The Role of Health Care Technology in Support of Perinatal Nurse Staffing

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ABSTRACT

Health care technology can generate massive amounts of data. However, when data are generated from disparate, uncoordinated systems, using them to make decisions related to staffing can be a challenge. In this article, I describe the importance of data standardization, system interoperability, standard terminologies that support nursing practice, and nursing informatics expertise as tools for improving the usefulness of electronic systems for informing staffing decisions.

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More than 90% of U.S. hospitals have now implemented electronic health record systems (Office of the National Coordinator [ONC] for Health IT, 2013). The impetus for widespread adoption of health care information technology (HIT) has been the incentives offered through the Centers for Medicare and Medicaid Services (CMS) for implementing meaningful use of HIT. To demonstrate meaningful use, health systems and care providers must attest that the HIT solutions they install meet certain defined criteria, including computerized provider order entry (CPOE), reporting of quality metrics, data sharing ability, and consumer access to their own electronic health information (ONC for Health IT, 2013). Widespread HIT implementation means that the amount of data entered into HIT systems is exploding.

In perinatal settings, bedside nurses and nursing administrators are navigating the complexities of the perinatal nursing environment and uncoordinated HIT systems (see Figure 1). Perinatal nursing units may have one system for fetal surveillance and archiving and another for documentation. The prenatal record may come from a third system. Laboratory, radiology, and medication information may be hard to find and harder to incorporate into an overall picture of the woman and her fetus or newborn, yet these data are essential to formulate a plan of care. Such complexity may require double documentation and even a mix of manual and electronic documentation methods. Further, HIT departments may successfully advocate for abandonment of perinatal specific HIT systems, known as "best of breed" systems, in favor of an enterprise-wide, single HIT solution. Enterprise-wide solutions may not address the specific documentation needs of the perinatal population and may not interface with the fetal surveillance and archiving system. Such complexities make data retrieval difficult and translation of data into useful information burdensome.

In terms of staffing in perinatal units, in 2010, the Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN) published revised guidelines for registered nurse (RN) staffing. Since that time, AWHONN has been actively engaged in research related to the effectiveness and efficiency of perinatal staffing. A wealth of data exists in perinatal documentation systems that could inform such research, but the complexity of perinatal HIT makes data retrieval cumbersome. The purpose of this article is to briefly summarize the current state of research methods used to assess staffing efficiency and effectiveness and to

Complexities in the perinatal medical record make data retrieval difficult.

examine actual and potential data sources for common nurse, patient, and system factors, or principles that are considered in the context of principle-based staffing decisions. The American Nurses Association (ANA, 2012) suggested applying such principles for the purpose of determining "appropriate nurse staffing," defined as

> A match of registered nurse expertise with the needs of the recipient of nursing care services in the context of the practice setting and situation. The provision of appropriate nurse staffing is necessary to reach safe, quality outcomes; it is achieved by dynamic, multifaceted decision-making processes that must take into account a wide range of variables. (p. 6)

Technology can be an important partner in staffing decision making. I present recommendations for making HIT a useful tool to generate real-time evidence related to the effectiveness and efficiency of perinatal nurse staffing.

Principle-based Staffing

Common Variables Used in Staffing Research

The relationship between RN staffing and patient outcomes is a much-studied phenomenon. However, rather than equating specific nursing interventions to corresponding patient outcomes, most researchers have focused instead on variables such as the numbers of RN full-time equivalents (FTEs) per patient day, the ratio of the number of patients per RN, and/or the number of nursing hours per patient day (HPPD) with outcomes such as mortality, patient falls, pressure ulcers, infection, and failure to rescue (Kane, Shamiliyan, Mueller, Duval, & Wilt, 2007). Staffing numbers and nursing hours per patient day are commonly reported to the National Database of Nursing Quality Indicators (NDNQI) as well as to benchmarking organizations and are either self-reported or relatively easy to obtain from large administrative databases. Administrative databases may be problematic in that they may not distinguish inpatient from outpatient staffing, which can
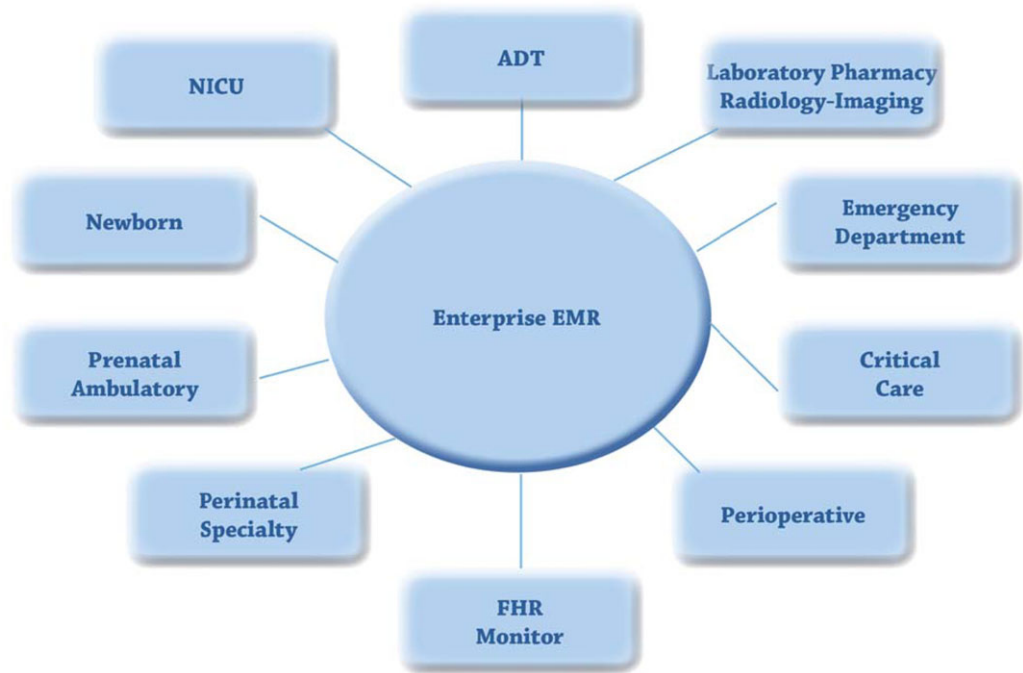

Figure 1. Possible components of perinatal setting system architecture. From McCartney, P., & Barnes, J. (2012). *Perinatal nursing informatics guide for clinical health information technology*. Washington, DC: Association of Women's Health, Obstetric and Neonatal Nurses. Figure 2.2, p. 33. Used with permission of AWHONN.