported in FY 2008, plus the average tuition increase rate of 7%, the federal government could provide support to nearly 4,000 nursing students if both sections of the Nurse Loan Repayment and Scholarship Program received a total of \$200 million.

*Projected number of students supported by \$200 million for the Nurse Loan Repayment and Scholarship Program in the economic stimulus package.*



FY funding levels and number of students supported was provided by the Division of Nursing, HRSA. Projections based on the funding level and the number of students supported in FY 2008, plus the average tuition increase.



# Nursing Workforce Development Programs

*Supporting the Next Generation of Nurses and the Faculty Who Educate Them*



EDUCATION

RECRUITMENT

RETENTION

The *American Association of Colleges of Nursing* (AACN) is the national voice for baccalaureate and graduate nursing education. AACN represents over 630 schools of nursing that educate approximately 260,000 students annually and employ over 13,000 faculty members. Together, these institutions produce about half of our nation's registered nurses and all of the nurse faculty and researchers.



# The Nursing Shortage: Healthcare's Crisis

## The Facts

### Healthcare Delivery System

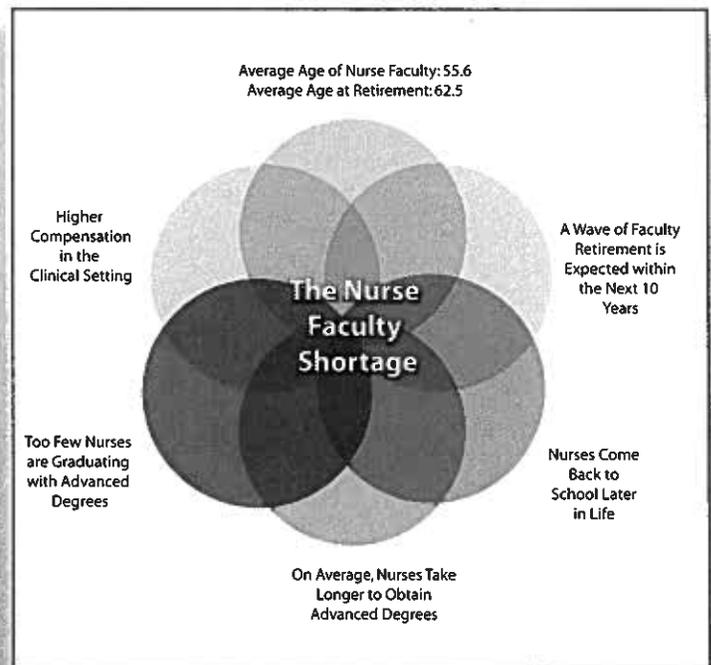
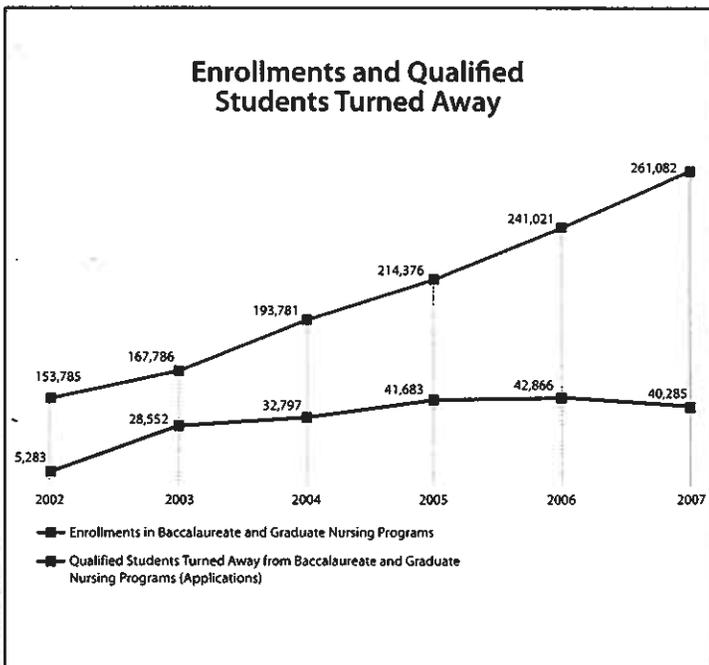
- In November 2004, The National Survey on Consumers' Experience with Patient Safety and Quality found that 40% of Americans think the quality of health care has worsened in the last five years. Consumers reported that the most important issues affecting medical error rates are **workload, stress or fatigue among health professionals (74%)**; too little time spent with patients (70%); and **too few nurses (69%)**. This survey was sponsored by the Kaiser Family Foundation, the Agency for Healthcare Research and Quality, and the Harvard School of Public Health.
- A paramount reason for compromised patient safety is the critical shortage of Registered Nurses (RN) in the United States. The Joint Commission found that for **roughly a quarter (24%) of hospital patient deaths and injuries**, low nurse staffing levels was a contributing factor.

### The Nursing Shortage

- Since 1998, the United States has experienced a significant shortage of RNs, which has dramatically impacted the quality of care provided by our nation's healthcare delivery system. This shortage is expected to intensify as the **baby boomer population ages, medical technology advances, and the need for health care grows**.
- According to a report released by the American Hospital Association in July 2007, U.S. hospitals need approximately **116,000 RNs to fill vacant positions nationwide**.
- The Health Resources and Services Administration (HRSA) projects that **the nation's nursing shortage will grow to more than one million nurses by the year 2020**. Unless we act now, these shortages will increase over the next twelve years, further jeopardizing access to quality patient care.

## Uncovering the Root Cause: The Nurse Faculty Shortage

The nursing shortage can no longer be explained by the need to simply increase the number of nurses in the workforce since a parallel shortage of nurse faculty further complicates the problem. According to an AACN survey conducted in 2007, **schools of nursing turned away 40,285 qualified applicants to baccalaureate and graduate nursing programs**. The top reason cited by schools for not accepting these potential students was a lack of qualified nurse faculty. This element of the shortage has created a negative chain reaction—without more nurse faculty, additional nurses cannot be educated; and without more nurses, the shortage will continue. Ultimately, the shortage of nurses and nurse faculty will continue to endanger an already stressed healthcare system.



SOURCE: American Association of Colleges of Nursing, Research and Data Center, 2007. AACN is not responsible for errors in reporting by respondent institutions.

A number of contributing factors inhibit schools of nursing from attracting and retaining nurse faculty, ultimately stifling student and nursing workforce growth capacity.



# Nursing Workforce Development Programs: A Proven Solution

Nursing Workforce Development programs, authorized under Title VIII of the Public Health Service Act (42 U.S.C. 296 et seq.), have supported the supply and distribution of qualified nurses to meet our nation's health care needs since 1964. **Title VIII programs provide the largest source of federal funding for nursing education**, offering financial support for nursing schools, individual students, and practicing nurses.

- These programs bolster nursing education from entry-level preparation through graduate study.
- Title VIII programs favor institutions that educate nurses for practice in **rural and medically underserved communities**.

## Title VIII Program Basics

**Advanced Education Nursing (AEN) Grants (Sec. 811)** support programs that prepare graduate-level nurses to be primary care providers and nurse faculty. These grants help schools of nursing, academic health centers, and other non-profit entities improve the education and practice of nurse practitioners, nurse-midwives, nurse anesthetists, and nurse educators, among others. In FY 2007, AEN grants supported the graduate education of 5,978 nurses.

- **AEN Traineeships** assist graduate nursing students by providing full or partial support for the costs of tuition, books, program fees, and reasonable living expenses. In FY 2007, 99% of the applications were approved, which supported 7,941 students. Funding for the AEN Traineeships support the education of future nurse faculty and nurse practitioners who provide primary care to thousands of Americans.
- **Nurse Anesthetist Traineeships (NAT)** support the education of students in nurse anesthetist programs. Much like the AEN Traineeships, the NAT provide full or partial support for the costs of tuition, books, program fees, and reasonable living expenses. In FY 2007, 100% of the applications were approved, which supported 2,173 students.

**Workforce Diversity Grants (Sec. 821)** prepare students from disadvantaged backgrounds to become nurses. This program awards grants and contract opportunities to schools of nursing, nurse-managed health centers, academic health centers, state or local governments, and nonprofit entities looking to increase access to nursing education for disadvantaged students, including racial and ethnic minorities under-represented among RNs. In FY 2007, these grants supported 32,847 students.

**Nurse Education, Practice, and Retention Grants (Sec. 831)** help schools of nursing, academic health centers, nurse-managed health centers, state and local governments, and health care facilities strengthen programs that provide nursing education. Over 20,000 nurses and nursing students were supported in FY 2007.

**Nursing Student Loan (NSL) Program (Sec. 835)** was established in 1964 to address nursing workforce shortages. The revolving fund provides each accepted nursing student, under-

*In FY 2007, Title VIII programs provided loans, scholarships, and programmatic support to 71,729 nursing students and nurses.*

graduate or graduate, a maximum of \$13,000 at 5% interest with a preference for those in financial need. The repayment period is 10 years. The NSL program may provide \$2,500 in non-taxable loans to nursing students during each of their first two years of study and \$4,000 for their last two years. Funds are loaned out to new students as existing loans are repaid. **This program has not received additional appropriations since 1983.**

**Nurse Loan Repayment and Scholarship Programs (Sec. 846)** support current students and new graduates:

- **Loan Repayment:** Repays up to 85% of nursing student loans in return for at least three years of practice in a designated healthcare facility. While 4,494 applications were reviewed, only 13% were funded in FY 2007 supporting 586 students.
- **Scholarship:** Offers individuals who are enrolled or accepted for enrollment as full-time nursing students the opportunity to apply for scholarship funds. Upon graduation, a nurse is required to work in a health care facility with a critical shortage of nurses for at least two years. One-hundred and seventy-three students were supported in FY 2007.

**Nurse Faculty Loan Program (Sec. 846A)** increase the number of qualified nurse faculty by creating a student loan fund within individual schools of nursing. Students must agree to teach at a school of nursing in exchange for cancellation of up to 85% of their educational loans, plus interest, over a four-year period. In FY 2007, these grants supported the education of 729 future nurse educators.

State	FY 2005
Alabama	4,016,497
Alaska	192,398
Arizona	2,972,531
Arkansas	714,938
California	7,645,103
Colorado	1,042,480
Connecticut	467,013
Delaware	122,430
District of Columbia	2,426,033
Florida	3,123,354
Georgia	3,037,331
Hawaii	1,098,511
Idaho	261,633
Illinois	6,021,975
Indiana	980,812
Iowa	297,564
Kansas	609,537
Kentucky	2,194,324
Louisiana	1,098,012
Maine	372,102
Maryland	1,757,231
Massachusetts	2,678,178
Michigan	2,355,510
Minnesota	1,167,390
Mississippi	446,927
Missouri	1,728,183

SOURCE: Division of Nursing, HRSA



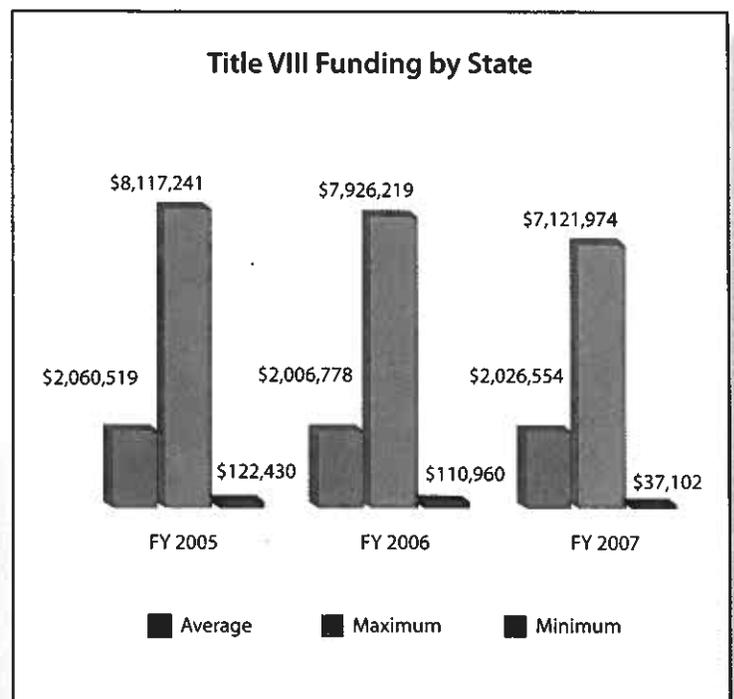
FY 2006	FY 2005- FY 2006	FY 2007	FY 2006- FY 2007	State	FY 2005	FY 2006	FY 2005- FY 2006	FY 2007	FY 2006- FY 2007
6,170,161	2,153,664	7,043,777	873,616	Montana	603,751	687,963	84,212	1,309,439	621,476
848,247	655,849	920,168	71,921	Nebraska	722,986	545,333	-177,653	484,596	-60,737
3,029,009	56,478	2,271,634	-757,375	Nevada	130,989	110,960	-20,029	538,852	427,892
650,833	-64,105	421,546	-229,287	New Hampshire	186,901	394,248	207,347	196,008	-198,240
6,155,085	-1,490,018	5,625,360	-529,725	New Jersey	2,662,135	3,365,289	703,154	2,845,610	-519,679
754,085	-288,395	1,392,093	638,008	New Mexico	990,153	1,307,700	317,547	499,043	-808,657
609,256	142,243	632,719	23,463	New York	8,117,241	7,926,219	-191,022	7,121,974	-804,245
156,002	33,572	128,825	-27,177	North Carolina	4,217,127	4,066,407	-150,720	4,303,885	237,478
2,227,714	-198,319	1,671,344	-556,370	North Dakota	765,449	578,558	-186,891	1,135,682	557,124
3,167,875	44,521	3,376,530	208,655	Ohio	4,039,938	2,981,422	-1,058,516	2,339,535	-641,887
3,031,007	-6,324	3,563,585	532,578	Oklahoma	1,669,865	775,697	-894,168	934,925	159,228
1,472,208	373,697	1,745,625	273,417	Oregon	2,411,481	1,017,631	-1,393,850	1,541,084	523,453
270,751	9,118	37,102	-233,649	Pennsylvania	3,017,212	3,579,973	562,761	4,049,292	469,319
4,573,177	-1,448,798	4,632,555	59,378	Puerto Rico	703,605	1,372,451	668,846	1,346,934	-25,517
1,738,795	757,983	1,513,457	-225,338	Rhode Island	303,127	310,974	7,847	305,517	-5,457
334,230	36,666	337,078	2,848	South Carolina	1,969,130	1,807,631	-161,499	2,375,864	568,233
612,850	3,313	748,901	136,051	South Dakota	693,308	1,103,368	410,060	1,039,612	-63,756
1,149,999	-1,044,325	1,284,673	134,674	Tennessee	3,466,112	6,112,434	2,646,322	4,810,024	-1,302,410
1,055,180	-42,832	893,973	-161,207	Texas	7,957,042	5,882,682	-2,074,360	5,482,205	-400,477
115,186	-256,916	95,766	-19,420	Utah	989,912	1,308,148	318,236	1,122,802	-185,346
1,406,320	-350,911	2,532,055	1,125,735	Vermont	513,678	213,622	-300,056	212,974	-648
2,673,130	-5,048	3,642,186	969,056	Virginia	4,559,652	3,101,467	-1,458,185	1,831,125	-1,270,342
2,825,265	469,755	3,791,804	966,539	Washington	4,465,131	4,182,002	-283,129	4,286,494	104,492
1,254,473	87,083	1,059,336	-195,137	West Virginia	519,686	536,197	16,511	266,163	-270,034
1,392,204	945,277	1,917,105	524,901	Wisconsin	2,117,314	1,697,590	-419,724	2,244,526	546,936
1,257,186	-470,997	960,700	-296,486	Wyoming	526,072	456,248	-69,824	516,771	60,523

	FY 2005	FY 2006	FY 2005- FY 2006	FY 2007	FY 2006- FY 2007
<b>Total</b>	\$107,146,994	\$104,352,442	-\$2,794,552	\$105,380,833	\$1,028,391

**Comprehensive Geriatric Education Grants (Sec. 855)** may be used to educate RNs who will provide direct care to older Americans, develop and disseminate geriatric curriculum, educate faculty members, and provide continuing education.

Between FY 2005-FY 2006, 54% of the states experienced a decrease in Title VIII funding and 46% saw a decline in funding between FY 2006-2007. During FY 2006, these states lost, on average, \$537,282 and \$425,591 in FY 2007. AACN certainly understands the difficult fiscal choices Congress must make regarding funding for health and education programs. Therefore, AACN's member schools and students are extremely grateful for the funding they do receive. Yet at a time when the national nursing shortage is placing a constant strain on the healthcare delivery system, Congress must invest more in the present and future nursing workforce to prevent further damage.

For decades, Title VIII programs have offered viable solutions to nursing shortages, expanded nursing school programs, increased the number of nurse faculty, and helped ensure nurses were practicing in areas with a critical shortage. Continued and increased funding for these programs is essential and does make a difference in the lives of nursing students.





*My hopes are that by becoming a professor I can assist in altering the experiences of other African American males already admitted in the nursing profession. Being the only African American male in my growth as a nurse and never encountering African American professors in nursing, there seems to be a drastic*

*need for increased ethnic representation in nursing academia. Students need mentors with whom they can identify, so they can have a role model and visualize themselves in their mentor's position. In the hospital setting, ethnic and cultural diversity is expanding within the patient population, as well as in nursing staff that provide care. The pools of ethnicity are growing in nursing programs, thus I feel nurse educators must emulate the populations they represent. Federal financial aid, through Nursing Workforce Development programs, is of value to helping ascertain this goal.*

~ Erik V. Carter  
University of California, San Francisco  
Master of Science in Nursing Student,  
Nurse Loan Repayment and  
Scholarship Recipient



*The last 14 years of my life involved a lot of financial hardship for me and my family. I've grown up in a broken home, with a single mother, who has done everything she could to give her children a happy home as well as an excellent education. Life for me has not been easy, financially,*

*and so college wasn't even an option in my mind when I was in high school. I never thought I would be able to afford an education. As I was told about financial aid and government grants and scholarships, college finally became an option for me. If it wasn't for the help of the Nursing Student Loan program I have received these past four years, I'm not really sure where I would be right now. Nursing is an incredibly rewarding profession that gives so much time and compassion to help others. I really hope Congress continues to help and to allow more funding so that better quality of care can be given by nursing students who want so badly to be nurses.*

~ Rebecca L. Bicking  
Misericordia University, Pennsylvania  
Bachelor of Science in Nursing Student,  
Nursing Student Loan Recipient



*Pursuing my dream to become an Advanced Practice Nurse has been a wonderful, yet costly endeavor. I am a full-time graduate student, and mother of two sons ages one and two. My loans for this degree will leave me with a debt of over \$90,000, in addition to the undergraduate RN loans I am still paying*

*off. Childcare, housing, medical expenses, and tuition far exceed the amount I can obtain in loans. It's a small fraction of the overall cost to obtain my degree, but it has certainly made a difference in our lives. I am truly thankful.*

~ Brandy Mitchell  
University of Washington  
Master in Nursing Student,  
Advanced Education Nursing  
Grant Recipient



*The federal aid was truly a blessing. The funds allowed me to work part-time while raising a family. I was able to excel in the family nurse practitioner program. My goals were attained, and after I receive certification, I will be employed at Glen Oaks High School which is in an underserved area in*

*East Baton Rouge Parish, Baton Rouge, LA. I also have future plans to teach part-time in a nurse practitioner program. I really don't think I would have done so well in the program without the funding. It was greatly appreciated.*

~ Laura Jones  
University of South Alabama  
Master of Science in Nursing Student,  
Advanced Education Nursing  
Traineeship Recipient



## Center to Champion Nursing in America

The *Center to Champion Nursing in America*— a joint initiative of AARP, the AARP Foundation and the Robert Wood Johnson Foundation—is addressing the growing nurse and nursing faculty shortage that threatens access to health care and quality of care across our nation. A consumer-driven, national force for change, the Center seeks to ensure that our country has the nurses it needs to care for all of us, now and in the future. The Center focuses on two main priorities: our nation's capacity to educate and retain nurses.

The Center is spearheading the formation of a diverse national coalition, the *Champion Nursing Coalition*, representing the voices of consumers, purchasers and providers of health care to support solutions to the nursing shortage. Its purpose is to first raise awareness about the shortage and then to achieve permanent solutions to this looming health care crisis.

### Addressing the Nursing Shortage

Specifically, the *Center to Champion Nursing in America* will pursue partnerships, policies and activities that:

- At the state and national level, *seek funding to support expanded nursing education* programs and prepare more nursing faculty to assume teaching roles.
- *Build a diverse coalition* of nursing leaders, education and health care organizations, business leaders, and policy makers to devise a comprehensive strategy for bringing more nursing faculty into the pipeline and using the powerful voice of consumers to advocate for the resources to solve the nursing faculty shortage.
- Boost nurse job satisfaction and retention by seeking ways to *increase the involvement of nurses in decision making* about care delivery and management. This will include creating more prominent roles for nursing leaders, such as on the governing boards of hospitals and other health care institutions to provide a critically-needed perspective on improving safety and quality of care for patients.
- *Increase the number of nurses remaining in the workforce* past traditional retirement age.
- *Decrease turnover among new nursing graduates* by increasing the number of nurse residencies to ensure a formal transition to practice.

### Working for Change

The Center will use multiple strategies to create positive change. These include:

- **Building coalitions.** The Center is spearheading the development of multi-disciplinary health care, business and consumer coalitions at both the state and national level. These coalitions will explore ideas for addressing the nursing shortage and educate and advocate for effective programs and policies.



- **Co-hosting national summits.** The Center is collaborating with the U.S. Department of Labor and other partners to design and implement national summits on increasing nursing education capacity and nurse retention.
- **Ongoing technical assistance.** The Center is providing continuing technical assistance to at least 15 geographically diverse states (building to 30 states by the end of 2009) through at least one onsite visit and the use of interactive Web-based communications.
- **Developing a clearinghouse.** The Center is gathering the information and research that will help drive action and will develop a Web-based information clearinghouse for public reference.
- **Supporting state and grassroots efforts.** The Center is building public education and advocacy initiatives at AARP state offices nationwide and will provide advocacy training, communications support and assistance to stakeholders to help them communicate more effectively with policy-makers and private-sector leaders.

## Center Leadership

### *Brenda L. Cleary, Ph.D., R.N., F.A.A.N., Director*

Dr. Cleary is a national expert on health care workforce research and policy. For 14 years, prior to joining AARP to direct the Center to Champion Nursing in America, Cleary was the executive director of the North Carolina Center for Nursing. She provides leadership and expertise to a number of nursing and health care organizations, including the American Nurses Association, the American Academy of Nursing, and the Forum on State Nursing Workforce Centers, among others. Dr. Cleary received a B.S.N. and M.S.N. from Indiana University and a Ph.D. in Nursing from The University of Texas at Austin.

### *Susan C. Reinhard, Ph.D., R.N., F.A.A.N., Chief Strategist*

Dr. Reinhard, a senior vice president at AARP, directs its Public Policy Institute. She is a nationally-recognized expert in nursing and health policy. Prior to her work at AARP, Reinhard served as a professor and co-director of the Rutgers Center for State Health Policy where she directed several national initiatives to improve care for people with disabilities, long-term care, and care received by older adults. She holds a master's degree in nursing from the University of Cincinnati and a Ph.D. in sociology from Rutgers, The State University of New Jersey.



# Smart Technology, Enduring Solutions

## Technology Solutions Can Make Nursing Care Safer and More Efficient

By Linda Burnes Bolton, DrPH, RN, FAAN; Carole A. Gassert, PhD, RN, FACMI, FAAN; and Pamela F. Cipriano, PhD, RN, FAAN

### KEYWORDS

Technology, smart technology, CPOE, clinical information systems, interoperability, point-of-care devices, safety, workflow, waste.

### ABSTRACT

The shortage of registered nurses in hospitals threatens to cripple healthcare delivery in the next three to five years. The demand for nursing care has increased while the willingness of nurses to stay at the bedside in acute-care settings has decreased. The American Academy of Nursing Workforce Commission developed and tested a process called Technology Drill Down in more than 200 medical-surgical patient care units in a study supported by The Robert Wood Johnson Foundation. The process identified workflow inefficiencies that could be addressed through the deployment of technology. Findings from the study indicate the need for smart, portable, point-of-care solutions that are interoperable across devices and systems. Nurses believe that technology can reduce waste and workflow inefficiency and enable nurses to provide safe, reliable, quality patient care.

Over the past two decades healthcare organizations, professional associations and the Institute of Medicine have warned the American public that failure to improve the practice environment for nurses and other health professionals would threaten our ability to provide safe, quality and effective patient care.<sup>1,2,3</sup> The basis for these profound observations was the increasing complexity of acute-care environments, the increasing demand for nursing care, the aging of the American workforce and the lack of data on what work areas require improvement. In 2002, the American Academy of Nursing launched an investigation supported by The Robert Wood Johnson Foundation to identify practice environment and workflow practices that result in workflow inefficiencies, nursing dissatisfaction and turnover and ultimately affect the nurse's ability to meet the demand for safe, quality patient care.

### BACKGROUND

The presence of nurses at the bedside is critical to the early identification of changes in patient conditions and the implementation



of evidenced based interventions to prevent patient harm. Nurses are essential to preventing harm to patients as documented by multiple research projects. A medication study over a six-month period determined that nurses intercepted 86 percent of potential medication errors. However, estimates of the amount of nurses' time spent in direct patient care range from 23 percent to 30 percent. Multiple factors pull nurses away from their patients, including documentation of assessments, interventions and patient response to treatment; being ready and waiting for information, supplies, equipment, medications or assistance from other team members; hunting and gathering items to provide care; traveling to and from central stations and medication rooms; and communicating with physicians and other members of the patient care team. Chaotic and complex inefficient environments contribute to nursing dissatisfaction, nursing staff turnover and diminished capacity to provide quality care.<sup>1,2,3,4,5,6</sup> Flawed workflows result in inefficient use of personnel, delays in care, and compromise of patient safety and privacy.<sup>7</sup>

Most efforts to address the demand for nursing care have been targeted at increasing the supply of nurses. A surge in applicants to nursing schools has occurred, but the production capacity of America's nursing schools has been limited due to the shrinking numbers of nursing school faculty. In 2007, 145,000 qualified nursing school applicants were turned away due to the lack of capacity.<sup>8</sup> Though more nurses are being produced, even more nurses are retiring or leaving direct patient care positions.

The aging American workforce represents a serious threat to the nation's ability to provide safe care for its populace. The average age of registered nurses is 48 with a staggering one and a half million eligible for retirement over the next five years. That represents 47 percent of the current workforce. In acute-care hospitals almost half of the workforce is age 50. The number of nurses working in acute-care settings has actually declined despite the increase in the number of licensed registered nurses in the United States from 2002 to 2004.<sup>9</sup> Staff nurses increasingly cite their disappointment with their work environments and the inability to provide as much patient care as they would prefer as contributing factors to their intent to leave their job and the profession.<sup>5</sup> Nurses demand changes in their practice environment to stay at the bedside. Along with their co-workers and patients, they also expect technologically advanced care. Healthcare leaders must ensure manageable workloads and provide the resources required for safe and effective care.<sup>7</sup>

The American Academy of Nursing (Academy) Technology Drill Down (TD2) research identified work environment factors that could be improved with the deployment of technology. Nurses and other patient care team members espoused a more efficient work environment that not only reduces waste, but also improves working conditions and the care they provide.

## METHODOLOGY

The Academy engaged twenty five acute-care hospitals across the country including facilities participating in the Transforming Care at the Bedside (TCAB) initiative. Hospitals varied in size with 28

percent under 250 beds, 36 percent from 251 to 500 beds, and 36 percent greater than 500 beds. The majority were urban with only 20 percent suburban and 8 percent rural. All were not-for-profit, with 39 percent academic, 39 percent community owned, 18 percent private and 4 percent government. Seventy-two percent were teaching facilities and 44 percent were recognized as Magnet hospitals.

More than 200 patient care units representing more than 1,000 individuals participated in the two-day program. Each hospital

## Nurses believe it is essential to have smart, portable, point-of-care solutions for capturing and transmitting data, as well as routine communication.

identified representatives to participate in a mapping exercise targeted to identify current workflow practices, envision idealized workflow patterns and recommend technology solutions to close the gap between current and ideal workflow practices. Representatives included registered nurses, pharmacists, information technology specialists, assistive personnel, unit clerks, therapists (respiratory, physical, occupational), social workers, pharmacists, clinical engineers, dieticians, materials management, environmental services, administrators and managers and, at some facilities, patients.

On Day 1, the participants reviewed their typical day, identifying normal workflow practices. They also described their current and ideal work environment. On Day 2, the teams selected the top workflow areas of concern, and engaged in "deep dives" to envision work environments that are enhanced through technology. The TD2 process unmasked workflow inefficiencies and impaired work environments. Participants worked in groups to prioritize the workflow practice improvements and recommend technology solutions.

## FINDINGS

Nurses and colleagues across the country identified 327 workflow issues with 766 unique process issues that are part of the nurse's care delivery in medical-surgical units. When analyzed, these represented eight major workflow categories of concern: admission, discharge and transfer (ADT); care coordination; care delivery; communication; documentation; medication; patient movement; and supplies and equipment.

Each of these workflows can benefit from using technology. Nurses consistently emphasized the need for improved safety, desire for standardization of processes, and system integration. For example, an efficient clinical information system (CIS) with an easy-to-use interface, integrated with all other systems and departments in the institution would expedite the ADT process. Patients could initially enter their own information concerning reason for admission and medical history during the ADT process. Their smart cards or personal health chips could be scanned to begin to populate the CIS. Summaries from previous admissions would be obtained and available for review. Information obtained during the ADT process could automatically trigger a bed assignment and notify providers of the patient's arrival, impacting both the patient movement and communication workflows.

Information captured would begin the documentation process

**Table 1: Categories of technology solutions.**

IS	785
Device	569
Hardware	167
Telecommunication	16
Tool	8
Software	4
Non-tech/Non-InfoTech	42

and impact this workflow. Since systems would be integrated, documentation could occur at each point where care is rendered, increasing efficiency and reducing costs, and increasing safety of care. Bedside entry systems could interface to medication systems, supply systems, and equipment systems to trigger ordering, charging and instructions as the patient is examined and orders are entered at the bedside. Robotic systems can be used to deliver needed supplies and equipment to the bedside and deliver collected specimens to the laboratory. Thus the workflows of medications and supplies and equipment are also impacted by the technology. Needed tests would automatically enter into a centralized

patients and giving them needed time to counsel patients about medications and interventions included in their care.

### TECHNOLOGY SOLUTIONS

In the TD2 study, nurses and colleagues identified 599 unique statements in the total of 1,591 technology solutions statements they felt would assist with safe and efficient patient care. In coding the statements the reviewers indicated if the statement pointed to an overall category of technology, if it indicated a specific type of technology, up to two descriptors or technology requirements denoted, and up to two functions the technology would address. Some statements named specific types of technology solutions, e.g., RFID technology for tracking equipment, others described desired features or technology requirements, e.g., voice communication device. When examining the overall category of technology, 785 statements indicated a need for an information system and more than 500 statements designated the need for a technology device to facilitate workflow. (See Table 1.) An additional 167 statements pointed to the availability of hardware in the practice environments. Sixteen statements pointed to the need for telecommunication technology.

When examining the specific type of technology indicated in the statement, the most frequent was bedside technology, followed closely by an electronic medical record (including clinical information system), and CPOE. The remaining list of specific types of technology named by study participants is as follows in descending order of frequency: tracking, barcoding, robot, RFID,

MAR, PDA, smart bed, smart pump, wireless on wheels, laptop/tablet, smart card, tube system, kiosk, decision support, GPS, camera and data warehouse. (See Table 2.)

Nurses brainstormed functionalities that make technology faster, more convenient, compact, and easier to use. The need for interoperability and integration topped the list of functionalities followed by strong preferences for hands free features (voice activation) and portability (hand-held) for devices requiring user interface. (See Table 3.)

Technology use has become more common in healthcare but has not been adopted in a way that reaches its fullest potential of use. Technology should be ubiquitous in nursing practice and if applied appropriately can transform clinical care. Clinical transformation is defined as clinical

**Table 2: Specific types of technology. (Descending frequency)**

Bedside	130	Smart pump	15
CPOE	94	WOW	14
EMR (CIS)	92	Smart card	13
Tracking	76	Kiosk	6
Barcoding	69	Pyxis	5
Robot	38	Laptop/tablet	5
RFID	33	Decision support	3
PDA	32	Camera	3
Tube system	30	Data warehouse	2
MAR	25	GPS	2
Smart bed	19		

scheduling system to positively impact the workflow of care coordination and communication.

One of the biggest problems identified by nurses is the availability of needed hardware to successfully complete their work list. Nurses walk miles during their shift finding equipment and supplies. RFID technology and robots could impact their care delivery tremendously. Improving this workflow would allow nurses more time for communicating discharge instructions with

cal and non-clinical process improvement that is supported by technology. Technology must be seen as supporting and not driving the processes of care and improvement to reach the desired outcomes.

The technologies nurses envisioned reflect a broad range of functions touching every aspect of workflow and care. Nurses believe technology can greatly reduce the burden associated with the workflows of documentation, medication administration,

**Table 3: Technology solution requirements.**

Integrated	211	Translation	34
Voice-activated	133	Wireless	30
Handheld	84	Portable/mobile	25
Smart	41	Notification	19
Automatic/auto pop	39	Hands free	19
Biometric	37	Interactive	16
Touch screen	37	Centralized	16

communication, orders, and securing equipment and supplies. Many devices and technology applied at the point of care can also be multifunction. Technology solutions can and should improve a variety of functions of work that complement hands-on care. (See Table 4.)

Most often individuals think of information systems, clinical information systems in particular, when technology is discussed. It is true that healthcare is an information intensive industry. In 2004, President Bush called for widespread adoption of interoperable electronic health records within 10 years. Today, only about one fourth of hospitals have comprehensive information systems in place. Nurses report that existing systems are often splintered, unable to interface and require multiple log-on to access or enter data. They call repeatedly for integrated systems to ease their workload and help them reach clinical transformation. In addition they want access to these integrated systems from the point of care, most often at the bedside. Some clinical information systems still use clumsy, word based interfaces rather than graphical user interfaces that save time and are more easily learned. It is time to develop systems that reduce the workload rather than requiring providers, nurses in particular, to develop a work around to use the clinical information system to support their practice.

Information systems are a crucial technology but only one kind of technology that can bring about clinical transformation.<sup>10</sup> Another type of technology is biomedical monitoring systems including noninvasive blood pressure devices or wireless telemetry monitors used in acute care and even home care settings. Biomedical systems can increase patient privacy and confidentiality by using physiological scans such as retinal images or fingerprinting to authorize care providers to have access to patient data. This technology eliminates the need for remembering passwords and should stop the practice of taping passwords to keyboards or monitors in case they are forgotten. Wireless communication and connectivity technologies allow the care team to communicate readily at the point of care, avoiding unnecessary travel to a facility or walking within a facility that delays implementation of critical interventions while receiving expert consultation from a distance.

An additional class of technologies are instrumental in improving patient safety. These technologies imbed computer chips that gather information and respond within a range of preset parameters. Known as smart technology, because it performs a task we think an intelligent person can do, it includes smart IV pumps, smart beds, and smart cards. Smart beds are able to monitor patients' vital signs and mobility without using electrodes. Smart beds can interface with information systems to transfer information collected and alert healthcare providers when a patient is getting out of bed unattended. Smart cards collect and store information about patients that is crucial to providing safe care to that individual patient. Such information would help many individuals following natural disasters, such as hurricanes or earthquakes,

**Table 4: Categories of functions impacted by technology solutions. (Frequency greater than 10)**

Category	Frequency
Documentation	232
Medication	167
Communication	157
Orders	109
Equipment	86
Supplies	65
Multifunction	64
Information	52
Education	51
(Patient)	(28)
(Unspecified)	(15)
(Provider)	(8)
Locator	47
(Patient)	(33)
(Staff)	(9)
(Physician)	(5)
Patient ID	33
Availability	30
Scheduling	28
(Patient)	(15)
(Unspecified)	(11)
(Staff)	(2)
Sign on/access	27
Report	27
Care delivery	26
Family	18
Plan of care	17
Discharge planning	14
Data entry	11



provided they keep the cards with them. A controversial proposal is to implant a chip into individuals so this crucial information is not lost as a result of lifestyle or disaster.

Barcode technology is also included in the class of technologies improving patient safety and is used predominately with medication administration systems to match patients and prescribed drugs, thereby reducing medication errors. Barcode technology can also be used for equipment and supplies distribution and charging, automating portions of the process. Related to equipment and supply distribution, is the use of RFID technology. Nurses spend an inordinate amount of time tracking supplies and equipment. Radio frequency identification (RFID) technology uses radio waves to locate and track items needed for patient care, reducing time used to hunt and gather needed items to deliver care. Robotic systems are another technology that assists with distribution of equipment, supplies, and specimens. Robots have needed computerization to allow them to pick up or deliver items throughout the institution. They can be programmed to summon elevators and enter them, assuring priority status for their task. They move freely on their planned route, stopping when an obstacle, including a person, is in their path and redirecting themselves on a safe route to their assigned destination.

Decision-support systems are another category of technology that can impact nursing practice. Mimicking the decision process of experts these systems can help novice nurses reach a safer decision about patient care when those experts are not available to them, such as during the night or on weekends when fewer resources are available. And finally educational and reference technology represents networked patient education systems, patient bedside Internet access, and unit-based Internet access for nursing personnel. This type of technology allows patients and providers continuous access to information needed to make informed decisions about care.

### **IMPACT**

Nurses believe it is essential to have smart, portable, point-of-care solutions for capturing and transmitting data, as well as routine communication. They also want technology to reduce demand on nursing time by eliminating waste in care resulting from inefficient workflows. The study demonstrated the greatest impact of technology is on written communication and data, followed by improvement in safe delivery of care, system integration, supply chain, and oral communications. Technology can also eliminate waste, alleviate some staffing and workload issues, assist in tracking staff, physicians, and patients, facilitate the medication cycle, and improve the efficiency of the physical environment. Additionally technology can reduce some of the stressors that result in an emotional reaction to inefficient workflows or poor work environments.

Nurses expressed their disappointment with many existing technologies that lead to "work-arounds" or ways to adapt technology that is not user-friendly, or does not provide necessary functionality. It is clear from the descriptions of work practices, that the medical-surgical inpatient RN workflow is highly com-

plex. The environment is chaotic, and there is a need for speed in all transactions and interfaces with any type of technology. Around 60 percent of the study sites utilized some type of electronic nurse charting as well as CPOE (computerized provider order entry). The combination of part paper, and part electronic systems, was repeatedly cited as complicating workflows. Further, the desire for rapid retrieval of data as well as more user-friendly systems and devices, underscored the desire for efficiency at the point of care.

### **SHAPING AND ADOPTING TECHNOLOGY**

It is time to build the technology nurses want. The voice of the nurse benefits hospital executives and technology producers.

**The average age of registered nurses is 48, with a staggering one and a half million eligible for retirement over the next five years—47 percent of the current workforce.**

Nurses do not want to be passive consumers of technology, but they do want to be partners in the design and testing of new and innovative applications and devices that are patient friendly and affordable. Involving nurses as end-users in the early stages of system analysis and design specifications can lead to better adoption of new technology, as well as identifying how current technology can be adapted for greater user acceptance. Nurses have articulated their needs for information systems and devices that automate manual functions, speed the delivery of information, and add incremental measures of safety. Nurses' unique needs should drive technology development, with better functionality and integration across systems. Nurses want technology solutions that will not only improve delivery of care, but also reduce nursing demand, and reduce the physical burden of work, thus improving retention. It is important to remember nurses often have information and work process needs different from other healthcare providers, which call for unique solutions.<sup>11</sup> Improved technologies can eliminate waste in nursing workflow resulting from inefficient work patterns, interruptions, inaccessible information and documentation and missing supplies, equipment and medications.

Reducing the opportunity for error improves patient safety. Technology driving medication administration systems, improved communications, timely acquisition of equipment and supplies, and fool-proof patient identification are just some applications that improve safety.

There is great value in point-of-care devices and systems that accomplish data entry or retrieval, and documentation more quickly. Wireless systems that provide rapid efficient communication, free up the nurse to spend more time on patient interaction, as well as higher-level cognitive functions such as planning and analyzing care are needed. The value added benefits of technology and automation in nursing, enable care to be delivered in a timely, compassionate manner.<sup>12</sup> Technology solutions should expedite multiple actions associated with a task, for instance documenta-



tion of vital signs when measured by an automated device, issuing a charge and adjusting inventory when retrieving a supply item, and eliminating duplicate communication either written or voice. Technology solutions should also provide access to resources in the moment—physicians, pharmacists, and interpreters ranking at the top of the list.

### **THE IDEAL MEDICAL-SURGICAL UNIT ENVIRONMENT**

It is the beginning of the shift and the nurse has information about the patients assigned for the next twelve hours. The information is in a hand-held device which also allows easy retrieval of orders, medication list, task list, plan of care, and test results. The device also allows two way communication with nurse call, paging system, internal and external phones, the clinical information system and the inter- and intra-net. Smart equipment is collecting and downloading physiologic measurements along with patient location and movement within the bed, room, and bathroom. The patient and family use the bedside hardware to communicate with internal departments (e.g., meal selection, entertainment, patient education), external family and internet, and summon assistance from the nurse. The bedside device also provides translation services on demand, recording and transcribing essential information. Barcode or RFID readers in the patient's room ensure accurate patient identification, staff identification and tracking, complete monitoring and recording of the medication cycle, as well as reordering and charging for supplies and equipment. The clinical information system (equipped with bio-identification for logon) provides quick access to data and decision support software that alerts the nurse to changes in the patient's condition that are potentially threatening. Voice commands activate internal communications as well as data entry into the CIS. Throughout the shift, replenishment of medications, nutritional aids, supplies and linens occurs automatically without additional action on the part of the nurse. The room is programmed to dim lights and play soothing music, or conform with other pre-identified preferences so the patient can enjoy periods of rest and sleep. When the patient logs into the bedside hardware to check-out, a hard copy (or e-mail) record of discharge instructions prints for pick up as do prescriptions, and follow-up contact information. The check-out also signals the transportation team for pick up and the patient arrives at the front door to meet their family who are arriving in patient pick-up. The nurse activates the bed coordinating check-out system to ensure the room is made ready for the next patient. All in a day's work, but also mostly hands free.

### **HEALTH POLICY IMPLICATIONS**

Nurses support implementation of standards for interoperability. Their repeated requests for sharing data across systems were consistent with the work of the Healthcare Information Technology Standards Panel (HITSP), and the Office of the National Coordinator supporting the harmonization of standards needed in products that enable the movement of electronic health information from one entity to another.<sup>13</sup> Nurses support federal initiatives

to remove barriers to promote interoperable health IT that will improve quality and efficiency of healthcare, as well as empower consumers to manage their health information.

### **WORKFORCE IMPLICATIONS**

Returning more RN time to direct patient care positively influences patient outcomes, increases nurse satisfaction, and helps address the shortage of nurses. It is well established that the greater presence of RN time with patients, the lower incidence of undesirable complications of hospitalization such as falls, urinary tract infections, pressure ulcers, and mortality. Not only nurses who are aging, but all nurses want a manageable workload unencumbered by inefficient systems. Nurses are not technology-

## **A patient relationship management application allows hospitals a better understanding of patients' needs and wants through improved communication via follow-up systems.**

averse. They embrace tools that help prevent errors, improve process, and provide information to allow them to practice confidently and competently. Technology will not replace nurses, but will augment and automate essential work processes.

Technology should be ubiquitous, helpful and unobtrusive. If appropriately designed, technology will positively impact each of the workflows identified as areas of concern by the nurses in the TD2 study. We need to develop technology that will reduce the demand placed on nurses in today's fast-paced and labor intensive environments. Nursing-technology partnerships are vital for our future.

The TD2 process can help identify inefficient and burdensome workflow processes that can be improved with technology. The Academy offers a free DVD describing the entire process on its website. The Facilitator's Guide can be viewed and downloaded from the website at AANNET.ORG.

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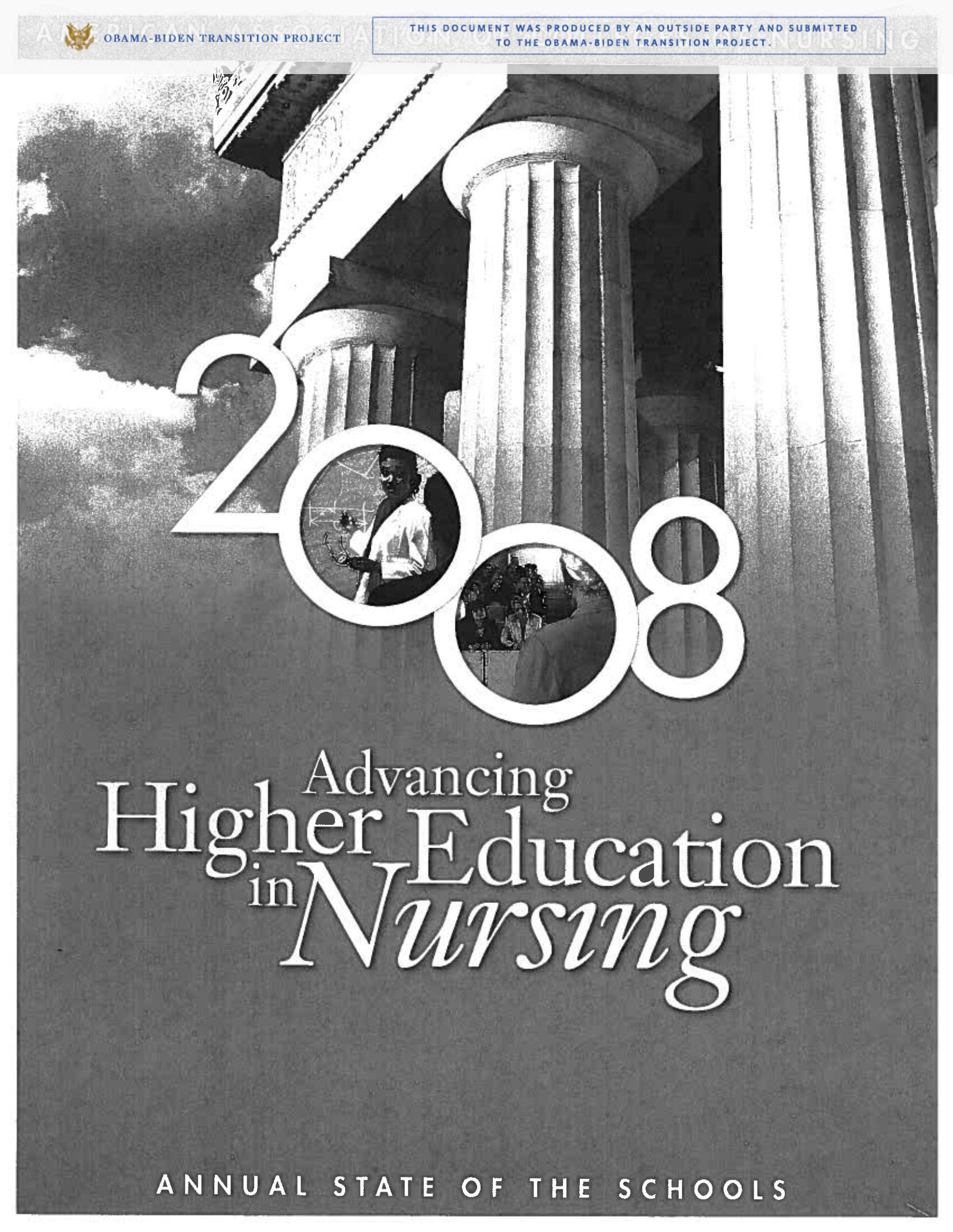
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# Highlights of the Year

## July 2007

AACN conducts its annual survey of faculty vacancies in baccalaureate and graduate nursing programs. Results show a national faculty vacancy rate of 8.8 percent.

## August 2007

AACN awards funding to eight new scholars through The California Endowment-AACN Minority Nurse Faculty Scholarship program.

## September 2007

Johnson & Johnson's Campaign for Nursing's Future joins with AACN to create the Minority Nurse Faculty Scholars program.

The Task Force on the Revision of the Baccalaureate Essentials hosts its first regional meeting in San Diego.

## October 2007

The AACN Board of Directors creates the Commission on Nurse Certification (CNC) to oversee the administration of the CNL certification examination.

AACN recognizes the University HealthSystem Consortium with the 2007 BSN Champion Award.

## November 2007

AACN's annual Baccalaureate Education Conference draws hundreds of nurse faculty to New Orleans for a program titled *Striving for Quality in Baccalaureate Nursing Education*.

## December 2007

The Archstone Foundation of Long Beach, CA provides \$900,000 in new funding to the ELNEC project to fund Geriatric and Critical Care courses.

## January 2008

The CNL Partnership Conference is held in Tucson with hundreds of education and practice partners sharing success stories and positive outcomes associated with CNLs in practice.

## February 2008

AACN releases the published reports from its Fall 2007 survey, which show across-the-board enrollment increases, including entry-level BSN programs (+5.4%); RN-to-baccalaureate programs (+11.5%); master's programs (+11.7%); and research-focused doctoral programs (+0.9%).

## March 2008

AACN members endorse the position statement on *The Preferred Vision of the Professoriate in Baccalaureate and Graduate Nursing Programs*.

The AACN Board of Directors releases the *Statement in Support of Geriatric Nursing Education*, which outlines the association's long-term commitment to this important work.

## April 2008

The Robert Wood Johnson Foundation (RWJF) joins with AACN to launch the groundbreaking New Careers in Nursing Scholarship Program - a \$15 million, three-year initiative.

AACN hosts a Military Nursing Shortage Briefing on Capitol Hill featuring nurse leaders from the Army, Air Force, and Navy Nurse Corps.

## May 2008

In honor of National Nurses Week, AACN offers members the chance to post free faculty vacancy announcements on our Web-based Faculty Career Link. More than 200 positions are advertised.

## June 2008

In Chicago, the ELNEC project holds its 50th national conference and marks the occasion with a Celebration Gala for all current ELNEC trainers.

AACN serves as a program advisor and facilitator for the National Summit on the Nursing Shortage and Educational Capacity hosted by RWJF, HRSA, and the Department of Labor.