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Spheres of influence...Clinical nurse specialists

Sparking economic impact, innovative practice

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American healthcare poses countless diverse and complex issues, and the clinical nurse specialist (CNS) role is key to unlocking these challenges. The most impactful areas for CNSs relate to improving quality core measures and nurse-sensitive indicators, which may also include research on the clinical effectiveness and outcomes of treatment interventions and protocols.[1] The CNS's reach is extensive, leading initiatives that impact quality measures identified by the Centers for Medicare and Medicaid Services (CMS) in inpatient hospitals, long-term-care facilities, home health, and other patient care settings.[2]

The Institute of Medicine's *Future of Nursing Report* identified key nurse-led changes or innovations, including new practice models, strategies for more efficient use of nurses' time, nurse navigators for elder care, improved design of workforce processes, redesigned care teams led by nurses, and increased use of technology.[3,4] While leading change within his or her healthcare organization, the CNS is equipped to manage complex conditions, coordinate care with other healthcare professionals, and improve quality.[3] Applying transformational leadership, mentoring, research, and evidence-based practice, the CNS engages frontline nurses and interdisciplinary teams to achieve optimal patient outcomes.[2]

In the face of compelling fiscal limitations, increasingly complex patient populations, and changing regulatory requirements, our 703-bed, tertiary care, university-affiliated, Level I trauma center has invested in a 10-member CNS team to promote nursing excellence.

Background/role development

The CNS—an advanced practice RN who has a graduate degree concentrating on the CNS role—is an expert clinician certified in a specialized area of nursing practice. CNS specialty areas can be populations, settings, disease or medical subspecialties, types of care, or patient problems. The CNS provides both direct and indirect patient care by influencing outcomes through

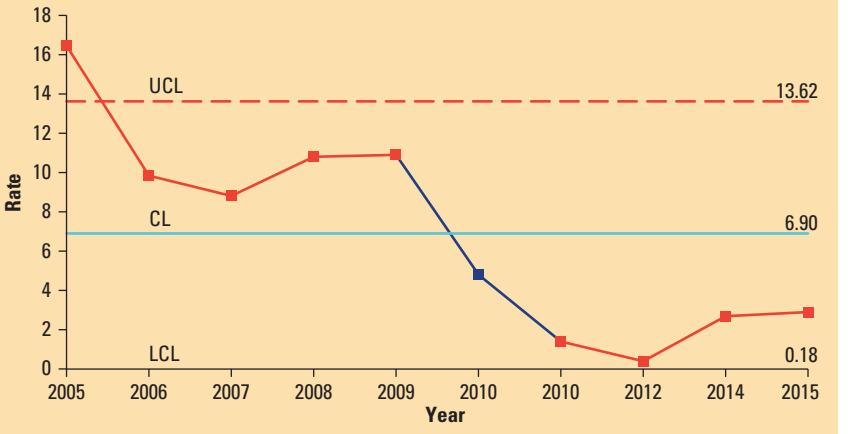
expert consultation; implementing improvements in healthcare systems; and serving as an educator, leader, and researcher.[6]

The first CNS educational program was developed in the 1950s, with the intention of returning an expert nurse to the bedside as care became increasingly complex. The CNS role was recognized as an option for nurses who desired professional advancement in clinical practice without moving into management or education.[7] Traditional functions of the CNS include clinical practice, education, consultation, research, and management.[7] More specifically, CNS practice is described within three spheres of influence: patient, nurses/nursing practice, and organization/system.[5]

Patient sphere of influence

The basis for practice in the patient sphere, which is the main focus of CNS practice, is clinical expertise directed toward managing patient outcomes to improve quality and provide cost-effective care.[5] Two specific examples include ventilator-associated pneumonia (VAP) and readmissions.

Figure 1: VAP rate, 2005-2014

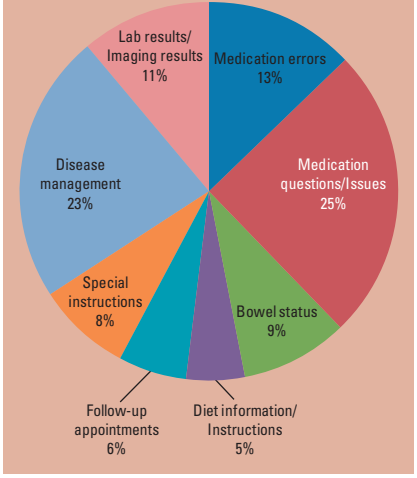


• **Decreasing VAP rates**. At our center, mechanically-ventilated adult patients receive care primarily in seven adult ICUs. An interdisciplinary VAP prevention team first convened in 2005 to address high rates. Although the team experienced some early success through implementation of a prevention bundle, the need to intensify efforts was clear by 2009. The Pulmonary CNS assumed leadership and promptly expanded the team to include front-line nurses, respiratory therapists, physicians, pharmacists, infection preventionists, and administrators. To decrease VAP rates, elements beyond those in the traditional VAP bundle were examined. Using the DMAIC (Define, Measure, Analyze, Improve, and Control) model, the team identified four key causes of the problem: (1) questionable data accuracy, (2) communication issues, (3) educational needs, and (4) lack of nursing unit ownership of VAP.

The team implemented multiple evidence-based interventions for VAP prevention. An oral care protocol and kit specifically for mechanically-ventilated patients was added. Respiratory Therapy colleagues adopted the American Association for Respiratory Care recommendation to avoid routine changing of ventilator circuits and updated their staffing ratios. In-depth evaluation of every VAP patient's care demonstrated that mechanically-ventilated patients transported both within and outside of units had increased VAP incidence. As a result, the team revised the transportation policy to require subglottal suctioning before transport and maintenance of head-of-bed elevation during transport. To decrease VAP risk during emergency intubation, a sterile towel was added to the emergency resuscitation/crash cart. Several surgical units changed practice from nasally inserted to orally inserted gastric tubes. Additionally, revision of the hospital-wide oral care policy ensured intense oral care provision for high-risk patients.

This Pulmonary CNS-led initiative resulted in VAP rate decline to an all-time low of 0.4 infections per 1,000 ventilator days. (See *Figure 1*.) This challenging journey has been well worth the effort. To date, we've saved 304 lives and avoided $25 million in costs.

Figure 2: Assistance provided during postdischarge telephone calls (n=129)



• **Reducing readmissions.** Postdischarge telephone calls made by hospital staff provide an invaluable opportunity to prevent adverse events, give health education and advice, manage symptoms, and offer reassurance. They can also be a means of evaluating hospital patient education efforts, identifying trends that may require practice improvements, and determining patient adherence with discharge instructions.[8,9]

The Gerontological CNS conducted telephone calls to 559 patients discharged to home from an Acute Care for Elders unit from January 2011 through December 2011. The calls, made 1 to 3 days postdischarge, afforded the opportunity for medication corrections, appointment verification or notification, addressing disease-specific questions, and promoting patient/family satisfaction and other needs that impact decreased readmissions. Of the 559 patients called, 129 needed information or assistance. (See *Figure 2.*) Prospectively resolving issues related to prescriptions, medication administration, follow-up appointments, and facilitation of home healthcare referrals allowed the patient to transition to home and potentially reduced readmissions.[10]

Nurse sphere of influence

The nurses/nursing practice sphere reflects how the CNS influences nursing activities and actions to improve patient outcomes. These activities can be achieved through education, policy development, and evidence-based practice.[5] Two specific examples include end-of-life (EOL) care and trauma care.

• **Educating nursing staff about EOL.** To promote professional development by infusing clinical expertise into evidence-based curricula, the Palliative Care CNS implemented the End-of-Life Nursing Education Consortium (ELNEC) in 2008. ELNEC training is a 2-day program that includes nine modules of didactic and experiential learning for RNs. Additionally, we added a pediatric ELNEC training program for nurses who care for children with serious illnesses.

The CNS follows nurse participants for a year, studying their death anxiety, concerns about dying, and perceived knowledge about dying. Longitudinal data reflected that over a 5-year period, 345 RNs attended ELNEC training, with 78 participants completing all four surveys. Participants had increased perceived knowledge about dying at 2 weeks, 6 months, and 12 months ($P < 0.001$) as compared with the control group who didn't attend ELNEC. There were no statistically significant differences detected between the treatment and control groups for either death anxiety or concern about dying at any of the time periods. Interestingly, the treatment group had less death anxiety and concerns about dying at each studied interval when the raw mean scores were compared. Research is ongoing to improve patient outcomes at end of life while addressing the emotional needs of the frontline nurse.

• **Optimizing performance among trauma teams.** Bringing clinical expertise to program development, the CNS supports improved population-based outcomes through development, implementation, and evaluation of evidence-based curricula to support effective care delivery. In our Level I trauma and academic medical center, the Trauma Service CNS designed and implemented a model program for multidisciplinary trauma team training. The program's objectives target enhanced clinician knowledge, confidence in practice, and team communication as essential components of high-quality healthcare. The training structure combines the TeamSTEPPS Essentials course, an evidence-based program aimed at optimizing performance among teams of healthcare professionals, with multidisciplinary simulation-based team training (SBT), including participation by attending surgeons, surgery and emergency medicine residents, and trauma nursing staff practicing in the trauma resuscitation setting.

We demonstrated positive outcomes in team performance and improved patient safety using strategies focused on enhancing these essentials through multidisciplinary SBT. Prior to and following training program implementation, we

The CNS collaborates with frontline nurses to improve care, change practice, and stimulate research.

evaluated the performance of our trauma teams in the resuscitation setting using a validated trauma team performance observation tool based on the TeamSTEPPS framework domains (leadership, situation monitoring, communication, and mutual support). Pre- to posttraining improvements were statistically significant ($P < 0.05$) in all teamwork domains; overall team performance scores; and critical trauma efficiency outcomes, including ED dwell time and time-to-endotracheal intubation.[11] The 82 RNs attending the training demonstrated a statistically significant increase in knowledge scores from pretest ($M = 68.29$, SD = 18.35) to posttest ($M = 88.48$, SD = 5.44), t(65) = 1.997, $P < 0.0000$ (two-tailed), and significant increase in skills confidence from pre- to posttraining ($P < 0.05$).

Multidisciplinary program participants report course objectives are met (100%) and continue to recommend the training to colleagues (100%). Expansion of the model program now includes an advanced trauma nurse academy, rapid response team, and frontline RN TeamSTEPPS Master training. Since the program's inception, more than 300 healthcare professionals have received Trauma TeamSTEPPS training, with 15 TeamSTEPPS Master Trainers currently in service. Trauma study outcomes are featured in the Agency for Healthcare Research and Quality TeamStepps 2.0 (2014) Module 1: Introduction/Evidence Base.[12] Outcomes of the model program have been published and presented regionally and nationally, leading to expansion of the CNS-developed and implemented program to other state trauma centers and supporting improved quality of trauma care.

Organization/system sphere of influence

The organization/system sphere refers to hospital- or organization-wide changes brought about by the CNS that result in improved patient outcomes and cost-effectiveness. This sphere can also refer to allocation of adequate resources and development of laws or other health policies.[5] Two examples include exceeding wound reduction benchmarks and influencing system change.

The CNS directly influences improved patient outcomes; decreased length of stay, readmission rates, and costs; and higher reimbursements.

- **Outperforming benchmarks in hospital-acquired pressure ulcer (HAPU) reduction.** Each year, more than 2.5 million people in the United States develop pressure ulcers.[13] These skin lesions are associated with increased pain, infection risk, and longer length of stay at higher costs. In 2007, the CMS began denying reimbursement for payments to treat pressure ulcers that developed after hospital admission, which increased the financial risk for hospitals unable to maintain low rates.[14] In 2006, more than 90% of pressure ulcer-related adult hospitalizations listed pressure ulcers as a secondary diagnosis, rather than the primary reason for admission.[15] Patients admitted with a primary pressure ulcer diagnosis have a longer length of stay than those with a secondary diagnosis (14.1 days versus 12.7 days), and nearly three times longer than those with no pressure ulcers (14.1 days versus 5.0 days).[16] In another study, 4.5% of 51,842 subjects developed at least one new HAPU during hospitalization (CI 95%, $P < 0.001$), which was linked with significantly higher in-hospital mortality (11.2%) and mortality within 30 days postdischarge (15.3%). Patients who developed HAPUs during hospitalization were more likely to die during the hospital stay, have a longer length of stay, and be readmitted within 30 days of discharge.[17]

Regulatory and reimbursement changes made it imperative for hospitals to build programs aimed at decreasing HAPU rates. Before the new regulations, our medical center had been unable to impact the HAPU rate to meet national benchmarks after implementing several evidence-based best practice prevention standards. In 2008, HAPU rates averaged 12% to 35%, significantly higher than other benchmarked hospitals within the National Database of Nursing Quality Indicators.® Following a SWOT (Strength, Weaknesses, Opportunities, Threats) analysis, the Wound Care CNS led the HAPU prevention initiative, tapping her unique education, content expertise, and knowledge to influence organization-wide change. After rollout of the Wound Care CNS position and 3 years of aggressive implementation of

evidence-based interventions for pressure ulcer prevention, the CNS and the wound care team have significantly reduced overall HAPU prevalence rates that consistently outperform the national benchmark, with an average rate of less than 1.5%. (See *Table 1*.)

• **Mentoring and role modeling for system change.** The CNS is a frontline nurse mentor. Our three-time Magnet®-designated hospital has developed a strong program dedicated to engaging and mentoring frontline nurses in research, and we devise strategies that generate passion and commitment for this dimension of professional nursing practice. Lack of time, knowledge, funding, and experience are just a few of the challenges for frontline nurses seeking to participate in nursing research. In addition, most frontline nurses are prepared at the associate- or bachelor's-degree level and have little or no background with conducting research. Clinical questions, although abundant, may go unrecognized by nurses who are research-naive. The CNS is well positioned to help identify questions and provide research mentoring.

Our Cardiac Surgery CNS designed an Institutional Review Board-approved research study using a prospective, randomized controlled trial design to explore best practice for poststernotomy dressings. With the support of 12 frontline nurses and nurse managers from presurgical testing, OR, CCUs, and progressive care units, the statistically powered sample included 315 consented patients over 2 years. This recently published research, directed and supported by the CNS, was possible only through teamwork, daily effort, and successful engagement of managers and coworkers.[18]

Table 1: HAPU average cost per stay

Year	Average # of monthly HAPU	Average # of yearly HAPU	Estimated cost of full-thickness HAPU	Estimated yearly cost of full-thickness HAPU (in millions)
2008	36	432	$37,800	$16.3
2009	29	348		$13.2
2010	25	300		$11.3
2011	18	216		$8.2
2012	6	72		$2.7
2013	5	60		$2.3

A practice change was implemented as a direct result of the research. Nurse participants were engaged throughout the process. As one study nurse said, "This was a valuable opportunity: I feel empowered!" Six nurses from study units recently completed our nursing research fellowship program and several have presented posters at national conferences. Frontline nurses now recognize the importance of nursing research, with the CNS as a consistent resource and mentor. Nursing research takes a village; this project was a successful way to grow frontline nurses to engage in research.

Intertwining spheres of influence

The Cardiology CNS played a major leadership role in the development, implementation, and ongoing oversight of a multidisciplinary therapeutic hypothermia program. The CNS was a key player in our facility's adoption of this international initiative and lifesaving treatment. The CNS provided significant contributions through design of the supportive infrastructure, education and achievement of buy-in, and ongoing monitoring and follow-up.

In designing the project's support system, the CNS completed an extensive literature review and provided structured benchmarking with multiple facilities that offered this treatment. She identified cooling device vendors and led the initial review of equipment features, costs, and user satisfaction. She played a key role in collaborating with team members to develop the inclusion criteria, policy, documentation tools, physician order set, and family education brochure. Educating physicians, residents, and frontline nursing staff on published postresuscitation care guidelines and research has garnered advocacy for and acceptance of this time-sensitive treatment. The CNS led the development of process and outcome indicators, and she continues to track these elements.

By following each patient, the CNS intervenes in the care of individuals and detects population trends requiring modifications in structure and process. For example, the CNS identified that the initial shivering management protocol resulted in delays in cooling. Based on literature review and pharmacy collaboration, revision in the order set resulted in faster cooling and fewer medications that negatively impact assessment of neurologic recovery. Since 2010, we've treated 192 patients, with 38.5% achieving good neurologic outcomes and a return to previous health, consistent with success rates reported in the literature.[19-21]

From evidence to practice

The CNS is in a unique position to implement change that improves patient and quality outcomes. As an advanced practice RN, the CNS impacts overlapping spheres of influence: patient, nurse, and organization. The CNS is an expert clinician, researcher, consultant, innovator, and educator, who collaborates with frontline nurses to improve care, change practice, and stimulate research.

Our facility supports nine CNSs, but even a single one at a smaller system can transform nursing practice. No matter the setting, organizational size, or population served, employing a CNS will benefit patients, nurses, and the organization. Change agents at all levels, the CNS embodies the unique ability to work throughout the healthcare system.

The CNS directly influences improved patient outcomes; decreased length of stay, readmission rates, and costs; and higher reimbursements. The examples we shared in this article have saved our organization millions in cost-avoidance and even more in reduced hospital-acquired morbidity. Although each specialized practice is developed uniquely, some CNS practices are able to provide billable services.

High cost in the context of poor quality can no longer be sustained and care providers are compelled to contribute to quality patient outcomes. The CNS translates evidence into practice, impacting length of stay and care cost.[22] As a systems expert, the CNS provides leadership to internal and external stakeholders, working with consumers, healthcare executives, and legislators to advance community health. The CNS contributes to population-based initiatives, impacting positive social change.[23] The CNS's unique skillset is invaluable to addressing our nation's complex health issues. NM

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