Nursing’s Role in Improving Health Outcomes Following Disasters and Major Public Health Emergencies
Broad array of hazards that create risk to human health
Extremely challenging to prepare a national workforce for response
Resultant risk is major gaps in response capabilities
Defining Readiness

• February 2018 report: U.S. NOT ready
• Catastrophic events (PanFlu, Bio, Radiation/Nuclear)
• Difficult to quantify ‘preparedness’
• What is the optimal health care system to manage medical needs in a disaster?
Tener Goodwin Veenema, PhD, MPH, MS, RN, FAAN, has been chosen as the 2017-2018 Distinguished Nurse Scholar-in-Residence at the National Academy of Medicine (NAM). The program provides a yearlong leadership opportunity to participate in shaping health policy.

Veenema plans to use the time to expand her leadership experience in advancing national preparedness and interprofessional workforce readiness in public health emergencies.

"I am deeply honored to be selected for this wonderful opportunity to represent nursing and I look forward to working with colleagues at NAM to advance the science that underlies health policy for disaster and public health emergency preparedness," said Veenema, an ANA member.

Currently, Veenema is associate professor of Nursing and Public Health at the Johns Hopkins School of Nursing and the Center for Humanitarian Health at the Johns Hopkins Bloomberg School of Public Health. She serves as a member of the National Academy of Medicine's Standing Committee for the Centers for Disease Control and Prevention Division of Strategic National Stockpile. Veenema is the editor and author of the book *Disaster Nursing and Emergency Preparedness for Chemical, Biological and Radiological Terrorism and Other Hazards* and has published more than 50 peer-reviewed journal papers. She is the recipient of the Certificate of Distinguished Service from the National American Red Cross and was awarded the Florence Nightingale Medal of Honor from the International Red Crescent.
National Academy of Medicine (NAM)

• Founded in 1970 as the Institute of Medicine (IOM), the NAM is one of three academies that make up the National Academies of Sciences, Engineering, and Medicine in the US
• Operates under the 1863 Congressional charter
• Mission: *To improve health for all by advancing science, accelerating health equity, and providing independent, authoritative, and trusted advice nationally and globally*
• Vision: *A healthier future for everyone*
The NAM/AAN/ANA/ANF Distinguished Nurse Scholar-in-Residence program is designed to assist outstanding nurse leaders to play a more prominent role in health policy development at the national level. The program seeks individuals who have the capacity and skills to bring issues of special interest in nursing to greater public understanding and policy attention. As part of the program, the scholar is asked to produce a policy-oriented paper based on her/his area of special interest or become actively involved in a National Academies study related to his/her area of expertise.

The program, initiated in 1992, is supported by the American Academy of Nursing, the American Nurses Association, and the American Nurses Foundation and conducted by the NAM. Each year, one senior nurse scholar is selected from an eligible institution or organization to come to Washington to participate in a 1-year program of orientation and work at the National Academies of Sciences, Engineering, and Medicine.
NAM Nurse Scholar Project: National Nurse Workforce Readiness for Radiation Emergencies and Nuclear Events
Radiation/ Nuclear Emergencies

- Nuclear power plant emergencies
- Industrial radiation releases
- Radiation Dispersal Devices (RDDs or “dirty bombs”)
- Nuclear level weapons
Radiation Emergencies and Nuclear Events as a Catastrophic Threat
Radiation/Nuclear Risk

- Given current geopolitical tensions between countries in possession of nuclear weapons, the need for a health care workforce with the knowledge, skills and abilities to respond to radiation and nuclear public health emergencies is critical.
- All-Hazards planning has resulted in gaps in catastrophic event preparedness.
- Current response capacity of the nation’s 3.1 million registered nurses—the largest component of the US healthcare workforce to protect patient safety and provide care in the event of a nuclear or radiological disaster is unknown.
The challenge in addressing mega-catastrophe

- Low frequency, high impact events
- Perception of risk low
- Collective denial
- Sense of nihilism
- PSR: Ethical issues with nuclear preparedness
- Diplomacy & Disarmament
- Planning complicated by lack of full disclosure, requires full Security clearance
Hawaii
CDC: Be Ready for Radiation Emergencies

- Get Inside
- Stay Inside
- Stay Tuned
Reality

- Nuclear event is one of the top 21st Century threats.
- Radiation emergency/nuclear event is a nurse intensive throughout every phase of the disaster event.
- Lives can be saved even after a nuclear event.
- National planning documents are predicated on the assumption that we will have enough nurses, that the nurses will have the knowledge and skill set to respond and that nurses will be willing to respond.
Radiation/Nuclear Emergencies are Nursing-Intensive Events

- Community screening (biodosimetry/bioassay)
- Triage
- Decontamination
- Medical countermeasures
- Burn Care
- Palliative Care
- Counseling and mental health
- Recovery of the Health System
Health implications of a Nuclear disaster

- Morbidity
- Mortality
- Blast injuries
- Burns
- Fallout
- Mental Health
Disaster Response is Event Specific

- Nurses roles and responsibilities are not generic across all events
- One set of disaster nursing competencies is not adequate or appropriate
- Nurses will be needed across MULTIPLE clinical and community settings
- NRRRTs: Nurse Radiation Rapid Response Teams will be needed to DEPLOY and provide BASE CAMP guidance
Why is this work important?

- Strengthen our capacity to manage a large scale burn event
- Facilitate mobilization of the Strategic National Stockpile (MCMs dispensing)
- Expand cancer care in a rapidly aging community
- Nurse safety/nurse survival
Factors Affecting Hospital-based Nurses’ Willingness to Respond to a Radiation Emergency

Tener Goodwin Veenema, RN, PhD, MPH, MS, CPNP, Bonnie Walden, MS, RN,
Nancy Feinstein, PhD, RN, and Jacqueline P. Williams, PhD

ABSTRACT

Background: Despite increased government and public awareness of the threat of a radiological emergency resulting from a terrorist attack or industrial accident, limited emphasis has been placed on preparing the US health care workforce for such an event. The purpose of this study was to develop and apply a rapid survey to evaluate hospital-based nurses’ baseline knowledge, self-assessed clinical competence, perception of personal safety, and willingness to respond in the event of a radiological emergency.

Methods: The study was conducted in 2 phases, the first targeting nursing units likely to respond in the event of a radiological emergency and the second focusing more generally on members of the New York State Emergency Nurses Association currently employed as hospital-based nurses.

Results: Among the 668 nurses surveyed, baseline knowledge was found to be inadequate. Although baseline knowledge, clinical competence, and perception of personal safety were all positively associated with willingness to respond, perception of safety appeared to be the primary determinant. Furthermore, baseline knowledge did not appear to be strongly associated with perception of personal safety.

Conclusions: Based on these results, investigators recommend further clinical training to enhance preparedness and a more detailed exploration of the determinants of perceived personal safety. (Disaster Med Public Health Preparedness, 2008;2:224–229) Key Words: nursing, radiation emergency, radiological terrorism, perceived safety, willingness to report

In the decades since the end of the Cold War, the threat of a major radiation emergency, intentional or otherwise, remains an unfortunate reality. Radiological incidents have resulted in large-scale evacuations, hospitalizations, deaths due to radiation sickness, and long-term health effects. Such a scenario would have devastating consequences on a region’s health care system and workforce, including nurses. Concerns regarding the use of radiological incidents to disrupt the United States is of paramount importance to the Department of Homeland Security and media reports document the government’s heightened concerns regarding the potential use of radiological dispersal devices (“dirty bombs”) by terrorists. Although the United States has made preparations for natural disasters as well as biological and chemical terrorism-related incidents a priority for government and military agencies, response to radiological threats remains one of the least emphasized aspects of current terrorism preparedness efforts. Unintentional radiation exposures from industrial accidents and nuclear power plant failures, such as those that occurred at Three Mile Island (1979) or Chernobyl (1986) also present unique challenges to health care workers.

It is important to recognize that there is minimal health risk to nursing or emergency personnel from working with patients exposed to high levels of radiation. Patients contaminated, even at high levels, pose little to no threat; radiation exposure and contamination are not likely to be significant hazards to staff. Staff can protect themselves from radioactive contamination by using universal precautions while treating these patients. As opposed to chemical or biological agents that arrive with contaminated patients, radioactive contamination is easy to detect.

Nurses comprise the largest segment of the health care workforce and, in the event of an emergency, would constitute the front line in patient care. Despite the minimal risk associated with caring for exposed individuals, many nurses have significant anxiety related to treating patients exposed to radiation. This anxiety is generally exacerbated by insufficient knowledge regarding the true effects of radiation, inability to recognize radiation injuries, or lack of appropriate clinical experience with patients involved in radiological incidents. Inadequate knowledge on the part of health care providers has historically resulted in the delay or denial of treatment to mildly contaminated patients, underestimation of...

The Nuclear Accident

Radiation Continues To Leak From Crippled Plant

HARRISONBURG, Va. (AP) — Radiation leak from the Three Mile Island nuclear reactor in Pennsylvania has been contained and is not posing a threat to anyone’s health, officials said. The reactor, which is a boiling water reactor, is being shut down for maintenance and repair.

The reactor has been offline since 1979 when a partial meltdown occurred inside the reactor vessel and a loss of coolant accident happened.

An aerial view of the Three Mile island nuclear power plant.
Fukushima Daiichi, Japan

11 March, 2011
Understanding Nursing’s Role in Health Systems Response to Large-Scale Radiologic Disasters

Tener Goodwin Vienseno, PhD, MS, RN, FAAN, and Cynthia P. Thornton, MSN, RN, CNRN

ABSTRACT: Guidance for the optimal management of patient care after a radiologic disaster is limited and not taught in schools of nursing or staff development/continuing education programs. To prepare and respond to this low-frequency, high-impact event, nurses require a substantive body of knowledge and skill set on which to base both public health and acute care preparedness and response efforts. Hospital and public health agencies have developed incident command systems and disease-specific guidelines to address these needs. However, many nurses lack the knowledge and skills needed to effectively intervene in a radiologic emergency and respond to situations requiring a systems approach. This article integrates core competencies for radiologic response with established principles and practices for public health preparedness. We provide a protocol for triage, evacuation, patient stabilization, and decontamination, including personal protective equipment, management of medical and nonmedical issues, and intersystem coordination.

INTRODUCTION

High-rise radiologic exposure is an emergency, butliability issues for making medical care available & necessary. Nurses can provide crucial care for those exposed to nuclear fallout. This article provides a framework for nurses to respond to the needs of patients, families, and communities in the aftermath of a radiologic disaster.

BACKGROUND

Nurses are often the first to provide care after a radiologic event. They can play a critical role in assessing the needs of patients, families, and communities. This article provides a framework for nurses to respond to the needs of patients, families, and communities in the aftermath of a radiologic disaster.

Keywords: Radiologic Disaster, Nursing, Public Health Preparedness.
Three Studies to Understand the Issue and Inform the Workforce Development Plan

#1 National Nurse Readiness for Radiation Emergencies and Nuclear Events: A Systematic Review of the Literature

#2 National Assessment of U.S. Nursing Schools and Nurse Educators Readiness for Radiation Emergencies and Nuclear Events

#3 Analysis of Nurse Specific Roles in Federal Radiation and Nuclear Disaster Planning Documents

#4 Developing a National Nursing Workforce in Light of the Increasing Threat of a Nuclear Event
National Nurse Readiness for Radiation Emergencies and Nuclear Events: A Systematic Review of the Literature

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5Supporting Professional Advancement in Nursing (SPAN) Program, Johns Hopkins School of Nursing, Baltimore, MD

ABSTRACT

Background: Little is known regarding the capacity of U.S. nurses to respond following a large-scale radiation release, despite its relevance to our National Security Strategy.

Purpose: To conduct a systematic review of the literature to assess nurse readiness for radiation emergencies and nuclear events.

Methods: A systematic review of publications identified through a comprehensive search of four relevant databases (Embase, PubMed/Medline, Scopus, and Web of Science) was conducted (N = 62).

Findings: Limited evidence exists to support that nurses are prepared or willing to respond to a large-scale emergency resulting from a radiation release or nuclear-level event.

Discussion: History suggests nurses will be expected to perform triage, minimize radiation exposure, decontaminate, manage trauma, treat burns, and coordinate care for patients. Research is needed to identify the specific roles and responsibilities of nurses in radiation emergencies and nuclear response and to ascertain quantitative measurement of the level of national nurse readiness for these large-scale radiation emergency and nuclear events.

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The National Academies of SCIENCE • ENGINEERING • MEDICINE
Study #1 National Nurse Readiness for Radiation Emergencies and Nuclear Events: A Systematic Review of the Literature

• Results
  Majority of the studies III or IV (low evidence). Thematic analysis revealed wide variation regarding focus of inquiry. Studies addressed themes related to nurse readiness but did not measure readiness itself. Robust metrics for measuring readiness were absent.

• Conclusions
  Empirical evidence related to nurse readiness is predominately descriptive in nature and address the roles and responsibilities nurses would need to fill but our review failed to provide quantitative attestation to support that nurses are able and willing to serve in these roles.


- Cross sectional study using online Radiation Nuclear Survey (RNS)- a questionnaire derived from previously published studies (Veenema, et. al, 2008; Chaney, et. al, 2018) and input from SMEs in radiation and nuclear emergency preparedness (Coleman & Kneble).

- Partnership with AACN and OADN, 3,301 surveys sent over 2 weeks in May 2018
  - AACN = 880 members schools
  - OADN = 2,421 members schools and individuals
  - Participation was voluntary and anonymous

- Response Rate-Overall, 20.6%
  - AACN, 71.5%
  - OADN, 2.1%

- 605 respondents elected to provide a zip code (optional)

- Analysis: Qualtrix Research Suite
SON Demographics and Programs Offered

### Nursing Degree Programs Offered as Reported by Respondents

<table>
<thead>
<tr>
<th>Degree Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate Degree</td>
<td>31.70%</td>
</tr>
<tr>
<td>Baccalaureate Degree</td>
<td>5.70%</td>
</tr>
<tr>
<td>Masters Entry into Practice Degree</td>
<td>14.80%</td>
</tr>
<tr>
<td>Graduate Degree</td>
<td>35.00%</td>
</tr>
<tr>
<td>Professional Certificate</td>
<td>12.80%</td>
</tr>
</tbody>
</table>

### Survey Respondent Role at School of Nursing

#### Respondents Role in Pre-licensure Programs (n=677)

- **Dean or Director:** 23.2% (157)
- **Associate Dean or Associate Director:** 10.2% (69)
- **Faculty Member involved in Curriculum decisions:** 43.6% (295)
- **Faculty member with little involvement in curriculum decisions:** 17.0% (115)

#### Respondents Role in Graduate Level Programs (n = 674)

- **Dean or Director:** 17.8% (120)
- **Associate Dean or Associate Director:** 8.0% (54)
- **Faculty Member involved in Curriculum decisions:** 30.3% (204)
- **Faculty member with little involvement in curriculum decisions:** 26.0% (175)
Radiation/Nuclear Emergency Preparedness N= 774

- 92.5% believe radiation & nuclear emergency preparedness is important
- 75.1% of schools teach <1 hour of radiation/nuclear emergency preparedness
- 91.3% of faculty would not know what to do

Why is it not being taught?
- Inadequate time in the curriculum, 26.4%
- Topic not mandated in BS or MS Essentials document, 18.8%
- Never occurred to teach radiation/nuclear content, 20.7%
- Not sure why their school did not teach radiation/nuclear content, 22.6%
- Not important and or no perceived risk of this event, 10.4%
- No perceived risk of this type of event for our area
SONs and Faculty Do Not Recognize their Vulnerability

87.5% of nursing schools do not have a radiation/nuclear disaster plan
94% of schools have not tested or drilled for a rad/nuclear emergency
91.3% of faculty do not know what to do for a rad/nuclear emergency
31.3% Topic is not important or relevant to our school/no perceived risk

- 295 respondents located within 50 mile EPZ of nuclear facility
  - 53% did not know they were within 50 mile EPZ when in fact they were.
  - Perceived Risk vs. Actual Risk
Study #3 Veenema, T.G., Couig, M.P., Lavin, R.P., Qureshi, K., Casey-Lockyer, M., and Gable, A. Analysis of Nurse Specific Roles in Federal Radiation and Nuclear Disaster Planning Documents
NAM Nurse Scholar Activities

Assistant Secretary for Preparedness and Response

- June & October 2018 meetings with Dr.'s Kadlec and Yesky
- Work to align this project with ASPR vision of a redesigned, flexible and nimble, strengthened NDMS
- Develop a model National Nurse Response Teams (NNRTs)-deployable and Radiation Base Support Teams (RBSTs)- non-deployable
- Congressional action on national Health Policy to better support HCP workforce development for disasters
- Advance national nurse readiness for radiation emergencies and nuclear events.
NAM Nurse Scholar Activities

- Planning committee member and presenter: *Challenges in Initiating and Conducting Long-Term Health Monitoring of Populations Following Nuclear and Radiological Emergencies in the United States* to be held March 12-13, 2019

Johns Hopkins University Discovery Award

• Awarded June 8, 2019  JHU Discovery Award for the development of Disaster Health Digital Twin Using Systems Dynamics

• Hans Mair (Applied Physics Lab), Tener Veenema (Nursing), Amy Haufler (Applied Physics Lab) & Teresa Nowak (Applied Physics Lab)
NAM Activities

- IOM Standing Committee for the Centers for Disease Control and Prevention, Division of Strategic National Stockpile (2015-2017)
- NAM CDC/NIOSH Committee on the use of Elastomeric Respirators in health care (2017-2018)