ICU MANAGEMENT & PRACTICE

Tele-Critical Care Nursing: The Well-Established Predecessor of Today's Virtual Nursing

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Cited more than 100 times in other publications, *A Second Set of Eyes: An Introduction to Tele-ICU* was published by Susan Goran in 2010 (Goran 2010). Goran described "the tele-ICU is that 'second set of eyes' that provides additional clinical surveillance and support". She went on to explain how inadequate nurse staffing was "linked to medication errors, increased risk of pneumonia and reintubation, and increased lengths of stay with higher complication rates". Unfortunately, lack of knowledge and experience continue to plague nursing as major contributors to high error rates that lead to patient harm, moral distress, and subsequent nurse turnover (Halm 2019; Schlak et al. 2021).

Recent data from the United States (U.S.) Bureau of Labor Statistics projects that the registered nurse job rate is expected to grow 6% from 2021 to 2031, with about 203,200 RN job openings each year, on average, over the next ten years. Ensuring the knowledge and experience of the nurse match the needs of the patient (Synergy Model 1998) (Curley 1998) is not a new problem, but amid a nursing shortage, the difficulty of achieving it is intensified. Expert nurses are equipped with situational awareness and pattern recognition to evaluate, analyse, and interpret patient adaptive responses to targeted therapeutic interventions that must be executed moment-by-moment (Benner et al. 2011). Telehealth technologies can be used to disperse expert nurses across multiple care areas in more efficient and cost-effective ways.

While Goran (2010) described the role of Tele-ICU (now referred to as tele-critical care) nurses in 2010, a modified Delphi approach was used by researchers in 2016 to rank 15 priority areas of care for tele-critical care nurses, including critical thinking skills, intensive care experience, skilful communication, mutual respect, and management of emergency patient care (Kleinpell et al. 2016). Others publishing about surveillance within the realm of tele-critical care nursing described it as the ongoing interpretation, synthesis, and analysis of individual patient or population data with the purpose or goal of supporting clinical decision-making (Rincon and Henneman 2018). As mentioned by Goran (2010), tele-critical care nurses were some of the first *virtual nurses* to conduct best practice, deterioration, and sepsis surveillance (Goran 2010; Rincon et al. 2011; Zapatochny 2009). They can also assist with tasks that do not require physical proximity to the patient, such as assisting with patient family education, completing admission and discharge tasks, participating in two-person verification processes, mentoring/coaching novice nurses, acting as evidence-based practice translators, guiding nursing practice patterns (Kleinpell et al. 2016; Rincon and Henneman 2018; Welsh et al. 2019; Williams et al. 2012; Williams et al. 2019; Rincon 2012). Although most accounts in the literature describe virtual teams working together within a centralised location, some health systems modified workflows during the pandemic. The resulting decentralised staffing models used work-from-home solutions to support better social distancing for virtual nurses and expansion of the pool of available expertise (Arneson et al. 2020).

Virtual nurses use telecommunication, electronic health records (EHR), health information systems (HIS), clinical decision support and other tools and technologies to extend their practice across geographical boundaries to care for patients wherever they are located and support the care teams providing hands-on care. Whether using audio-video solutions on mobile carts or wall-mounted systems, integrated high-definition television endpoints, or handheld mobile technologies (tablets, smartphones), virtual nurses communicate and collaborate with fellow care team members over any distance. Features that enhance virtual nurse practice capabilities include:

1. pan, tilt, and zoom cameras with 2-way audio and video functionality
2. night vision (infrared) capabilities
3. hardwired, Wi-Fi, or 5G connectivity functionality
4. touch screen or button alerting to request support
5. technologies that support including other clinicians and care providers, family members, interpreter services, and other support personnel into video sessions
6. remote access to electronically stored patient information and clinical documentation (EHR and other health information systems)
7. secure messaging platforms and tools
8. remote proactive monitoring/management of streaming data, clinical decision support tools, biomedical device alerts, and EHR best practice advisories.

The American Association of Critical-care Nurses' (AACN's) Tele-critical Care Nursing Practice: An Expert Consensus Statement Supporting Acute, Progressive and Critical Care provides recommendations, clinical vignettes, and a framework to assist organisations in implementing and evaluating this evolving practice. It identifies and articulates essential elements based on current evidence and provides real-world examples in the form of clinical vignettes for each key recommendation. The tele-critical care nursing model provided within this consensus statement is the archetype used to develop innovative virtual care workflows. It lays the foundation for what is now referred to as "virtual nursing". More broad adoption of virtual nursing programmes built on this model will lead to a stronger nursing workforce.

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