The Effect of Resident Duty Hour Restrictions on Surgical Complications for Otolaryngology Head and Neck Key Indicator Procedures.

Aaron Smith, MD1; Jim Wan, PhD2; Lei Wang, MS2; Merry Sebelik, MD1
1University of Tennessee Health Science Center, Department of Otolaryngology, Head & Neck Surgery
2University of Tennessee Health Science Center, Department of Preventive Medicine

INTRODUCTION

The Accreditation Council for Graduate Medical Education enacted duty hour restrictions on all resident physicians to take full effect by the start of the 2005 academic calendar. The effects of this mandate are still being realized. Little published research has examined the impact of reduced resident work hours on patient outcomes. Studies in neuro-orthopedic and cardiac surgery programs have looked at outcomes using the National Inpatient Sample database with equivocal results.11 We aimed to characterize any differences in otolaryngology key indicator head and neck procedure complication rates before and after duty hour reform. Secondary aims included measuring volume and distribution of cases over time, with emphasis on teaching hospitals with otolaryngology training programs.

METHODS AND MATERIALS

The National Inpatient Sample, developed by AHRQ (Agency for Healthcare Research and Quality) contains information regarding patient demographics, geographic region, diagnoses, procedures, length of stay, and hospital characteristics. The database is searchable utilizing International Classification of Disease, ninth revision, Clinical Modification (ICD-9-CM) codes. For this study, otolaryngology procedure groups including four head and neck key indicators were created from these databases before and after the duty hour restrictions took effect. The first period included the dates from July 2000 to June 2003 and the second included the dates July 2005 to June 2008. (July 2003 to June 2005 represents the time during which graduated implementation of duty hour restrictions took place). Hospitals were divided based upon teaching status into three groups: non-teaching hospitals (NTH), teaching hospitals without otolaryngology programs (TH-OTO), and teaching hospitals with otolaryngology programs (TH-OTO). Statistical Analysis Software was employed to compare surgical complications (see Table 1) of the three groups using regression analysis. A modified Charlson index was built into the analysis to account for comorbidities. A p value of <0.001 was deemed significant due to the large number of variables within the database.

RESULTS

The total number of head and neck key indicator procedures was 45,363 and 51,144, for the 2000-2002 and 2006-2008 periods, respectively. Total procedures increased 12.7% from the earlier period, with TH-OTO contributing a greater share of procedures in the post-restriction years, from 21% to 30%, as compared to NTH and TH (Fig. 1). Among the procedures, thyroidectomy was performed more often at NTH during both study periods, however, TH-OTO increased the number of thyroidectomy performed by 60% between study periods. TH-OTO also achieved the highest numbers of neck dissection, oral cavity resection, and sialadenectomy by the later study period (Figs. 2, 3). Comparison of complication rates between the two periods revealed no difference, regardless of whether procedures took place at TH or TH-OTO. Similarly, no difference in complications between the earlier and later years was observed in NTH.

The total complication rate change between study periods, p values

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Thyroidectomy</td>
<td>0.58</td>
<td>0.16</td>
<td>0.46</td>
</tr>
<tr>
<td>Neck Dissection</td>
<td>0.36</td>
<td>0.23</td>
<td>0.56</td>
</tr>
<tr>
<td>Oral Cavity</td>
<td>0.59</td>
<td>0.31</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Table 2. Total complication rate change between study periods, p values

DISCUSSION

Duty hour restrictions were implemented in an effort to reduce sleep deprivation among graduate medical trainees, improving resident performance and thus patient outcomes. A secondary and less emphasized intent was to improve the quality of life of trainees through enhanced work-life balance. Opponents of this major structural change in resident training, especially among surgical educators, have predicted deterioration in patient outcomes due to more frequent handoffs, less time acquiring experience, and critical illness and, reduced case numbers resulting in lower technical competence. Despite there being a paucity of data either way, some have advocated loose duty hour restrictions, increasing the length of residency training, or otherwise restructuring training programs to achieve parity with historical training standards.

This study serves to validate that duty hour restrictions have not resulted in a deterioration of patient outcomes for those undergoing head and neck procedures in a teaching hospital. Moreover, the data show that, despite fears to the contrary, case numbers for all 4 key indicator procedures increased after duty hour restriction at teaching facilities with otolaryngology programs. No reduction in patient outcomes or case numbers were revealed for these procedures, helping to clarify a controversial issue in graduate medical education.

CONCLUSIONS

- Complications following head and neck key indicator procedures remained stable after duty hour implementation. Although duty hour regulations had the initial goal of improving patient outcomes, no change occurred.
- As a corollary, no deterioration in outcomes is evident, which some predicted would occur due to more frequent handoffs, less experience caring for postoperative patients, and less time available to develop technical competence.
- Head and neck key indicator cases have increased at teaching hospitals with otolaryngology programs, both in actual number, and as a greater share compared to teaching hospitals without otolaryngology programs and non-teaching hospitals. This may allay fears that duty hour restrictions will reduce case numbers.

REFERENCES