**Nursing “State of the Art” (SOTA) Executive Summary**

The US is faced with a national nursing shortage and understanding VA nursing workforce trends is essential to keeping VA hospitals, community living centers, and clinics open. Similarly, as nursing accounts for the largest VA workforce, improving the care that nurses deliver is vital to improving Veteran access, quality, outcomes, and experience. To prioritize research on the nursing workforce and nursing practice, a Nursing “State of the Art” (SOTA) Conference was held and included researchers, clinicians, and health system leaders to create a VA Nursing Science Agenda. Organizing partners included the Office of Nursing Services (ONS) and the Office of Research and Development (i.e., Health Systems Research, Quality Enhancement Research Initiative [QUERI], and Rehabilitation Research and Development).

This agenda outlines recommendations for future research, implementation, quality improvement, and evaluation on optimizing nursing practice and supporting the nursing workforce to improve Veteran care. In addition to identifying these priorities, the SOTA conference also made recommendations to improve nursing science capacity and infrastructure. For more information, visit the [Nursing SOTA webpage](https://www.hsrd.research.va.gov/meetings/sota/#19) or contact [Amelia.Schlak@va.gov](mailto:Amelia.Schlak@va.gov) for updates from the VA Office of Research and Development and [Sheila.sullivan2@va.gov](mailto:Sheila.sullivan2@va.gov) for updates from VA ONS.

**VA Nursing Research, Implementation, Quality Improvement, and Evaluation Priorities**

The VA Nursing Science Agenda acknowledges the broad number of initiatives underway by ONS and is in alignment with the [Nursing Workforce Strategic Plan](https://www.va.gov/NURSING/docs/about/2022_ONS_Annual_Report.pdf). Focused research, implementation, quality improvement, and evaluation efforts on nursing workforce and practice issues are needed to provide evidence-based information to improve the VA health system. Below are 5 strategic areas that SOTA participants identified as priorities for future VA nursing science.

**Priority 1: Understanding Nurse Staffing Needs**

1. ***Staffing Measures and Outcomes***
   1. What is the relationship between staffing levels, skill mix, workload, services provided, and outcomes for the Veteran, staff, and organization? Variations by unit type and facility complexity level should be considered. For example, measures signaling changes in nurse workload and staffing that can be considered at the patient, nurse, unit, and/or hospital-level are needed.
   2. Nurses also supervise nursing students, registered nurse residents, and nurse practitioner residents. Research is needed to examine nursing student and resident contributions to clinical workload, accounting for the costs of nurse supervision and training. Assessments of nursing student and resident programs are needed to determine the impact on nursing workforce outcomes, care quality, and patient outcomes.
   3. Are there existing nurse sensitive indicators (related to the quality of nursing care) in need of evaluation? What are potential nursing sensitive indicators that can be developed for understudied care settings (e.g., primary care, home care, etc.) and growing areas of nursing practice (e.g., telehealth, social determinants of health)?
2. ***Care Models***
   1. Examples of care models include the Transitional Care Model [TCM], Community Aging in Place- Advancing Better Living for Elders [CAPABLE], Program of All Inclusive Care for the Elderly [PACE], inpatient staffing models, long term care staffing models, residential care staffing models, home-based care models, among others. This is not an exhaustive list and research on other care models where nursing plays a pivotal role are also encouraged.
   2. What is the purpose of the model, roles of the interdisciplinary team, and variation across VA?
   3. How does the model affect workforce and Veteran outcomes?
   4. Are there new outcomes, particularly Veteran centered outcomes, that are relevant to the performance of nursing in these models?
   5. Studies that consider personnel historically excluded from nurse staffing research (e.g., house keepers, phlebotomists, respiratory therapists, etc.), which impact nurse workload and nurse staffing needs, are highly encouraged. Assessments of current models and programs may focus on the return on investment to inform decisions around their retention or de-implementation.
3. ***Technology***
   1. Are there tools and technologies (e.g., dashboards, integration of AI into staffing methodology) that can be developed to support nurse staffing decision-making in real-time at multiple levels of the health care system (e.g., unit, facility, VISN, national)?
   2. Are there tools and technologies (e.g., AI, virtual reality, telenursing, remote monitoring) that can improve the provision of nursing care or support nurse staffing needs?
   3. Specific areas of interest include how emerging technology may alter staffing levels and skill-mix necessary to provide appropriate and safe patient care, as well as how technologies impact nurse well-being, workflow, and/or workload.

**Priority 2: Improving the Nursing Work Environment**

1. ***System Wide Interventions***
   1. What is the variation in nurse work environments across VA care settings?
   2. What are work environment features that are most associated with nurse wellbeing and improved Veteran outcomes? Studies may include comparative examinations of high and low performing settings or teams that report low levels of burnout and turnover compared to others.
   3. What do VA nurses consider meaningful/joyful work and what are models of care that support nurses in performing these activities while delegating and de-implementing low priority activities?
   4. What are promising interventions to improve the work environment and reduce nurse burnout?
   5. Studies examining system-wide, facility-level, unit-level, or team-level interventions are highly encouraged. Interventions targeted at the individual-level such as mindfulness or relaxation exercises are not of interest.
   6. Studies assessing the implementation of effective models, including the barriers and facilitators to adoption and sustainability are encouraged.
   7. Longitudinal and/or controlled studies are encouraged where appropriate.
   8. Some examples of relevant nursing interventions include the nursing shared governance model, the ANCC Magnet and Pathway to Excellence Model, strategies for interprofessional teamwork, Employee Whole Health initiatives, and VA REBOOT programs (e.g., 72/80, etc.). This is not an exhaustive list and research on other interventions to improve nursing workforce outcomes are also encouraged.
   9. Additional research is needed to assess the outcomes for VA nursing students and residents who rotate through VA medical centers and who are at high risk for burnout and turnover. For example, do rotations as a student and/or resident effectively increase VA’s capacity to recruit nurses for VA employment? What other factors influence recruitment and retention of new nurses? There is also a critical shortage of nursing faculty and preceptors. What factors enable and support certified VA nurse faculty and preceptors of nursing students and residents?
2. ***Leadership***
   1. How do existing leadership training programs, the skill-mix of interprofessional executive leadership teams (ELTs), and nursing leadership (e.g., VISN Chief Nursing Officer) impact nurse wellbeing, the nurse work environment, and Veteran outcomes?
   2. What do nurse leaders at different levels need to address nurse well-being?
3. ***Workplace Violence***
   1. What is the variation and effectiveness of workplace violence prevention interventions (e.g., training staff in early detection, patient screening tools, etc.) and/or workplace violence reporting systems across VA?
   2. Studies that incorporate outcomes from multiple perspectives (e.g., Veteran, family, staff), assess the barriers to reporting workplace violence and the associated outcomes, and evaluate longitudinal effectiveness of workplace violence interventions and/or reporting systems are encouraged.

**Priority 3: Optimizing Nursing Practice Around Pressure Injury**

* 1. ***Innovation***
     1. What practices, processes, or technologies are currently available and can be used to prevent and/or detect pressure injuries across care settings? Emphasis is on understanding how these interventions could be used to prevent pressure injury development in the first place or during initial [Stage 1] development, but investigators may consider Stage 2 and beyond with strong justification. Examples of practices include, but are not limited to, seating and positioning practices or other evidence-based approaches (e.g., thermal and moisture scanning, mHealth applications, TeleWound, etc.) that might be expanded across the system or to other disciplines. Examples of processes include, but are not limited to, early detection of pressure injuries present on admission, assessment, staging, evaluation, or care protocol interventions.
     2. What technologies need development, further testing, or validation to aid in the detection of pressure injuries that are present on admission and the prevention or recurrence of pressure injuries? Examples of technologies include, but are not limited to, heat and moisture sensors, cameras, biomarkers, among others. Examples of practices include, but are not limited to, seating and positioning practices or other evidence-based approaches that might be expanded across the system or to other disciplines. Examples of processes include, but are not limited to, assessment, staging, evaluation, or care protocol interventions.
  2. ***Implementation and Evaluation***
     1. What are the current implementation approaches that can be developed or scaled to standardize the improvement of pressure injury detection and care between care providers and settings?
     2. What are the current evidence-based interventions for pressure injury detection, prevention, and treatment in need of evaluation (e.g., effectiveness or feasibility)?
  3. ***Emphasis on Disparities and Routine Care***
     1. Research that prioritizes addressing health disparities and pressure injury detection/risk assessment/development, including in individuals with darker skin tones and those residing within rural areas, is highly encouraged.
     2. Studies of interventions that are implementable during routine care and across care settings, with particular emphasis on supporting informal caregivers and Veterans in taking a more active role in prevention, early detection, implementation of prevention interventions and treatments in the home or community setting are also highly encouraged.

**Priority 4: Optimizing Nursing Practice Around the Social Determinants of Health (SDOH)**

* 1. ***Structure, Process, and Outcomes Needed for the SDOH***
     1. What system or organizational structures are needed to support nurses and interprofessional care teams to adequately identify and address the SDOH?
     2. How are the SDOH identified and addressed by interprofessional teams? Emphasis should be given to understanding the unique roles and responsibilities of nursing staff across different settings and care models.
     3. What is the burden of SDOH activities on staffing needs (e.g., screening, care coordination, benefits navigation, follow-up, etc.)?
     4. Are there SDOH activities that nurses are well suited to intervene on beyond screening and education?
     5. Additional research is needed to understand the role of implicit bias among nurses on Veteran outcomes and how such biases can be addressed.
     6. Research focusing on primary care and home care settings is strongly encouraged.
  2. ***Veteran Preferences Related to the SDOH***
     1. What are Veteran experiences, preferences, and goals related to the nursing interventions to address the SDOH and social needs? Research showing how such interventions are impacting Veteran health and quality of life beyond clinic and hospital walls is highly encouraged.

**Priority 5: Optimizing Nursing Practice Around Care Coordination**

1. ***Evaluation of Nurses’ Role in Care Coordination Models***
   1. Is access and delivery of care coordination equitable?
   2. What is the quality-of-care coordination for different patient populations (including different levels of need/acuity) and across various practice settings?
   3. Are the strategies (e.g., risk assessment tools) used to identify who needs care coordination and the outcomes to assess coordination program success valid?
   4. Which models of care coordination improve patient outcomes?
   5. What are Veteran’s lived experiences with care coordination?
   6. What is the interprofessional team experience with care coordination, particularly those team members that are tasked with providing care coordinating services or case management?
   7. Emphasis should be on nurses’ care coordination actions. For example, in established models (such as Patient Aligned Care Teams [PACT], Transitional Care Model [TCM], Home-Based Primary Care, etc.) what is the nurses’ role, what functions do nurses perform, and are these activities contributing to improvements in patient outcomes? This is not an exhaustive list and research on other care coordination and care management models where nursing plays a pivotal role are also encouraged.

**Improving the VA Nursing Science Infrastructure**

In addition to identifying research, implementation, quality improvement, and evaluation priorities, SOTA participants noted that to answer questions related to nursing, the quality of data must be improved. Additionally, the VA community of nurse scientists (i.e., PhD and DNP prepared nurses engaged in research) and nursing-focused researchers (i.e., research scientists who are not necessarily nurses, but study nursing related issues) should be systematically grown and supported to sustain future nursing science.

**Infrastructure Priority 1: Develop the VA nursing data infrastructure.**

* + - **GOAL:** Create and house a data repository with clean and consistent data on the nursing workforce and nursing practice to be used in research, implementation, quality improvement, and evaluation.
* **Objective 1:** Improve data interoperability.
  + The first aim is to improve the capacity to conduct nursing science as currently VA nursing datasets are not interoperable. To achieve interoperability, datasets need to be cross walked with standardized location/group naming conventions aligned with the ONS “Nursing Unit Mapping Application” (NUMA). NUMA is ONS’ standard approach to identify nursing units and currently few VA datasets are mapped to NUMA. Examples of data sets not currently mapped to nursing units include the Bed Management Solution (BMS), Bar Code Medication Administration (BCMA), and the All-Employee Survey (AES), among others. Please see Table 1 for other data sources and their uses related to nursing.
  + The second aim is to improve the quality of analyses on nursing by improving the granularity of data analyzed. For example, understanding trends at the unit-level rather than the hospital-level is a priority for future research, but data needs to be improved to support such analyses. Data linked to the patient and nurse, in addition to the unit, would enhance VA’s ability to address many topics in the VA Nursing Science Agenda.
* **Objective 2:** Maintain historic copies of nursing datasets.
  + The aim is to support longitudinal analyses.
* **Objective 3:** Develop and disseminate nursing data standards.
  + The aim is to encourage consistent use of measures and other variables and to support best practices related to nursing research, implementation, quality improvement, and evaluation.
* **Objective 4:** Partner with the ONS and support targeted analyses.
  + The aim is to ensure ONS has access to their data to make informed decisions. ONS is the primary partner in this work and should have a leading role in priority setting and other decisions.

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| **Table 1. VA Nursing Data Sources** | | |
| \*This is not an exhaustive list and other data sources of relevance to nursing are encouraged. | | |
| ***Name*** | ***Description of use*** | ***Source or data owner*** |
| All Employee Survey | AES workgroup level employee satisfaction, burnout, and turnover intent. | VHA National Center for Organization Development (NCOD) |
| Bed Management Solution reports | Active, occupied, and available beds, bed type, total operating beds. | Bed Management Solutions (BMS) System |
| Corporate Data Warehouse (CDW) Production Domains | Staff and patient identifiers for linking to other CDW tables/datasets.    Time-stamped nursing activity from medication administration, notes, and vital signs | CDW |
| Human Resources | Individual staff level nature of action codes capturing staff movement for turnover calculations, occupation codes, assignment codes (for RNs only), department, highest level of education, hire date, T&L unit. | Workforce Management and Consulting (WMC) |
| Managerial Cost Accounting (MCA) System National Data Extracts (NDEs) | Ward level nursing hours by nurse role. | Managerial Cost Accounting Office (MCAO) |
| Manhours report | Nurse assignments to patients, by unit. | Facility |
| [Nosos Risk Scores](https://www.herc.research.va.gov/include/page.asp?id=risk-adjustment#:~:text=The%20Nosos%20scores%20are%20centered%20around%201.%20A,is%202.5%20higher%20than%20the%20average%20VA%20patient.) | Patient-level relative Nosos risk scores, calculated annually. | VA Health Economics Resource Center (HERC) |
| Nursing Unit Mapping Application (NUMA) | Nursing unit names, VANOD unit type, skill mix by unit and role, target NHPPD by unit, and the MAS wards, T&L units, and DSS production units linked to each unit. | Office of Nursing Services (ONS) |
| OPES Facility Complexity Model | Facility complexity level, facility ICU level score | VHA Office of Productivity, Efficiency, and Staffing |
| Staffing software | Acustaf, Careware, Clairvia, etc. | Facility and ONS |

**Infrastructure Priority 2: Grow the VA nursing science community.**

* **GOAL:** Develop and support the nursing science community to sustain future research, implementation, quality improvement, and evaluation on VA nursing.
  + **Objective 1:** Support the VA nurse scientists and nursing-focused researchers by fostering a learning community in partnership with ONS and the Nursing Research Field Advisory Committee (NRFAC).
  + **Objective 2:** Engage ONS to enable strategic decision making related to the nursing workforce.
  + **Objective 5:** Improve the uptake of evidence-based practices related to nursing and support the implementation of nursing science into operational activities.
  + **Objective 3:** Partner with COINs, QUERI Centers, etc. to provide data for research and evaluation on ONS questions of interest or those outlined in the VA Nursing Research Agenda.
  + **Objective 4:** Mentor nursing post-doctoral research fellows and early-stage investigators on nursing related research, implementation, quality improvement, and evaluation.
  + **Objective 4:** Partner with external (non-VA) experts on nursing research related to workforce or practice issues. This could involve collaboration or consultation with research centers, subject matter experts, or others.