

# A survey of the ophthalmic presentations and their outcomes to a general hospital Emergency Department over twelve months

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**Aim:** To survey the diagnoses and discharge status of the ophthalmic presentations to a general emergency department (ED). To compare the ED diagnosis with the ophthalmologist diagnosis of referred patients. **Methods:** A retrospective analysis of all the ophthalmic presentations to the Gosford District Hospital from 1 January 2005 to 31 December 2005 was carried out. All referrals to and admissions by ophthalmologists were reviewed for the final diagnosis. These outcomes were compared to the initial ED diagnosis. **Results:** There were 509 ophthalmic presentations to the ED in 2005: 51% had corneal trauma, 14% had an unspecified red or painful eye, 9% had an unspecified eye injury and 5% had blurred vision. Most patients were discharged without referral. Twenty-two percent of patients were referred to an ophthalmologist. Four percent were admitted and transferred to Sydney Eye Hospital. In those who were referred, 13% did not have records at the specified ophthalmologist, 24% were not recorded to which specialist they were referred and 26% had significantly different specialist opinion. **Conclusions:** More than half of ED ophthalmic presentations were for corneal trauma and only 22% of patients were referred to an ophthalmologist, while most were treated solely in the ED or referred to general practice. Potentially vision-threatening misdiagnoses included three cases of iritis, three of keratitis and two of retinal artery occlusion. ED diagnoses of corneal problems matched exactly with ophthalmic opinion. Interestingly, recording of the visual acuity occurred in only 27% of cases.



service. [6] Over half the patients were referred from GPs. The article did not closely examine the referrals made from general ED doctors; rather it focused on the mistakes made by referring GPs. It found that iritis and viral conjunctivitis were commonly misdiagnosed by primary care providers and that antibiotics were routinely over-prescribed.

This is the first Australian study of ophthalmic presentations to a general ED. Numerous areas were examined including the frequency of diagnoses, the range of conditions diagnosed, discharge status of each presentation and the diagnosis made by the ophthalmologist if the patient was seen regarding their presenting problem. Several further factors were determined, including the most common diagnoses in patients presenting to a general ED with ophthalmic problems; and the correlation between the diagnosis made in the ED and that of the ophthalmologist.

## Background

Patients with acute ocular and visual problems present to various settings: the general practitioner (GP), the optometrist, the emergency department (ED) of the local hospital and other locations. In a review of the literature, it was observed that approximately one percent of ED presentations were for visual or ophthalmic problems. [1-4]

Previous studies have attempted to show the presentation load at general hospitals. Edwards [1] in 1987 made epidemiological conclusions based on an English hospital on data over fifteen years old, but without correlation between ED diagnosis and ophthalmologist diagnosis. Voon *et al.* [2] reviewed ocular trauma presentations in a Singaporean general hospital over a three month period in 1997, with emphasis on epidemiology of the mechanism of injury rather than outcome. Sanchez *et al.* [3] studied the presentations to a Spanish general hospital over nine months with regard only to the epidemiology of the patients presenting. Nash *et al.* [4] presented data from a national database in the USA from 1993 on the epidemiology of ocular presentations to general hospitals, but with no regard to the outcomes or accuracy of diagnosis. One Australian study regarding the epidemiology of ophthalmic presentations, by Kumar *et al.*, [5] was based on patients who were seen during the daytime at a dedicated eye hospital ED in 2001.

A recent Australian article reviewed only the referrals made from primary health providers to a dedicated ophthalmic emergency

## Methods

Ethical approval for this study was gained through the Central Coast Area Health Service (CCAHS) Ethics Committee in September 2006. All presentation data were obtained by the Gosford ED Information Service from 1 January 2005 to 31 December 2005 inclusive. Using the International Classification of Disease system, patients presenting with ophthalmic or visual disturbance were included. All other presentations were excluded. Data were converted from the service's format to a Microsoft Access database and each patient's medical record was then retrieved by hand. The following data were then entered onto a standardised form: name, ED diagnosis, referral or admission outcome for that presentation, visual acuity (yes/no) and the name of the ophthalmologist to whom that patient was referred (if there was a referral).

In 41% of the presentations, no specific diagnosis was given by the ED doctor. Instead, a less specific symptom or finding was used. For the non-specific diagnoses by the ED, no mention of a differential diagnosis was made in the notes. Where a diagnosis was given, it was recorded as written by the ED doctor. There was only one data collector, who was not blinded to the study outcomes. All records of the patients referred to ophthalmologists were sought from the stated ophthalmologist (a total of five different area ophthalmologists). These were examined in each of the ophthalmic practices and the diagnoses added to the

standardised form. [7]

Seven patient records were unable to be obtained through the CCAHS as three patients' records were held at an offsite facility and four files were missing.

### Results

There were 509 ED ophthalmic presentations to the Gosford ED between the dates 1 January 2005 and 31 December 2005 inclusive. Of these, 360 were males and 149 were females.

In only 27% of presentations was the visual acuity recorded (including the phrase "vision normal").

Table 1 shows the most common diagnoses made by the ED doctors. Diagnoses of fewer than two cases are not shown. The most common diagnoses made were for corneal trauma, such as abrasion, chemical splash or foreign body (316 presentations, 62%).

**Table 1.** Commonest diagnoses made in ED for ophthalmic presentations, in absolute numbers.

Diagnosis	Absolute patient number (%)
Corneal foreign body	184 (36)
"Red eye" (non-specific)	69 (14)
Corneal abrasion	52 (10)
"Trauma to eye" (non-specific)	48 (9)
"Blurred vision" (non-specific)	25 (5)
Chemical splash in eye	23 (5)
"Inflamed eye" (non-specific)	21 (5)
Migraine	10 (2)
"Itchy Eye" (non-specific)	6 (1)
Herpes Zoster ophthalmicus	4 (<1)
Fractured orbit	4 (<1)
Subconjunctival haemorrhage	3 (<1)
"Discharging eye"(non-specific)	3 (<1)
Stye	4 (<1)
Penetrating eye injury	2 (<1)
"Blindness one eye" (non-specific)	2 (<1)
Iritis	2 (<1)
Scleritis	2 (<1)
<b>Total</b>	<b>464 (91)</b>

Table 2 summarises the destinations for all the patients. Most patients were deemed well enough to be discharged as 'treatment complete,' or to be reviewed by the local GP or back at ED. Those transferred to Sydney Eye Hospital were for one case of endophthalmitis and three cases of penetrating eye globe injury.

One hundred and ten patients of the 509 were referred for ophthalmic opinion. In 26 of those 110, the patients' notes do not show to which specialist they were sent, simply "referred to ophthalmologist." A further fourteen patients of these 110 have no record of being seen at the ophthalmic practice to which they were referred.

The differing diagnoses between ophthalmologists and ED doctors are listed in Table 3. All 39 ED diagnoses of corneal pathology concurred with the ophthalmologist opinions (in traced records).

### Discussion

Gosford ED is staffed by doctors in various stages of training. Most are post-graduate year one and two; that is, interns and residents. In this survey, the level of experience of the doctor was not recorded. It may be interesting in future studies to observe if note-keeping and accuracy

**Table 2.** ED departure status of patients with ophthalmic presentations, in absolute numbers.

Departure Status	Absolute patient number (%)
Discharged treatment complete	165 (32)
Discharged with referral to ophthalmologist	110 (22)
Discharged to GP	95 (19)
Discharged with review in ED	85 (17)
Uncertain outcome	17 (3)
Admitted under ophthalmologist	13 (3)
Patient record unavailable	7 (1)
Referred to maxillofacial surgeon	5 (1)
Admitted under ophthalmologist and transferred to Sydney Eye Hospital	4 (<1)
Admission under paediatrician	3 (<1)
Referred to neurologist	2 (<1)
Admission under ENT	1 (<1)
Admission under physician	1 (<1)
Patient left ED before attendance	1 (<1)
<b>Total</b>	<b>509</b>

**Table 3.** Differing diagnoses between ED staff and ophthalmologists.

Ophthalmologist Diagnoses (with number)	ED Diagnosis
Vitreous detachment (2)	
Chronic dacryocystitis (1)	
Cataract (2)	
Corneal foreign body (1)	
Lacrimal duct obstruction (1)	"Painful eye"
Conjunctivitis (2)	
Corneal abrasion (1)	
Herpes Zoster ophthalmicus (1)	
Keratitis (1)	
Iritis (3)	"Blurred vision"
Dendritic keratitis (2)	"Painful eye" (1) and Herpes Zoster
Retinal artery occlusion (2)	Blurred vision (1) and "blindness one eye"
Keratoconjunctivitis (1)	Iritis
Branch vein occlusion (1)	Migraine
Ischaemic optic neuropathy (2)	"Blindness one eye" (1) and migraine

of diagnosis differ between ED doctors of different clinical training.

Presentations to a general district hospital for ophthalmic problems were primarily for acute issues, corneal trauma accounting for the majority of cases. This is in keeping with observations made by Nash *et al.* [3] and Sanchez *et al.* [4]

A limitation of the study is that for all the presentations that were not referred to ophthalmologists, there was no way of checking accuracy of diagnosis. This should be addressed in future studies, preferably prospectively.

### Conclusions

Superficial ophthalmic trauma is a very common ED presentation. For those patients referred to an ophthalmologist whose records can be traced, it appears that the majority were appropriately directed. The data shows that the ED doctors were more accurate in diagnosing corneal and eyelid problems than uveal, vitreous and retinal problems. Vision should be recorded in every patient who presents with visual or ocular symptoms. All referrals should be documented specifically and clearly.

### Conflict of interest

None declared.

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### Authors' Contributions

Rabin Bhandari collected the data and wrote the background, methods and results. Dr. Smith and Rabin Bhandari contributed equally to the discussion and conclusions.

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