



The Grand Challenges and nursing



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What are the Grand Challenges? For nearly 30 years, governments around the world have been allocating their resources to address problems known by several specific names, but generally known as the Grand Challenges. These problems were modeled after the work of David Hilbert, a mathematician, who more than 100 years ago developed a list of the unsolved problems he believed to be mathematics' most significant, known as Hilbert's Problems. The Grand Challenges are difficult problems that stretch the limits of cognitive or cooperative skills. The solutions to the Grand Challenges will fundamentally alter current practice through their broad application and meaningful impact, while providing a high return on investment. A number of disciplines, particularly in science and engineering, have developed a set of Grand Challenges around which to focus intellectual resources.

Notably, the National Academy of Engineering (NAE) has established 14 Grand Challenges as well as programs to engage experts and students in a dialogue focused on these problems. As examples, the current NAE Challenges include: (1) making solar energy economical, (2) providing access to clean water, (3) advancing health informatics, (4) advancing personalized learning, (5) reverse engineering the brain, and (6) enhancing virtual reality. (The complete list of Grand Challenges may be found at <http://www.engineeringchallenges.org>.) Addressing the full set of 14 Challenges are 2 specific programs. The NAE Summit Series on Grand Challenges convenes meetings of experts and students throughout the year and at various locations for the purpose of discussing progress and approaches to the Challenges. The NAE Grand Challenge Scholars Program includes curricular and extracurricular elements, focusing students on the Challenges. The curricular commitments include 5 areas to be included in the formal program: (1)

student research addressing the Grand Challenges, (2) interdisciplinary education, (3) entrepreneurship, (4) global focus, and (5) service learning. The NAE maintains a website for experts and students to communicate about the Challenges.

Perhaps more familiar is the Grand Challenges in Global Health Initiative, initially funded by a partnership including the Bill & Melinda Gates Foundation, the Canadian Institutes of Health Research, the Foundation for the National Institutes of Health, and the Wellcome Trust (<http://www.grandchallenges.org>). The overall goal of this initiative is to improve health in the developing world by addressing 14 challenges relating to:

1. improve vaccines,
2. create new vaccines,
3. control insect vectors,
4. improve nutrition,
5. limit drug resistance,
6. cure infection, and
7. measure health status.

Research funds are awarded through the Grand Challenges Exploration Initiative to teams of scientists submitting proposals judged to address critical scientific barriers with unique and creative solutions of merit. A second component provides support for the Grand Challenges: Point-of-Care Diagnostics Opportunity, the aim of which is to fund promising diagnostic tools that will have rapid uptake in resource-poor communities.

Obviously, some of the Challenges identified by the NAE and the Global Health Initiative require interdisciplinarity for their solution. The NAE's Challenge of providing access to clean water serves as one example, as does the Global Health Initiative's goal of improving nutrition. No doubt, nurses throughout the world are able and willing to join teams who will address such important Challenges. But I want to ask the larger community of nurses, "What you would place on the list of the

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Grand Challenges solved by the discipline of nursing?”

As the American Academy of Nursing approaches the development of its next Strategic Plan (<http://www.aannet.org>, Strategic Plan 2010–2013), I want to encourage our Fellows to help identify Nursing’s Grand Challenges. Inspired by Margretta M. Styles, who asked, “Imagine a world without nurses,” I want to ask you to “Imagine a world in which we have solved Nursing’s Grand Challenges.” What would it look like?

Some may say this was the objective of The Alma Alta declaration in 1976, in which public health experts advocated for primary health care access for people throughout the world by 2000 (http://www.who.int/hpr/nph/docs/declaration_almaata.pdf). Others may say that this is the goal of the United States Public Health Services Healthy People 2020 (<http://www.healthypeople.gov>). I would argue that those relevant documents are overlapping of our interests but do not address the problems that nursing can lead toward resolution. As is true of the Grand Challenges identified by other groups, some of the Challenges we identify will benefit from or even require interdisciplinary thinking and

cooperation to advance novel and impactful solutions. Permit me to share a few examples.

1. *What can we do to improve the health literacy of all people?* Health literacy is defined as the degree to which individuals have the capacity to obtain, process and understand basic health information needed to make appropriate health decisions and services needed to prevent or treat illness (<http://www.HRSA.gov/healthliteracy>). Many groups share this interest, including the Institute of Medicine’s Health Literacy Roundtable, but nurses are in critically important positions to lead the development and implementation of solutions to this vast, global problem. This is a broad Challenge, indeed.
2. *How can we develop systems of medication delivery and management to prevent error, overdose, and unnecessary side effects?* Medication error kills, young and old alike. Whether people are institutionalized or in the community, medication delivery and management impact quality and length of life, the design and costs of care delivery. Although many

professionals are involved in the chain of medication delivery, the nurse is most often the last professional in the chain. What is our solution to this Challenge, which has broad impact but is decidedly more specific?

3. *How can we bring new nurses into the discipline who will understand the power of innovation?* This Challenge is, admittedly, more inward in focus and is inspired by the NAE curriculum commitment to entrepreneurship. How can we prepare the future nursing workforce to use their creative talents in innovation for broad scale improvement, rather than to continue the “workaround”? How can we learn to (and prepare others to) innovate and translate solutions to a broader audience?

I anticipate disappointment in my own short, beginning list of Challenges, but I ask that you channel such disappointment into forwarding your own list of the most important Grand Challenges for Nursing to me at the AAN web site (<http://www.aannet.org>). Your help is welcome, and the time to generate our Grand Challenges is now.

MISSION STATEMENT

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5. Promote the synthesis and use of scientific knowledge in a timely fashion by nurses and other healthcare professionals to enhance the quality and efficiency of healthcare.
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