

Supplementary Online Content

Al-Qurayshi Z, Robins R, Hauch A, Randolph GW, Kandil E. Association of surgeon volume with outcomes and cost savings following thyroidectomy: a national forecast. *JAMA Otolaryngol Head Neck Surg*. Published online November 12, 2015. doi:10.1001/jamaoto.2015.2503.

eFigure 1. Type of Post-thyroidectomy Complications

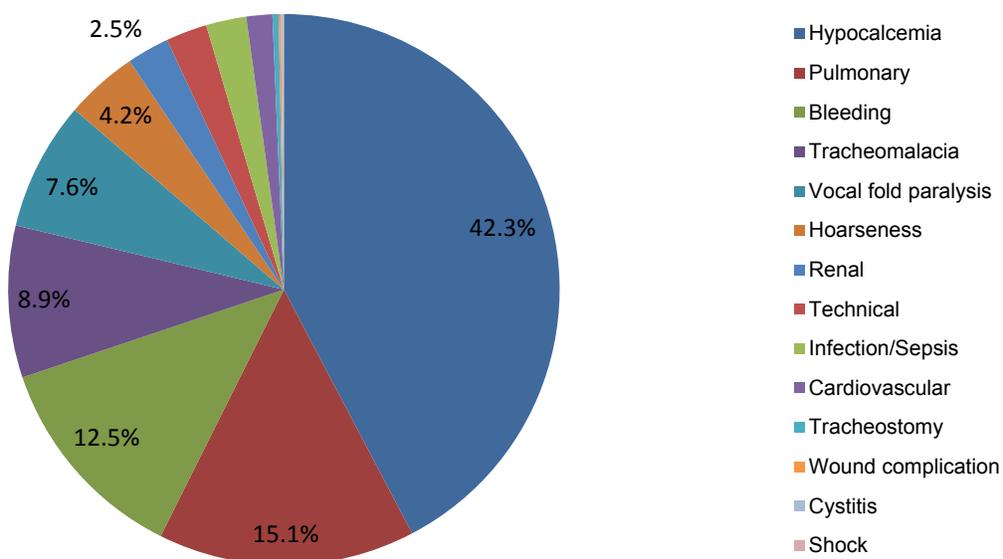
eFigure 2. Postoperative complications risk by surgeon volumes, stratified by patient and setting characteristics

eFigure 3. Cost of thyroidectomy with different types of complications

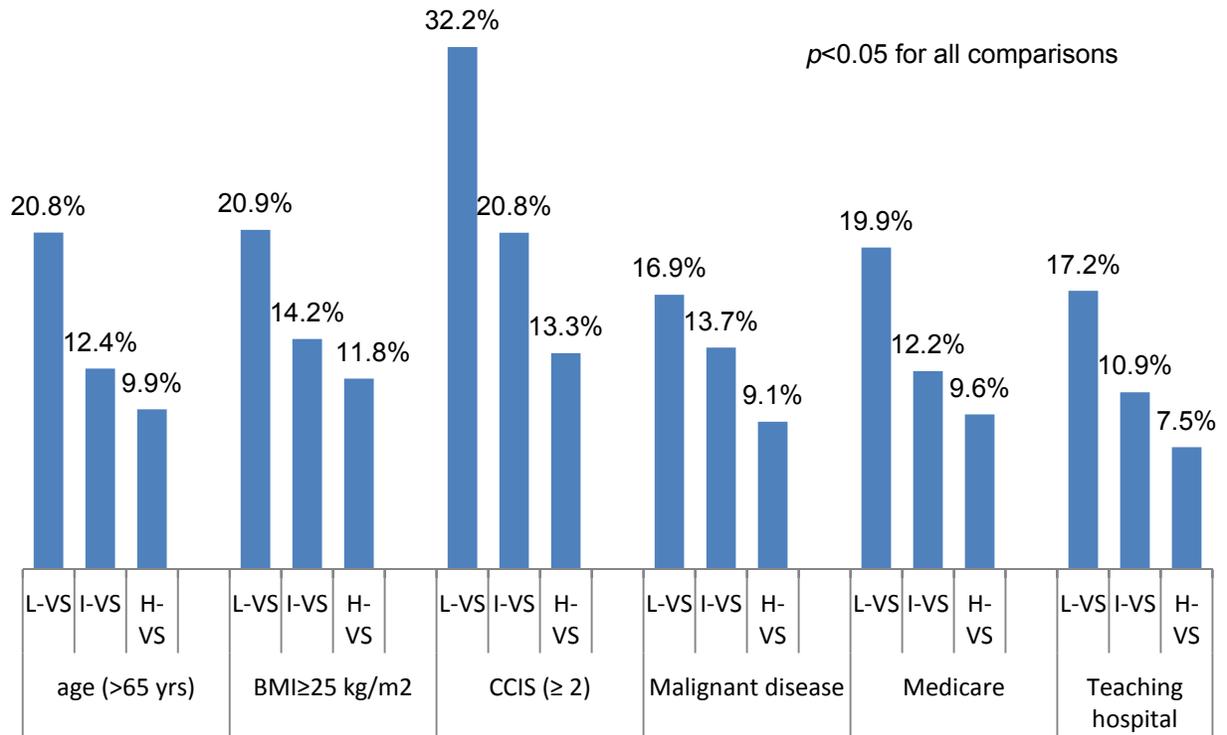
eTable 1. Details of ICD-9 complication codes

This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure 1. Type of post-thyroidectomy complications

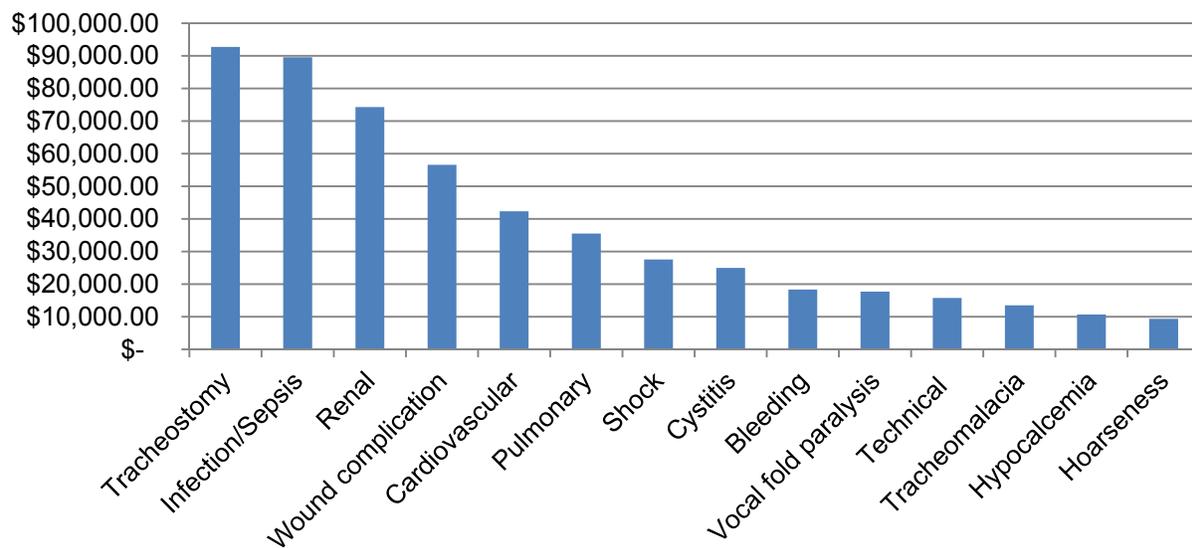


eFigure 2. Postoperative complications risk by surgeon volumes, stratified by patient and setting characteristics



Abbreviations: L-SV, low-volume surgeon; I-VS, intermediate -volume surgeon; H-VS, high-volume surgeons; BMI, body mass index; CCIS, charlson comorbidity index score.
 L-SV: 1-3 thyroidectomies/yr. I-VS: 4-29 thyroidectomies/yr. H-VS: ≥30 thyroidectomies/yr.

eFigure 3. Cost of thyroidectomy with different types of complications



eTable 1. Details of ICD-9 complication codes.

| Complication type | Code | Description |
|----------------------------|--------------|--|
| Cardiovascular | 997.01 | Cardiac arrest/insufficiency; heart failure during or resulting from a procedure. Perioperative stroke |
| | 997.02 | Postoperative stroke |
| | 997.79 | Postoperative deep venous thrombosis |
| | 415.11 | Postoperative pulmonary embolism |
| | 997.2 | Phlebitis or thrombophlebitis from procedure |
| | 410.0- 410.9 | Acute myocardial infarction |
| Pulmonary | 518 | Pulmonary collapse |
| | 518.1 | Interstitial emphysema |
| | 518.4 | Acute lung edema NOS |
| | 518.7 | Transfusion related acute lung injury (TRALI) |
| | 518.8 | Lung disease NEC |
| | 518.81 | Acute respiratory failure |
| | 518.82 | Other pulmonary insufficiency |
| | 997.3 | Mendelson syndrome, telecasts or Pneumonia resulting from a procedure |
| | 512.1 | Postoperative pneumothorax |
| | Cystitis | 595 |
| 595 | | Acute cystitis |
| 595.3 | | Trigonitis |
| 595.4 | | Cystitis in DCE |
| 595.8 | | Other cystitis |
| 595.81 | | Cystitis cystica |
| 595.89 | | Cystitis NEC |
| 595.9 | | Cystitis NOS |
| Acute Kidney Failure (AKF) | 584.5 | AKF with lesion of tubular necrosis |
| | 584.6 | AKF with lesion of renal cortical necrosis |
| | 584.7 | AKF with lesion of renal medullary necrosis |
| | 584.8 | AKF with other specified lesion in kidney |
| | 584.9 | AKF, unspecified |
| Bleeding | 285.1 | Acute post-hemorrhagic anemia. Anemia due to acute blood loss |
| | 998.1 | Hemorrhage or hematoma or seroma complicating a procedure |

eTable 1 (Continued). Details of ICD-9 complication codes.

| Complication type | Code | Description |
|---------------------|-------------|---|
| Infection/sepsis | 998.5 | Postoperative infection |
| | 998.59 | Other postoperative infection. Abscess: postoperative intra-abdominal postoperative, stitch postoperative, subphrenic postoperative, wound postoperative. Septicemia postoperative |
| | 998.51 | Infected postoperative seroma |
| | 996.62 | Infection and inflammatory reaction due to internal prosthetic device, implant, and graft—due to other vascular device, implant, and graft (arterial graft, arteriovenous fistula or shunt, infusion pump, vascular catheter (arterial) (dialysis) (venous) |
| | 995.92 | Severe sepsis |
| | 038.0-038.9 | Septicemia |
| | 785.52 | Septic shock |
| Shock | 998 | Postoperative shocks. Collapse NOS during or resulting from a surgical procedure. Shock (endotoxic) (hypovolemic) (septic) during or resulting from a surgical procedure |
| Wound complications | 998.3 | Disruption of operative wound |
| | 998.83 | Delayed wound healing |
| Hoarseness | 784.4 | Voice & resonance DIS |
| | 784.4 | Voice/resonance DIS NOS |
| | 784.41 | Aphonia |
| | 784.42 | Dysphonia |
| | 784.43 | Hypernasality |
| | 784.44 | Hyponasality |
| | 784.49 | Voice/resonance DIS NEC |
| Tracheomalacia | 784.51 | Dysarthria |
| | 519.1 | Other diseases of trachea and bronchus, not elsewhere classified |
| | 519.19 | Other diseases of trachea and bronchus, Calcification of bronchus or trachea, Stenosis of bronchus or trachea, Ulcer of bronchus or trachea |

eTable 1 (Continued). Details of ICD-9 complication codes.

| Complication type | Code | Description |
|----------------------|--|---|
| Tracheostomy | 519 | Tracheostomy complication |
| | 519 | Tracheostomy complication NOS |
| | 519.0 | Tracheostomy infection |
| | 1 | |
| | 519.0 | Tracheostomy mechanical complication |
| | 2 | |
| Hypocalcemia | 519.0 | Tracheostomy complication NEC |
| | 9 | |
| | 275.4 | Hypocalcemia |
| Vocal fold paralysis | 1 | |
| | 478.3 | Paralysis vocal cord/larynx |
| | 478.3 | Vocal cord paralysis NOS |
| | 478.3 | Unilateral partial paralysis V/C |
| | 1 | |
| | 478.3 | Unilateral complete paralysis V/C |
| | 2 | |
| | 478.3 | Bilateral partial paralysis V/C |
| 3 | | |
| Technical | 478.3 | Bilateral complete paralysis V/C |
| | 4 | |
| | 998.2 | Accidental laceration during a procedure NEC |
| | 998.4 | Foreign body accidentally left during a procedure |
| | 998.6 | Persistent postoperative fistula |
| 998.7 | Acute reaction to foreign substance accidentally left during a procedure | |

Abbreviations: NEC: Not Elsewhere Classified; NOS: Not Otherwise Specified; DCE: diseases classified elsewhere; DIS: disorder; V/C: vocal cord.