Predicting Nurse Staffing Needs for a Labor and Birth Unit in a Large-Volume Perinatal Service

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ABSTRACT

This project was designed to test a nurse staffing model for its ability to accurately determine staffing needs for a large-volume labor and birth unit based on a staffing gap analysis using the nurse staffing guidelines from the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN). The staffing model and the AWHONN staffing guidelines were found to be reliable methods to predict staffing needs for a large-volume labor and birth unit.

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There are many challenges in planning and budgeting for registered nurse (RN) staffing for perinatal units and in predicting the correct number of nurses to meet the routine needs of the service. These challenges vary with size, volume, location, acuity, patient population, model of care, and unit configuration. Further, clinical practices of individual providers, such high rates of cesarean births, can significantly influence length of stay (LOS) and the number of nursing hours needed to provide safe and effective perinatal care (Simpson, 2010).

Fiscal practicality demands appropriate nurse staffing consistent with budgeted productivity targets that are developed based on realistic goals and patient safety. Appropriate staffing is not static; the immediate needs of the unit must serve as an indicator of when to increase or reduce staffing. Ideally, staffing needs are assessed periodically throughout each shift, and adjustments are made as situations change. On-call systems can work well to adapt to fluctuations in census and acuity, however they are not always feasible in small-volume services. The process used to determine and respond to staffing needs must rely on more than just numbers and often includes the experience level of the staff (Tillett, 2009). Often nurses on the day shift and on the night shift have significantly different levels of experi-

ence, as seniority tends to be a driver of being assigned to the day shift. Having a disproportionate number of new graduates and nurses with minimal intrapartum experience must influence decisions about how many nurses are assigned to the night shift and what type of skills and years of experience are required of the other nurses who will be assigned to work alongside them.

Baseline staffing needs can be predicted based on a comprehensive knowledge of the clinical experience of nurses, typical patient characteristics, workflow, and provider practices. Realistic productivity goals are enhanced with objective data on unit experience, trends, and ongoing processes to assess routine practices for quality and efficiency. These types of data are essential for members of the nursing leadership team to generate accurate predictions of staffing needs.

The majority of perinatal services in the United States have birth volumes that are conducive to a unit configuration with rooms that accommodate labor, birth, recovery, and mother/baby care without transferring women during the course of hospitalization. In this setting, nurses often, but not always, provide care to women in all phases of the childbirth process. Approximately 2,250 (69%) of the 3,265 perinatal units in the United States

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have fewer than 1,500 births, which is generally considered the upper limit of volume that can efficiently be accommodated by the single room maternity care model (Simpson, 2011).

As birth volume increases, so does the likelihood of separate labor and birth (L&B) and mother/baby units. Many of the larger volume perinatal units also have separate antepartum units for women with pregnancy complications who require inpatient care but who are not anticipated to give birth imminently. No data are available on how many units have separate antepartum units, however, very large volume units (≥5,000 births) are more likely to. Very large volume perinatal services make up only a small percentage ($n = 85$, ~2.6%) of all U.S. perinatal services, but they are responsible for an estimated 641,000 births or approximately 15% of all U.S. births (Simpson, 2011).

The Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) published *Guidelines for Professional Registered Nurse Staffing for Perinatal Units* in 2010. These guidelines were developed based on a review of recommendations, standards, and guidelines for clinical practice from other professional organizations and regulatory agencies, available evidence, and expert opinion. Suggested nurse-to-patient ratios are offered for various aspects of nursing care provided during labor, birth, and the immediate postpartum period, as well as for obstetric (OB) triage and mother-baby care (AWHONN, 2010).

In 2010, before the AWHONN (2010) staffing guidelines were published, Wilson and Blegen (2010) proposed a model for calculating nursing hours needed for all of the activities intrapartum nurses usually provide. The model applied to perinatal services with separate L&B units, that is, large-volume services. The purpose of this article is to describe the process of testing this model for its ability to accurately determine staffing needs for a L&B unit with approximately 8,000 births per year by comparing the results with the number of nurses estimated to be needed based on a staffing gap analysis using the staffing guidelines from AWHONN.

Background

Productivity standards in hospitals are often measured in hours per patient day (HPPD) that are calculated by patient census at midnight. This approach may work for medical-surgical units but is not well suited to perinatal units due to the dynamics of changing acuity related to labor, birth, and recovery, varied throughput and frequent turnover of patients (including women presenting to triage, women transferring between units, and women being discharged), volume surges, clustering of elective procedures, unplanned cesareans, and the general unpredictable nature of childbirth. These unique aspects of perinatal nurse staffing reflect the complexity of caring for the current obstetric and neonatal patient populations (Miller, 2012).

Other methods for calculating nursing hours include designation of a specific number of nursing hours earned per birth. This method has limitations, including lack of accurate consideration of the nursing time spent with women who present for OB triage and are discharged, women with pregnancy complications who have extended LOSs before giving birth, women receiving antepartum testing such as nonstress tests (NST), women receiving obstetric care and monitoring on a nonobstetric unit, and surgical procedures that do not involve birth, such as postpartum tubal ligation, cerclage placement, percutaneous umbilical blood sampling (PUBS), and dilation and curettage (D&C). The model proposed by Wilson and Blegen (2010) appeared to blend the best of both methods (HPPD and hours per birth) but required precise data relative to many of aspects of care provided by nurses in a L&B unit to apply its components to a specific staffing budget.

This project was conducted in a large-volume L&B unit with approximately 8,000 births per year based on 2012 data. In 2011 and 2012, substantial preparation occurred in anticipation of a move to a new L&B unit in a new hospital tower in early 2013. In the previous unit, OB triage, labor, birth, and recovery processes occurred on the same floor. The new unit is much larger with OB triage on the first floor, labor rooms and one cesarean birth room on the sixth floor, and labor rooms and a perioperative unit on the seventh floor. As part of the plan for the new unit, the nursing leadership team wanted to ensure that there were enough nurses to meet the needs of the service and to make every effort to meet the AWHONN (2010) staffing guidelines. The model suggested by Wilson and Blegen (2010)