

# Nurse-Related Clinical Non-licensed Personnel in U.S. Hospitals and Their Relationship with Nurse Staffing Levels

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**Background:** Hospitals use non-licensed personnel to help perform tasks under the supervision of registered nurses (RNs) or other licensed clinical providers, and in so doing, help manage professional shortages and reduce costs. The delegation of specific tasks to nurse-related clinical non-licensed personnel (CNLP) presumably allows nurses to focus on more complex situations. Little is known, however, about whether RN staffing may decline as CNLP staffing increases, or visa versa. This study examines the question of whether and to what extent CNLP staffing levels and nurse staffing levels complement or substitute to each other.

**Objective & Research Questions:** The study objective was to examine the relationship between CNLP, RNs, and licensed practical nurses (LPNs) in U.S. hospitals between 2010 and 2014. We asked: What changes occurred in staffing levels and skill mix for each nurse-related CNLP job in 2014? Did RN, LPN, and CNLP hospital staffing change from 2010 to 2014? Did CNLP staffing substitute to RN and LPN staffing over time?

**Data:** 2010-2014 administrative data obtained from the OperationAdvisory® database maintained by Premier, Inc., including staffing information such as labor hours, expenses, skill-mix category, occupation, and facility characteristics.

**Study Sample:** 523 hospitals over the study period, after excluding hospitals with missing staffing information. This sample covers health care systems in all 50 states and the District of Columbia.

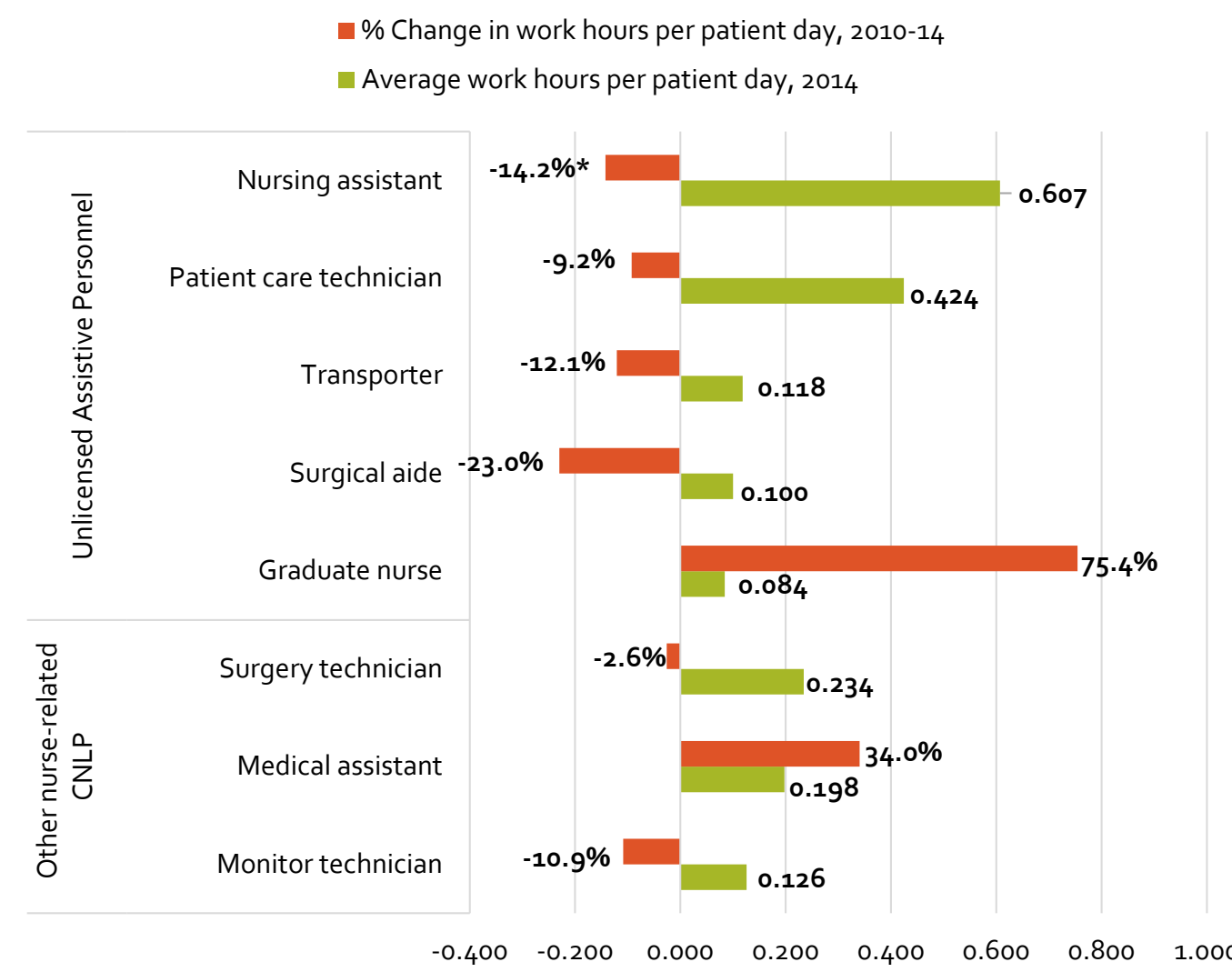
**Identification and Categorization of Nurse-Related CNLP**

5 *Unlicensed Assistive Personnel* jobs that are delegated and supervised by licensed nurses (nursing assistants, patient care technicians, transporters, graduate nurses, and surgical aides), and 3 *other non-licensed jobs* that are not supervised by nurses, but for whom nurses general fill in when they are absent or understaffed (medical assistants, monitor technicians, and surgery technicians).

**Dependent Variable:** Number of nurse-related CNLP labor hours in a given hospital-year

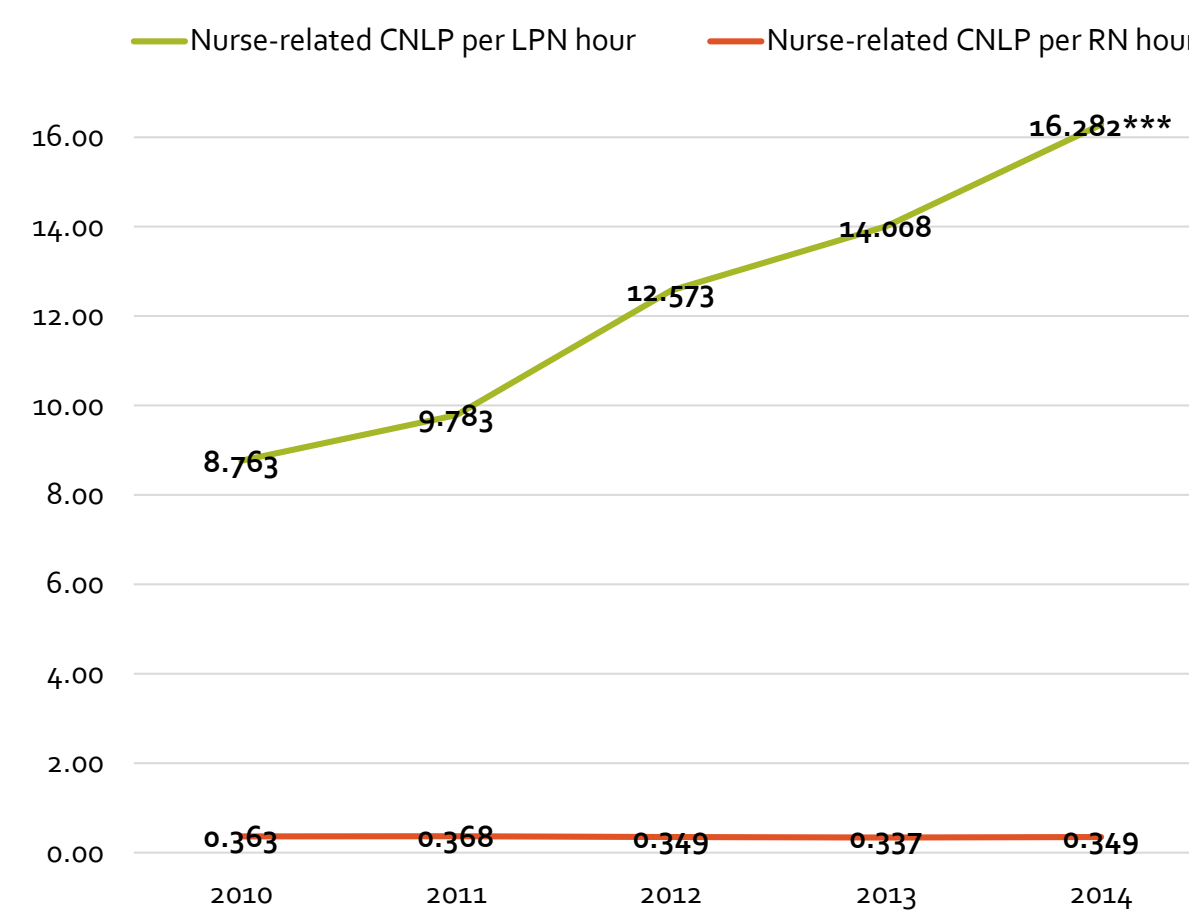
**Independent Variables:** Number of LPN and RN labor hours fully interacted with 5-year dummies (2010–2014), respectively.

**Figure 1. Average Number and Percentage Change in Hours Per Patient Day for Each Nurse-Related CNLP Job in U.S. Hospitals, 2010-14**



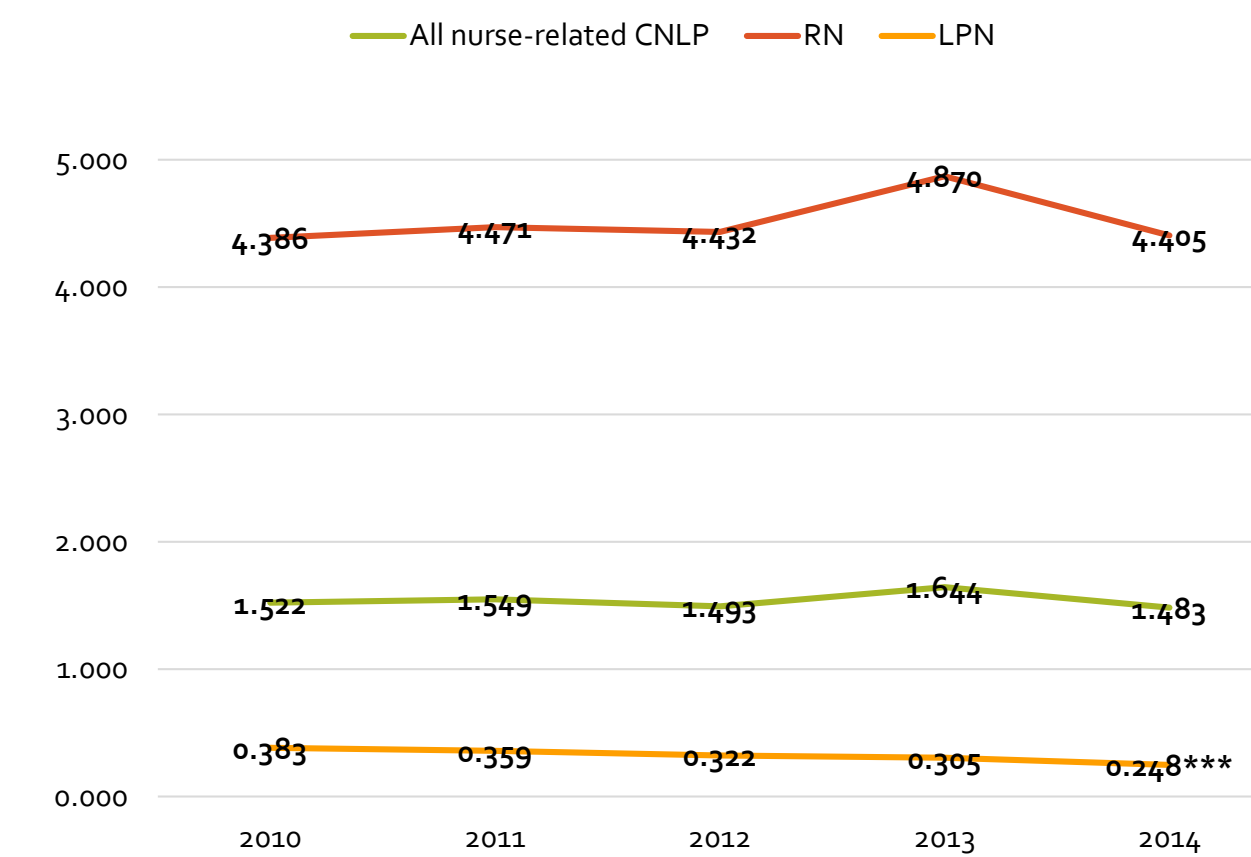
Notes: Average work hours per patient day were calculated at the hospital level and averaging across hospitals. \* represents statistical differences in ratios between 2010 and 2014. \*p<.5

**Figure 3. Ratios of All Nurse-related CNLP to RN and LPN Median Hour in U.S. Hospitals, 2010-2014**



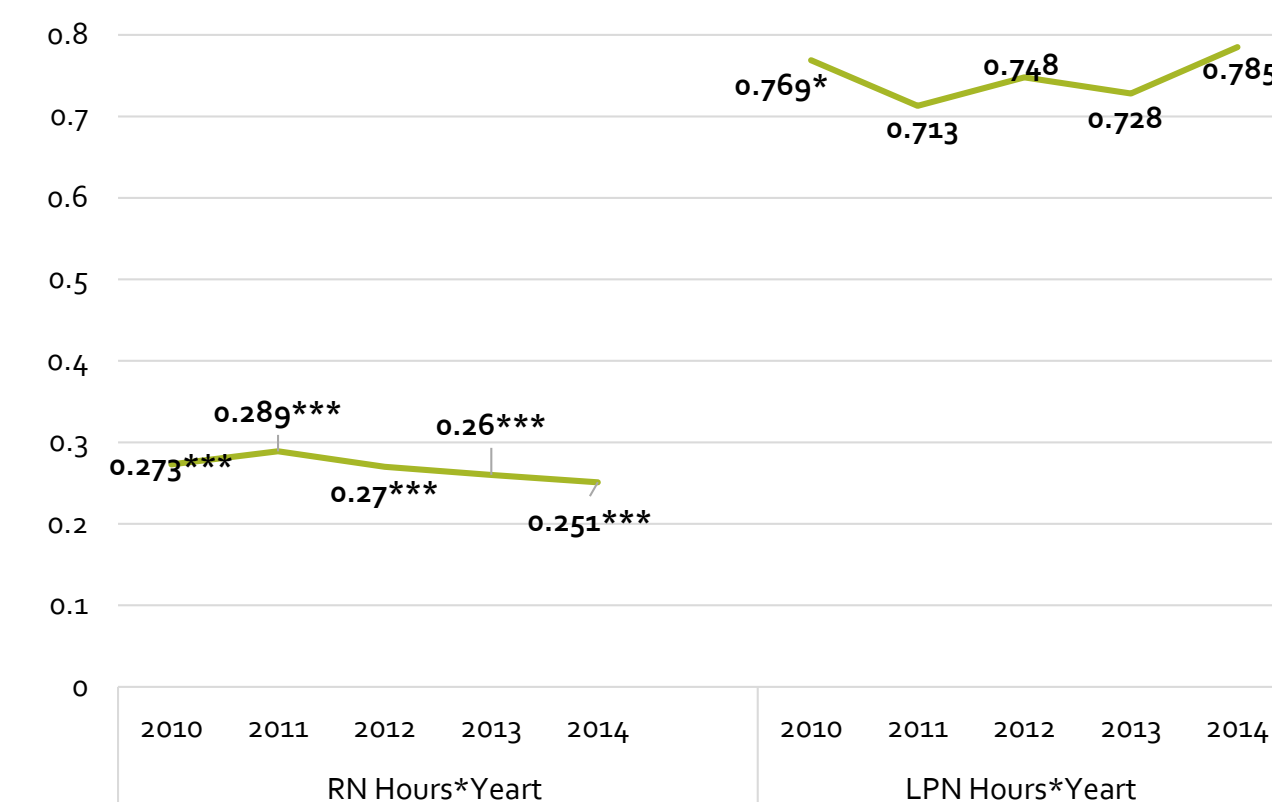
Note: \* represents statistical differences in ratios between 2010 and 2014. \*\*\*p<.01 CNLP = Clinical non-licensed personnel; RN = Registered nurse; LPN = Licensed practical nurse.

**Figure 2. Trends in All Nurse-Related CNLP, RN, and LPN Hours Per Patient Day in U.S. Hospitals, 2010-2014**



Note: Number represents average work hours per patient day for CNLP, RN, and LPN. \* represents statistical differences in ratios between 2010 and 2014. \*\*\*p<.01 CNLP = Clinical non-licensed personnel; RN = Registered nurse; LPN = Licensed practical nurse.

**Figure 4. Regression Coefficients of All Nurse-Related CNLP Hours, by RN and LPN Hours, 2010-2014**



Note: Numbers represent regression coefficients of interactions between RN/LPN hours and year dummies. Average CNLP, RN, and LPN hours were rescaled by 1,000. Models were adjusted for case-mixed adjusted patient days and hospital fixed effects. Standard e

**Statistical Analysis:** We constructed multivariate linear regressions to estimate the relationships between licensed nurse and CNLP staffing, controlling for patient acuity, volume, and hospital fixed effects. Standard errors were clustered at the hospital level. The coefficient of each interaction term indicates the relationship between nurse and CNLP staffing from year to year, with a positive coefficient implying a complementary relationship and a negative coefficient implying a substitutable relationship.

**Findings:** The overall CNLP and LPN hours per patient day declined from 2010 to 2014, while RN hours per patient day remained stable. We found no evidence of substitution between CNLP and nurses during the study period: nurse-related CNLP hours were positively associated with RN hours and not significantly related to LPN hours, holding other factors constant.

**Conclusion:** Findings point to the importance of future research to examine where and why CNLP hours per patient day have declined, and to understand the effects of these changes on patient outcomes.

**Implications**

- Substitution was a concern in the mid-1990s, during the period of expansion of managed care. Yet, it does not appear from our study that there is major task shifting from RNs to CNLP during this study period, or that RNs are being replaced by lesser-trained workers.
- More work is needed to understand possible facility-level fluctuations of these worker hours across the nation, as well as other possible differences among hospitals.
- These findings are also relevant to the development of more complex models of workforce projections at the state and national levels.

**Limitation**

1. Findings should not be generalized to all US hospitals, as Premier’s membership is primarily not for profit hospitals.
2. The small sample size may have affected the statistical power in our regressions, making substitution effects invisible.
3. The labor hour measure included not only regular work and overtime hours, but also time spent on education, meetings, and callback.
4. Data do not allow us to control for other time-variant factors, such as hospital payer mix, and market level supply of nurses and support workers.

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