# Rates, Causes, and Reduction of 30-Day Readmissions of Otolaryngology–Head and Neck Surgical Cases

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## Abstract

*Objectives.* The aim of this study was to determine risk factors associated with 30-day readmission for patients undergoing inpatient otolaryngologic head and neck surgery.

*Study Design.* Retrospective cohort study analysis.

*Setting.* Study at 2 tertiary hospitals.

*Methods.* A 10-year retrospective cohort analysis was performed for 30-day readmissions of otolaryngology surgical cases between July 1, 2006, and June 30, 2016, at Assir Central Hospital and Abha Private Hospital. Data included total number of patients, type of surgical procedure, number of and reasons for readmissions, and length of hospital stay.

*Results.* There were 32,662 discharges for otolaryngology operations over the 10-year period of the study, of which 364 patients were readmitted, giving a rate of 11.14 readmissions per 1000 operative procedures (95% CI, 10.1-12.3). The male:female ratio was 1.4:1. Period of postoperative stay ranged from 1 to 3 days and, after readmission, 2 to 5 days. The main reasons for readmission were bleeding in otolaryngologic cases and wound hematoma in head and neck surgical cases. Overall readmission rates dropped significantly from 12.72 per 1000 operative procedures in the first 5 years to 10.16 in the second 5 years.

*Conclusions.* This study helped to establish special policies and procedures to prevent readmission by utilizing best practices, including addressing quality care, using preadmission clinics, preventing surgical site infection, and improving communication with community physicians. Plans based on these results also include the development of national model for predicting readmission within 30 days of discharge.

## Keywords

readmission, reduction rate, surgery, postoperative, otolaryngology

Emergency admissions are defined as those that are not predicted and that occur at short notice due to perceived clinical need.[1] Patients, caregivers, and administrators are concerned about rates of readmission following an inpatient surgical procedure.[2] Accordingly, hospital readmissions can be considered markers of suboptimal or costly health care when they occur within 30 days following discharge.[3-5] The average all-cause 30-day readmission rate in the United States is approximately 18%, which has remained unchanged for several years despite efforts to lower it.[6-8] A recent study showed that approximately 1 of 12 patients undergoing otolaryngologic surgery had a 30-day readmission.[9]

Studies investigating all-cause risk factors for hospital readmission within 30 days of hospital discharge have identified several causes, such as the use of high-risk medications, critical care exposure, organ dysfunction, severity of illness indicators, and laboratory abnormalities.[10] Other common risk factors include poor physical functioning[11,12] and social factors such as social instability and living alone.[13-15] In the United States, hospitals are financially penalized for unacceptable levels of readmissions, through the Hospital Readmissions Reduction Program. There are no such studies in the Kingdom of Saudi Arabia. This study was conducted with the aim of identifying the rate and potential risk factors for readmission so that they can be tackled. This is important in improving patient care and optimizing discharge planning and care coordination in hospitals and among clinicians.

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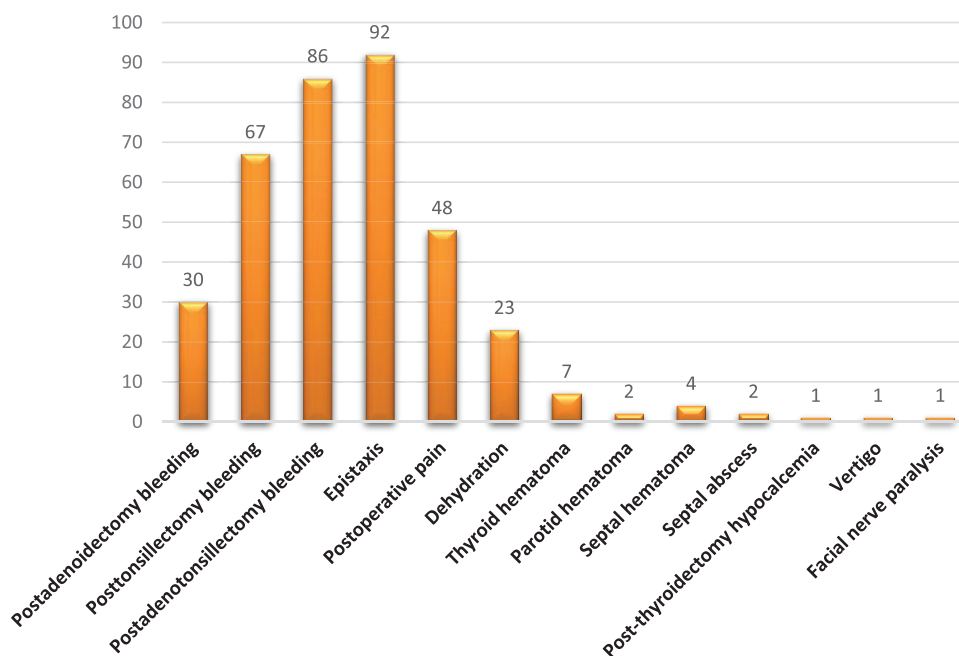
**Figure 1.** Causes of total 30-day readmissions during the study period.

## Methods

Approval was obtained from the Research Ethics Committee at the College of Medicine, King Khalid University, Abha, Kingdom of Saudi Arabia. A 10-year retrospective cohort analysis was performed for 30-day readmissions of otolaryngologic and head and neck surgical cases following discharge from hospital. Data of patients undergoing an otolaryngologic or head and neck surgical operation between July 1, 2006, to the end of June 2016 were collected and included total number of patients operated on, type of surgical procedure, numbers and reasons for readmissions, and length of hospital stay in both times. Fisher's 95% CIs for the proportions were calculated. Pearson's chi-square was used as a test of significance at the 5% level.

## Results

There were 32,662 patients who underwent an otolaryngologic or head and neck surgical procedure over the 10-year period of the study, of which 364 patients were readmitted within 30 days from discharge. This produced a rate of 11.14 readmissions per 1000 operative procedures (95% CI, 10.1-12.3). The male:female ratio was 1.4:1, and ages ranged from 1 to 97 years. The period of postoperative hospital stay ranged from 1 to 3 days and, after readmission, 2 to 5 days. Eighteen cases were readmitted for the second time, giving a second readmission rate of 0.55 per 1000 operative procedures (95% CI, 0.311-0.921).

The causes of readmission within the 30 days from discharge are shown in **Figure 1**. By far, the main reason for readmission in otolaryngology surgical cases in this study was bleeding, while in head and neck operative cases, it was

hematoma formation. The most frequent reasons for readmissions were epistaxis (92), postadenotonsillectomy bleeding (86), and posttonsillectomy bleeding (67). However, among the 18 patients who were readmitted for the second time, the most frequent causes were postadenotonsillectomy bleeding (6) and posttonsillectomy bleeding (4).

The overall readmission rate dropped from 12.72 readmissions per 1000 operative procedures in the first 5 years of the study to 10.16 in the second 5 years, as shown in **Figure 2**. The difference is statistically significant (Pearson's chi-square = 4.561, $P$ = .033).

## Discussion

Health care systems today have considered readmission a sign of patients' suboptimal quality of care.[16] Readmission is defined as rehospitalization within 30 days of discharge. Unplanned hospital readmissions are costly, can reflect poor quality index hospital care, and can lower patients' quality of life. In 2009 and due to the importance, hospitals in the United States were required to publicly report their readmission rates, and in 2013, financial penalties were imposed on medical facilities in select readmission cases. In 2015, the Hospital Readmissions Reduction Program of the Affordable Care Act expanded the scope to include surgical procedures.[17-19]

In many all-cause readmission studies, infection was identified as the most common reason for postdischarge readmission.[20-22] However, in other studies, previous hospital admission is a consistent risk factor for readmission.[23-27] Results of our study showed that many common readmission diagnoses were related to bleeding.

Reducing hospital readmission rates should be included in the policies and procedures of otolaryngology and head
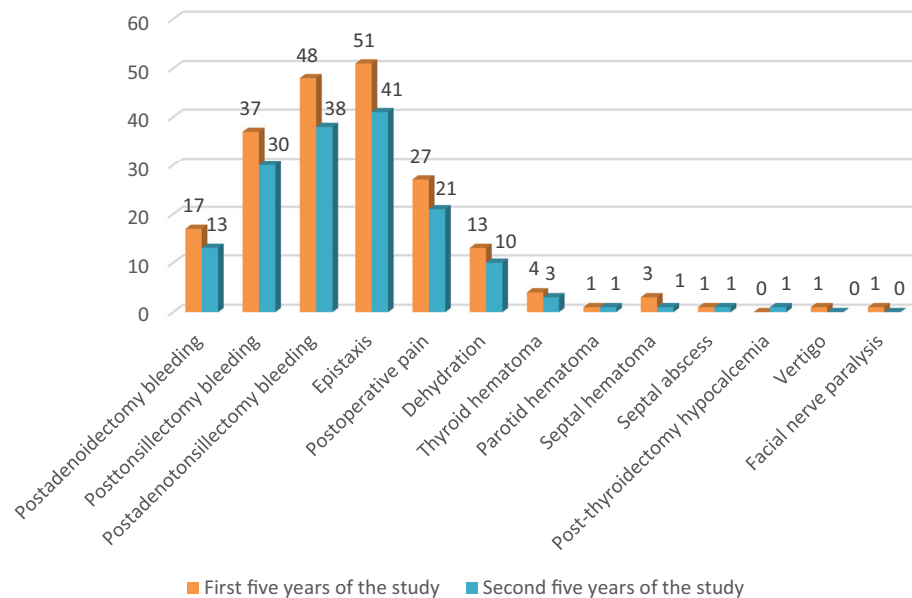
**Figure 2.** Comparison of causes of 30-day readmissions in the first and second halves of the study.

and neck surgical departments. Following completion of this study and analysis of its results, a model has been postulated and put into action. It is expected that implementing such model will prevent the readmission of otolaryngology and head and neck surgical cases following discharge.

It is believed that preventing or reducing hospital readmissions starts with the decision for surgery and continues through the hospital stay and the postdischarge period. Patients should attend the preoperative clinic to undergo screening for correctable issues before surgery, to perform a battery of baseline laboratory and imaging tests, and to optimize chronic medical conditions. Patients who do not attend such clinics have an 8-fold greater chance of a 30-day readmission.[28]

The rate of readmission in this study was low in comparison with other studies elsewhere. The overall readmission rate dropped from 12.72 readmissions per 1000 operative procedures in the first 5 years of the study period to 10.16 in the second 5 years. The improvement in the numbers of readmissions in the second half is due to implementation of quality standards in both hospitals. During the 10-year period of the study, hospitals in the Kingdom of Saudi Arabia were instructed to implement a quality program in their health care services and to work toward obtaining recognition from a health care accreditation body. This resulted in the accreditation of Assir Central Hospital by the Joint Commission International organization and Abha Private Hospital by the Central Board for Accreditation of Health Institutes. We believe that implementation of the recommended quality standards in both hospitals has contributed to a reduction in the readmission rate, as evidenced by comparing the second half of the study period with the first half. This means that implementation of health care quality criteria is an important element in the reduction of readmission

rate. In addition, regular surveys and quality rounds are used to evaluate patient and staff satisfaction, and areas of concern are acted on to improve the mutual relationship between patient and care team. Improving communication helps patients to better understand their care when discharged from hospital.

Discharge planning and patient education must be given attention through available audiovisual means and instructional pamphlets. Following discharge, patients are given coordinated follow-up appointments with their surgeon and ancillary staff to monitor at-home recovery. While the incidence of surgical site infection was low in our study, a previously published study showed it to be the most common predictor for readmission.[29] Guidelines preventing wound infection should be followed as they regard selection, appropriate timing, and duration of prophylactic antimicrobial agents.

In summary, this study is the first of its kind in the Kingdom of Saudi Arabia, and its results will be used in the development of a model for predicting which patients are most at risk of readmission within 30 days from discharge.[30]

## Author Contributions

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