

# OPEN ACCESS UPPER GASTROINTESTINAL ENDOSCOPY: FINANCIAL BURDEN OR BENEFIT FOR HOSPITALS?

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## ABSTRACT

**OBJECTIVES:** To assess the efficiency of an open access upper gastrointestinal endoscopy (Oesophagogastroduodenoscopy, OGD) service at Taranaki base Hospital, New Zealand by comparing the diagnostic yield of referrals made by hospital-based consultants with those from general practitioners (GPs) to see if GPs were referring more patients with normal examination.

**METHODS:** For 12 consecutive months, from the 1st of Dec 2013, data was collected prospectively for all diagnostic OGD's done at Taranaki Base Hospital. Analysis of the number of normal OGD's and the diagnostic yield of abnormal findings from each source of referral (consultant vs GPs) was done using the chi square test.

**RESULTS:** Out of 829 diagnostic OGD's, 499 (60.2%) were referred by hospital-based consultants from all specialties and 330 (39.8%) by GPs. Anaemia and/or Upper GI bleeding (n=280/829; 33.8%) and dyspepsia (n=254/829; 30.6%) were the common indications for OGD referrals. Overall 292/829(35.2%) OGDs were normal. OGDs were normal in 91/330 (27.6%) GP-referrals and 201/499 (40.3%) consultant-referrals (p<0.05). Gastroesophageal reflux disease was the commonest finding on OGD in 151/330 (45.8%) GP-referrals and 154/499 (30.9%) consultant-referrals. Malignancy was detected in 4/330 (1.2%) GP-referrals and 13 (2.6%) consultant-referrals (p=0.16).

**CONCLUSION:** We did not find a higher rate of normal OGD's in patients referred to Taranaki Base Hospital by the GPs, which goes against the usual assumption that open access upper gastrointestinal endoscopy service (utilized by GPs) is a financial burden on a public funded health system. We think it is an effective way of managing most dyspeptic patients in community.

**KEY WORDS:** Endoscopy, Gastrointestinal (MeSH), Open access system (Non-MeSH), Taranaki Base Hospital (Non-MeSH), General Practitioners (MeSH), Referral and Consultation (MeSH), Physicians (MeSH).

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cally funded health system.<sup>2</sup> The concept is not new and is in use in many centres in USA and Europe.<sup>3-5</sup>

This service was started in Taranaki twenty years ago. It was setup for general practitioners to manage dyspeptic patients in community, to reduce the waiting time to diagnosis and to reduce cost by avoiding an outpatient's visit before OGD in those that need one. Concerns have been raised about open access service (general practitioner referrals), setting the threshold for referrals too low thus potentially overwhelming a busy endoscopy service and an increase in the waiting times which is not what this system was set up for. Moreover, OGD is a safe procedure but has some risks<sup>1</sup> and an increase in inappropriate referrals expose those referred to these risks. Major complications are rare and can include bleeding, perforation and mortality.<sup>1</sup> Kerrigan et al<sup>6</sup> and Heaney et al<sup>7</sup> both audited open access service and concluded that assumptions of increase work load and more negative examination from open access service was not factual.

The objectives of this study were to audit the open access OGD service in Taranaki base hospital (TBH) and to see if the concerns of more negative examinations, increase work load, increase patient waiting time and being most costly holds true in a provincial New Zealand setting.

## METHODS

A prospective audit of 829 first assessment diagnostic OGD's carried out at TBH was performed from 1<sup>st</sup> Dec

## INTRODUCTION

Oesophagogastroduodenoscopy (OGD) is a widely available and relatively safe upper gastrointestinal endoscopic procedure done all around the world.<sup>1</sup> With increasing population, across New Zealand and increase in de-

mand for OGD, all centres are operating in an open access approach. An open access upper gastrointestinal service offers OGD without a prior visit to see the specialist in hospital and his approval, hence saving time for the patient and at the same time saving money in a publi-

2013 to 30<sup>th</sup> Nov 2014. The study was approved by the hospital Ethics committee and written informed consent from the patients was taken prior to the study. The service is provided by six general surgeons and a gastroenterologist. Referrals were divided into two groups; consultant referrals (inpatients, public outpatient clinics and private rooms) and general practitioner (GP) referrals. Five categories of pathologies were generated to compare the two groups:

1. Normal
2. Gastroesophageal reflux disease (GORD) (reflux oesophagitis, reflux stricture and oesophageal metaplasia)
3. Peptic ulcer disease (PUD) (gastric / duodenal erosions, gastric / duodenal ulcers)
4. Malignancy (oesophageal / gastric)
5. Others (angiodysplasia, Dieulafoy lesions, Mallory Weiss tear and varices etc.)

### Statistics:

The null hypothesis was that there is no difference between the two referral groups with respect to pathology and normal findings. Statistical Package for the Social Sciences for Windows, version 19.0 (SPSS Inc., Chicago, IL, USA) was used for all analyses. Chi square test was used to compare the difference in the prevalence of abnormal and normal examinations between two groups. Statistical significance was defined as a p value less than 0.05. The p value was calculated for mutually inclusive data (some patients had more than one pathology), as 0.22 (74) of GP and 0.18 (93) of consultant referrals had multiple pathologies.

## RESULTS

Consultants from all the specialties referred 499 (60.2%) while the GP's referred 330 (39.8%) patients for diagnostic OGD's during the time period of this study. The age distribution of two groups was similar (median age 65 (7-95)

years and 66 (15-92) years respectively. The gender distribution of two groups was not statistically different (male to female ratio 1.17 [consultant referrals] vs 1.5 [GP referrals]).

Table I summarizes the indication for referrals with the number of patients in each category between two groups. Consultants had significantly fewer referrals with dysphagia but there were no other differences.

The findings at OGD (Table II) shows that GP's were referring fewer patients having normal OGD's (91 of 330 [27%] vs 201 of 499 [40%];  $p < 0.05$ ) and their endoscopic diagnostic rate for GORD and PUD was higher as compared to their hospital counterparts. There was no difference in diagnosing upper gastrointestinal malignancies between the two groups.

As this result was unexpected, it was decided to eliminate the bias from urgent referrals, which were primarily from consultants. These are the patients who were admitted through the emergency department or referred by the general practitioners to the on-call team and who were ill enough to receive admission and an urgent OGD. Presenting complaints included severe upper abdominal pain, coffee ground vomiting, hematemesis, melena and / or dysphagia.

GP referrals were primarily elective and made up only 26.1% (89 out of 330) of urgent gastroscopies. Table III summarizes the findings after the urgent referrals have been eliminated. GP referrals still had fewer normal examinations (73 of 241 [30%] vs 105 of 241 [41%];  $p < 0.05$ ) with a higher detection rate for GORD and PUD.

No malignancies were diagnosed in routine patients in either group as patients with red flags (iron deficiency anaemia, persistent and protracted vomiting, abdominal mass, unexplained weight loss more than 5 kgs and severe persisting pain) got an urgent OGD.

**TABLE I: INDICATION FOR REFERRALS IN GENERAL PRACTITIONER AND CONSULTANT GROUPS (URGENT AND ELECTIVE REFERRALS)**

	GP referrals (n=330)	Consultant referrals (n=499)	p value
Anaemia and/or Upper GI bleeding (n=280)	110 (33.3%)	170 (34.1%)	0.8
Dyspepsia (n=254)	90 (27.3%)	164 (32.9%)	0.08
Vomiting (n=85)	30 (9.1%)	55 (11%)	0.3
Dysphagia (n=80)	50 (15.2%)	30(6%)	<0.05
Upper abdominal pain (n=130)	50 (15.2%)	80 (16%)	0.7

**TABLE II: ENDOSCOPIC DIAGNOSIS IN GENERAL PRACTITIONER AND CONSULTANT GROUPS (URGENT AND ELECTIVE REFERRALS)**

	GP referrals <sup>#</sup> (n=330)	Consultant referrals <sup>#</sup> (n=499)	p value <sup>\$</sup>
Normal (n=292)	91 (27.6%)	201 (40.3%)	<0.05
Gastroesophageal reflux disease (n=305)	151 (45.8%)	154 (30.9%)	<0.05
Peptic Ulcer Disease (n=288)	134 (40.6%)	154 (30.9%)	<0.05
Malignancy (n=17)	4 (1.2%)	13 (2.6%)	0.16
Other (n=109)	52 (15.8%)	57 (11.4%)	0.07

\$: p values are calculated on mutually inclusive data

#: 74 (22%) of GP referrals and 93 (18%) of Consultant referrals had multiple pathologies

**TABLE III: ENDOSCOPIC DIAGNOSIS IN GENERAL PRACTITIONER AND CONSULTANT GROUPS (ELECTIVE REFERRALS ONLY)**

	<b>Elective GP referrals (n=241)</b>	<b>Elective Consultant referrals (n=247)</b>	<b>p value</b>
Normal	73 (30 %)	105 (42%)	<0.05
GORD	104 (43%)	83 (33%)	<0.05
PUD	97 (40%)	70 (28%)	<0.05
Malignancy	0 (0%)	0 (0%)	—
Others	33 (14%)	29 (11%)	0.5

GORD = Gastroesophageal reflux disease; PUD = Peptic Ulcer Disease

p values are calculated on mutually inclusive data; 45 (18%) of GP referrals and 51 (21%) of Consultant referrals had multiple pathologies

## DISCUSSION

Upper endoscopy is a safe and accurate procedure. Taranaki base hospital moved to an open access service twenty years back to meet the increasing need for OGD. Since then there has been a steady increase in the number of OGDs with the worry that general practitioners are referring more patients with normal examinations (low threshold for referring) resulting in a high-pressure demand with the risk of delaying the examinations for those patients with a potential serious disease. Therefore, evaluation of diagnostic yield from each source of referrals is critical to the assessment of the costs and benefits of procedures performed in an open-access setting. Previous studies have conflicting data on the misuse of the open access system. Some studies show a substantial rate of inappropriate referrals through the open access system, widely ranging from 5% to 62%<sup>8-12</sup> whereas others did not find that open access system leads to increased work load and hence delay in diagnosing patients with serious pathology.<sup>6,7</sup>

Our audit, however, provides strong evidence in favour of an open access OGD service with the advantages of early diagnosis as patients don't have to wait for an outpatient visit prior to OGD while the hospital saves money by not seeing patients in the outpatient's department. In present study, general practitioners had fewer patients with normal OGD examination compared to their hospital

counterparts ( $p < 0.05$ ). This difference persisted once acute OGD's were taken out of analysis to eliminate the bias, that more sicker patients present mostly to emergency department and hence referred by the hospital based consultants. Further analysis showed that GP referrals had more patients who had PUD and GORD compared to their hospital based counterparts ( $p < 0.05$ ). No statistical difference was seen in patients with upper gastrointestinal malignancy between the two groups ( $p = 0.16$ ).

A normal upper gastrointestinal endoscopy rate of 40%<sup>13-15</sup> has been reported in previous studies for both consultant and general practitioner referrals. This number seems high but the value of a normal examination should not be underestimated as it removes some upper gastrointestinal diseases from the differential diagnosis. Not only does this provide reassurance to the doctor but it also leads to less empirical treatment. In this study consultant based referrals had more normal examinations compared with GP referrals ( $p < 0.05$ ) but their rate of normal examinations is similar to that mentioned in the literature<sup>13-15</sup> and it also reflects the fact that they see more urgent patients where doing an OGD helps to exclude upper gastrointestinal pathology as a cause of the patient's symptoms.

In addition, although the probability of detecting a clinically relevant finding has been considered an important parameter

for the appropriateness of endoscopy, a normal endoscopy in patients with dyspepsia greatly reduced the number of consultations and the prescription rates in one study.<sup>16</sup> Studies have also demonstrated a better quality of life and patient satisfaction, for patients with dyspepsia after the finding of a normal OGD.<sup>17</sup>

The drawback of this study was that it did not look in to the fact that high diagnostic yield from the general practitioners is because of high rate of adherence to the American society of gastroenterology (ASGE) guidelines for referring patients for OGD. This question can be addressed by doing another similar study with predictor variable being ASGE guidelines and outlook variable being diagnostic yield.

## CONCLUSION

In conclusion, open access upper gastrointestinal endoscopy service for general practitioners provides more rapid diagnosis and treatment of most dyspeptic patients in the community and reduces visits to the out patient's clinic. There are substantial cost savings and we feel that the current practice should continue.

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#### CONFLICT OF INTEREST

Authors declared no conflict of interest

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#### AUTHORS' CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

**MT:** Concept & study design, acquisition, analysis of data; Drafting the manuscript, final approval of the version to be published

**WG:** Acquisition, Analysis & interpretation of data; Drafting the manuscript, Critical Review, final approval of the version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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