

## Is Birth Timing Associated with Type of Practice?

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### Abstract

**Objective:** The purpose of this study was to evaluate whether timing of vaginal births at a tertiary care center differed between academic and private practices.

**Methods:** Vaginal births of singletons and first twins occurring at our tertiary care facility from January 1, 2008, to December 31, 2011, were reviewed. Deliveries were grouped into two practice types: academic and private. Delivery times were categorized as daytime, defined as 0800 to 2000, and nighttime, defined as 2000 to 0800. Chi-square tests assessed associations between practice type and timing of deliveries.

**Results:** During the three-year timeframe, 9,766 vaginal deliveries were included. Of those, 5,889 were delivered by academic practitioners and 3,877 by private practitioners. More vaginal deliveries occurred during daytime hours than nighttime hours. The proportion of daytime to nighttime deliveries was significantly different ( $P < .001$ ) among private practitioners, whose deliveries mostly occurred during daytime hours, compared to academic practitioners, whose deliveries occurred equally day and night. The majority of deliveries occurred during weekdays for both academic and private practices, however, there were proportionally fewer private practice deliveries on the weekend than academic ( $P < .002$ ).

**Conclusion:** More vaginal births occurred during the daytime and on weekdays in our tertiary care center. This distribution differed significantly between private and academic practices. Knowledge of these patterns can be beneficial to hospitals and practices in scheduling staff and anticipating workloads for specific times of day and days of the week.

### Precis

More vaginal births occur during the daytime and on weekdays in our tertiary care center, with the distribution differing significantly between private and academic practices.

### Introduction

Birth timing, or the time of day at which a birth occurs, may influence staff scheduling needs in labor and delivery units. Appropriate staffing levels require insight into the patterns of birth timing. Previous analyses of vaginal birth timing have evaluated the impact of the time of day, day of the week, and time of labor induction. While women are more likely to deliver in the early afternoon [1,2], there is no association with a specific day of the week [1]. There is also no evidence of differences in length of labor between morning and evening inductions [3].

The question was raised whether the timing of vaginal births has a pattern, and if so, whether that pattern relates to physician practice type. Academic practices often maintain continuous in-hospital coverage compared to at-home call for private practices. Both practice types would have patients enter labor spontaneously, however, timing of inductions would likely be scheduled differently for academic and private practices based on the anticipated presence of the on call physicians. An academic practice whose providers constantly staff the hospital may begin inductions at any time of day, whereas private practice providers may schedule inductions such that deliveries are more likely to occur when they are anticipating being in the hospital. Therefore, it was hypothesized that type of practice would influence birth timing.

### Methods

Following approval by the University and Medical Center Institutional Review

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Board, all births occurring in the labor and delivery unit at Vidant Medical Center between January 1, 2008, and December 31, 2011, were reviewed. Cesarean deliveries, intrauterine demises, and pre-viable deliveries were excluded. Vaginal deliveries of second twins were also excluded as their timing was inherently linked with delivery of the initial twin. Data were collected from unit delivery logs and electronic medical records and entered into a secure Excel database. Data included date and time of delivery as well as the delivering practice. Deliveries were grouped into two practice types: academic and private. Delivery times were categorized as daytime, defined as 0800 to 2000, and nighttime, defined as 2000 to 0800. Using the Number Cruncher Statistical System (NCSS) 2007, chi-square tests were performed to assess associations between practice type and timing of deliveries. Results were considered significant when P values were <.05.

### Results

During the three-year timeframe of our study, we identified 9,766 vaginal deliveries that met our inclusion criteria. Of those, 5,889 were delivered by academic practitioners and 3,877 by private practitioners. More deliveries occurred during the day than at night (see Figure 1). The proportion of daytime to nighttime deliveries was significantly different ( $P<.001$ ) among private practitioners, whose deliveries mostly occurred during daytime hours [2,156 (56%) versus 1,721 (44%)], compared to academic practitioners, whose deliveries occurred equally day and night [2,947 (50%) versus 2,942 (50%)] (see Figure 2). The majority of deliveries occurred during weekdays for both academic and private practices, however, there were proportionally fewer private practice deliveries on the weekend than academic ( $P<.002$ ) (see Figure 3). Twenty-seven percent of

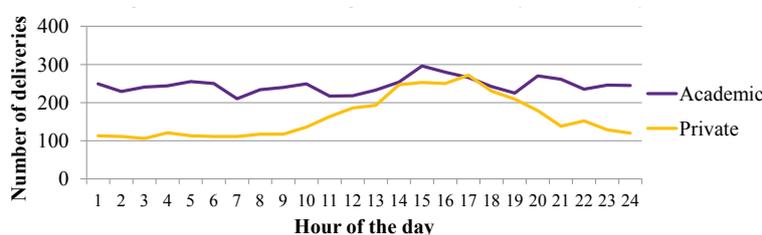


Figure 1: Number of vaginal deliveries by time of day.

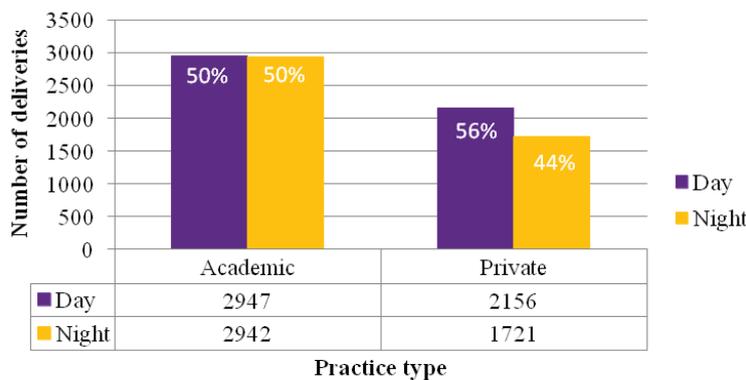


Figure 2: Day versus night deliveries.

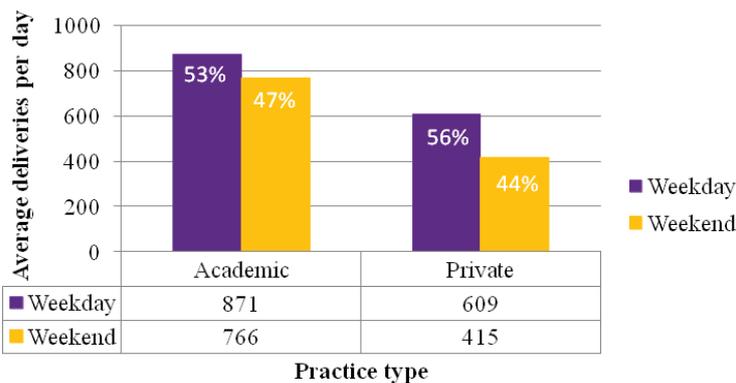


Figure 3: Weekday versus weekend deliveries.

academic patients delivered during the weekend versus 21% of private practice patients.

## Discussion

Vidant Medical Center houses three private obstetric practices in addition to both obstetric and family medicine academic practices. Because this academic center is also the tertiary referral destination for twenty-nine counties in eastern North Carolina, it was anticipated that more deliveries would be performed by the academic practices. The hypothesis that type of practice would influence birth timing was confirmed. Women delivered by an academic practice in this study were equally likely to deliver during the day as at night, whereas women delivered by a private practice were more likely to deliver during the day.

There are two potential explanations for these results. The first assumes inductions occurred more often in the academic practices due to unscheduled medical indications than in the private practices. Prior research of spontaneous labor has demonstrated that natural births are more likely to occur during the day [1,2]. Therefore, if the majority of private practice patients entered labor spontaneously, more daytime deliveries would be expected as shown by the data. If this assumption is true, deliveries should occur at a similar rate on the weekend. However, in this study more vaginal deliveries occurred on weekdays than on weekends.

An alternative explanation assumes that inductions occurred at similar rates in the two types of practices. In light of this assumption, the data would suggest that private providers scheduled inductions such that deliveries occurred when they were already in the hospital, whereas academic providers who constantly staffed the hospital began inductions at any time of day.

A limitation in this study is the inability to differentiate between deliveries that occurred spontaneously and those that occurred as a result of induction. While the hypothesis was proven, this additional information would better illustrate how the type of practice influences birth timing.

More vaginal births occur during the daytime and on weekdays in our tertiary care center. This distribution differs significantly between private and academic practices. Knowledge of these patterns can be beneficial to hospitals and practices in scheduling staff and anticipating workloads for specific times of day and days of the week.

## References

1. Anderka M, Declercq ER, Smith W. A time to be born. *Am J Public Health.* 2000;90(1):124-126.
2. Mancuso PJ, Alexander JM, McIntire DD, Davis E, Burke G, Leveno KJ. Timing of birth after spontaneous onset of labor. *Obstet Gynecol.* 2004;103(4):653-656.
3. Bakker JJ, van der Goes BY, Pel M, Mol BW, van der Post JA. Morning versus evening induction of labour for improving outcomes. *Cochrane Database Syst Rev.* 2013;(2).