Abstract

Background: A readmission is classified as a patient necessitating readmission to hospital due to a post-operative complication following discharge. An overstay however, is classified as a patient having to stay longer than the planned duration in hospital (not having been discharged in the interim) due to a post-operative complication. This study aims to investigate patient-related factors that predispose to readmission or overstay and thus make recommendations to decrease the likelihood of readmission or overstay.

Method: In this retrospective study 312 ‘day-case nasal procedures’, were selected from a total cohort of 4274 ENT patients over a 17-month period. This sub-group was investigated for a range of demographic factors including, age, gender and ethnicity with regards to their relationship to readmission rates and overstay frequency and duration.

Results: The rates were 2.88% and 9.62% for readmission and overstay respectively. The total number of days spent in hospital as a result of readmission was 27. Epistaxis was the leading cause for readmission/overstay (28.9%) followed by high levels of post-operative pain preventing them from being discharged (23.7%). All procedures in this study had readmission rates that were below those recommended in the guidelines set by the Royal College of Surgeons of England. Women overstayed significantly longer ($t = 1.65$, $p < 0.05$) than men.

Conclusions: Suitable candidates for day-case ENT surgery highlighted by this study include healthy individuals between the ages of 20 and 60. Operating in the morning would increase the immediate post-operative recovery time, which may reduce the numbers of patients who complain of high levels of pain at the time of discharge. Procedures such as septorhinoplasty being performed routinely in the ambulatory setting require additional research into more effective methods of pain control. Standards need to be improved so that the causes of overstay and readmission are clearly identifiable in patient records.

Background

Day-case surgery has rapidly expanded as a cost-effective and resource-conserving surgical intervention to the point that well in excess of two million operations are performed in a day-case/ambulatory setting in the United Kingdom alone each year [1]. Day-case surgery is based on operating on a patient and aiming to discharge them on the same day. Ear, nose and throat procedures account for a significant proportion of these ambulatory procedures and include operations such as functional endoscopic...
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which predict the likelihood readmission or overstaying
Department of Health has suggested that day-case surgery
may not be saving the NHS money [3]. However, previous
reports have advocated day case septal surgery as a safe
and effective practice [4-6]. Furthermore, a subjective
patient based study showed that septoplasty is generally
acceptable to the patient in terms of pain and overall sat-
satisfaction parameters [5,7].

Studies have shown that day-case septorhinoplasty is
associated with a low complication rate and is a safe and
acceptable procedure provided that stringent patient
selection criteria are adhered to [8]. A specific area of dis-
satisfaction previously identified is inadequate pain con-
trol following discharge and this may lead to higher costs
for the general practitioner. However, a recent study inves-
tigating parental satisfaction with 100 paediatric otorhi-
ology case-day procedures concluded that with
careful patient selection the degree of satisfaction with day
surgery is high for a wide variety of procedures [9,10].

There have been no studies performed, which have
directly investigated the 'patient demographic factors'
which predict the likelihood readmission or overstaying
the electively planned period in hospital following day-
case ENT operations. This is of importance as it would be
beneficial to know if certain groups of patients require
more rigorous screening pre-operatively in an attempt to
reduce readmission and 'overstay' rates. By identifying
this cohort of patients, the NHS could save substantial
amounts of acute and primary care expenditure in the
backdrop of ever-rising day-case ENT procedure numbers.
Many studies have suggested that ENT procedures cur-
rently performed as overnight cases could be performed as
day-cases provided strict criteria are applied in the selec-
tion of patients [1,11]. However, none of these studies
provide a clear description as to which patient groups are
potentially unsuitable for undergoing day-case proce-
dures based upon their predisposition to require readmis-
mission or stay in hospital longer than electively planned.

Previous data fails to distinguish between readmissions
and over stays following nasal day-case surgery [11]. They
also fail to investigate demographic indices such as age,
gender, and ethnicity [5]. The present study has been con-
ducted in the climate of an ever-advancing quality-driven
clinical environment in which meticulous patient selec-
tion is vital in optimal patient post-operative care and
recovery. This study of 312 elective day-case nasal opera-
tions selected from a cohort of 4274 ENT patients investi-
gated a range of patient variables that influenced
readmission and overstay frequency and duration.

This study investigates departmental day-case nasal sur-
gery at Guy's hospital and aims to determine:

a) If it has readmission rates below that of the accepted
standard for day-case surgery stipulated by the Royal Col-
lege of Surgeons of England.

b) If readmission rate and unplanned overnight stay are
related to epidemiological characteristics of the sample
such as age, gender, and ethnicity.

and to report results in the context of clinical management
by making recommendations to improve the readmission
rates in each category proposed.

Method
This is a retrospective study in which the total number of
ENT operations performed between the period of 3rd January
2002 and 28th June 2003 were investigated. All ENT
patients operated on during this period were selected
from the Guy's & St. Thomas' NHS Trust database. The
hospital database has a limited range of broad categories
and this can limit interpretation of results thus all availa-
ble patient notes were also reviewed.

All planned day-case procedures were selected from the
total cohort of elective ENT operative procedures.
The day-case procedures were then further narrowed down to
'nasal day-case procedures'.

Firstly the total number of readmission episodes, overstay
frequency and duration in the 'day-case nasal procedures'
were calculated. A readmission is classified as a patient
necessitating readmission to hospital due to a post-opera-
tive complication following discharge. An overstay how-
ever, is classified as a patient having to stay longer than the
planned duration in hospital (not having been discharged
in the interim) due to a post-operative complication. The
groups of nasal operations of interest in this study in the
light of previous studies are (septo)rhinoplasty, excision
of lesion, polypectomy, sinus operation and other (which includes procedures such as intranasal ethmoidectomy, and division of adhesions of turbinate of nose etc).

A range of demographic factors including, age, gender and ethnicity were investigated with regards to their relationship to readmission rates and overstay frequency and duration. Statistical analysis including Chi-square tests, t-tests and ANOVA were performed on the above variables.

Results
The total number of ENT operations performed between the period of 3rd January 2002 and 28th June 2003 were 4274. From this cohort 501 operations (11.72%) were planned as elective ENT day-case procedures. This selected sub-sample of 501 day-cases was further narrowed down to those, which pertained to 'nasal procedures' and this group numbered 312 (62.28%). There were a total of 9 readmission episodes following 'day-case nasal procedures' during the 17-month period, which equates to a readmission rate of 2.88%. The total number of days spent in hospital as a result of readmission was 27. All patients readmitted following day-case nasal procedures were male (Fischer Exact Test = 4.41, p < 0.05). The nasal operations were grouped into (septo)rhinoplasty, excision of lesion, polypectomy, sinus operation and other.

Those patients that were required to stay longer than electively planned i.e. one day, are termed by the Guy’s & St. Thomas’ NHS Trust and indeed in this study as ‘overstays’. The minimum duration of overstay in our sample was one day and the maximum was 2 days. The total incidence of patients overstaying was 30 (overstay rate = 9.62%) during the timeframe studied and this equates to a total of 48 overstayed days.

Cause of readmission and overstay
Epistaxis was the leading cause for readmission/overstay n = 11/38 (28.9%) followed by levels of post-operative pain unacceptable to the patient and thus preventing them from being discharged (23.7%).

Type of procedure
The readmission rate for (septo)rhinoplasty is 1.38% and the overstay rate is 9.22%. From the analysis of days overstayed expressed as a fraction of the number of procedures performed, polypectomy and sinus operations have the highest number of days overstayed per procedure. Although the (septo)rhinoplasty overstay rate is 9.22% the number of days overstayed expressed in the context of the number of actual (septo)rhinoplasties performed is equal to the average (see Figure 1).

Gender
Women overstayed significantly longer (t = 1.65, p < 0.05) than men.

Age
The frequency of readmission is highest in those patients aged <20 followed by those in the 60–70 year age category. Although the patients aged above 70 years have the lowest readmission frequency, the sample size is low (n = 5) and thus the 30–40 year age category is more reliable a sample representative of a low readmission frequency. Analysis of the age of patients and frequency of day-case procedures revealed that the group containing those patients aged between 30–40 underwent the greatest number of nasal day-case procedures. However, when considering the number of overstays in terms of the numbers of procedures performed, the 30–40 age category has the lowest overstay duration as opposed to the >70 which has the highest.

Ethnicity
Analysis of variance (ANOVA) shows that the difference in overstay rates between ethnic groups did not reach statistical significance (F = 1.22, p = 0.40).

Discussion
In July 2000, the Department of Health published that 75% of surgical procedures carried out by the NHS should be performed in a day-case setting by 2010. This initiative was supported by both The Royal College of Surgeons of England and The Royal College of Physicians of England.

Within the period of the current study there were a total of 4274 ENT operations performed at Guy’s during the timeframe of investigation. Of this group 501 (11.72%) were planned as elective ambulatory procedures with the intention of same day discharge. Primarily the government target was ambiguous with regard to the types of procedure for which it aimed to conduct on a routine day-case basis. Whilst it is conceivable that some ENT procedures such as myringotomy could be performed safely as a day-case procedure, more complex and involved procedures such as deep exploration of the neck and tumour excision would be unsuitable for such rapid discharge. With no clear guidelines as to which procedures are suitable for the day-case setting, the responsibility of advancing the boundaries of ambulatory surgery rests on the clinicians, with the patients’ wellbeing being at the forefront of interest.

The readmission in this study is 2.88%. These readmission rates are lower than those reported in the contemporary literature [4,8,11]. The readmission rate for (septo)rhinoplasty is 1.38% and the overstay rate is 9.22%. These rates are lower than those stipulated by the
Royal College of Surgeons of England which pertain to
day-case surgery in general (2–3%) as opposed to ENT
cases per se.

Epistaxis was the leading cause for readmission/overstay
(28.9%) followed by levels of post-operative pain unac-
cetable to the patient and thus preventing them from
being discharged (23.7%). The cause of epistaxis was not
recorded in the notes nor was the reason behind why
some patients experience more pain than others. These
results are in contrast to previous subjective patient based
studies, which show that septrhinoplasty is generally
acceptable to the patient in terms of pain and overall satis-
faction parameters [5]. Women overstayed significantly
longer ($t = 1.65$, $p < 0.05$) than men. A similar phenome-
non has been reported in a study of cardiothoracic patient
readmissions [12]. In this study the female predilection to
increased in-hospital recovery time was attributed to vari-
ous gender-associated factors.

Age is not a contraindication for ENT day-case surgery.
The low readmission rate of patients over 70 years of age
could be attributed to a number of factors including,
heightened caution of the clinician in patient discharge, a
low sample number and age-related variation of procedure
type are dominant.

There have been no previous studies, which have investi-
gated the effects of ethnicity on readmission rates or over-
stay duration. The current study shows that mixed race
patients followed by black patients have the highest
number of days overstay per procedure. Analysis of var-

![Figure 1](image-url)

Days overstayed as a fraction of the procedures performed.
iance (ANOVA) shows that there is no significant difference between ethnic groups and the length of overstay (F = 1.22, p = 0.40).

Conclusions
Day-case procedures should be performed on suitable candidates on a sound clinical basis. This includes meticulous patient selection, both on the part of the surgeon and the health care professionals in the preoperative assessment. Suitable candidates for day-case ENT surgery highlighted by this study include healthy individuals between the ages of 20 and 60. A protocol for day-case surgery does exist and this may need revision.

In the clinical setting however, epistaxis needs to be made a clinical priority by ensuring that all levels of healthcare professionals are aware of its causes and its effective immediate management. We suggest from experience that operating in the morning would increase the immediate post-operative recovery time, which may reduce the numbers of patients who complain of high levels of pain at the time of discharge. Procedures such as septrhinoplasty being performed routinely in the ambulatory setting require additional research into more effective methods of pain control. Clinical administration standards need to be improved so that the causes of overstay and readmission are clearly identifiable in patient records.

Competing interests
The authors declare that they have no competing interests.

Authors' contributions
Mr. Gurminder Singh (first and corresponding author) performed the data collection and wrote the paper with assistance from Mr. David McCormack (second author). Mr. David Roberts supervised the study and reviewed the completed manuscript.

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Pre-publication history
The pre-publication history for this paper can be accessed here:
http://www.biomedcentral.com/1472-6815/4/2/prepub