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Original Article

Implementation and evaluation of an ophthalmic nurse practitioner emergency eye clinic

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Abstract

Background: To describe the implementation and assess the efficacy of an ophthalmic nurse practitioner (ONP) emergency eye clinic.

Methods: In a 13-month period, patients were assessed in an ONP emergency eye clinic in a teaching hospital setting. The ONP clinic was run on a defined scope of practice. Risk assessment was carried out in two audit sessions, 4 weeks duration each, at months 1 and 7. Patient outcomes were monitored for reattendance to the department following discharge.

Results: A total of 259 patients were assessed, 143 (55.2%) were within the scope of practice. In the two audit periods, concordance with the ophthalmologist was high, diagnosis 100% and management 95.2%. Many patients assessed (111, 42.9% of total) had minor external eye conditions – chiefly corneal foreign body or abrasion ($n = 50$), conjunctivitis ($n = 14$) and minor (non-alkali) chemical injuries ($n = 11$). No reattendance was noted in these patients when monitored for a mean of 12 months (range 7–19 months).

Conclusions: This study demonstrates the safety and effectiveness of an ONP emergency eye clinic when practising within a defined scope of practice. An ONP-led emergency eye clinic is a viable addition to acute ophthalmic eye care in Australia.

Key words: emergency service, ophthalmic nurse practitioner, primary nursing care, triage.

Introduction

The ophthalmic nurse practitioner (ONP)-led clinic can provide an efficient, cost-effective and high-standard alternative pathway to care for patients with a variety of ophthalmic conditions.[1–4] The role of the ONP in an acute care setting has a 15-year history in the UK.[5] In comparison, this autonomous nursing role has only been recently introduced in Australia with the appointment of an ONP to the Ophthalmology Department at Flinders Medical Centre, Adelaide, South Australia in 2003. Following this appointment, an ONP emergency eye clinic was established. Herein we describe its implementation, and the evaluation of the effectiveness and safety of this clinic.

The clinic was established to increase the capacity of the clinical service. By using an ONP to lead the emergency eye clinic, ophthalmologists were released for other duties for which their high levels of training were more appropriate. They were released to run consultative clinics and perform surgery.

With any change in the method of service delivery there is a need to demonstrate that there is no decrease in the quality of the clinical services provided by examining the accuracy of diagnoses and the effectiveness of treatment by continuous audit. To achieve this we compared the pattern of the ONP-led service with that provided by ophthalmologists in the same clinical situation.

Methods

A prospective study of 259 consecutive new patients attending an ONP emergency eye clinic over a period of 13 months was carried out at Flinders Medical Centre. This is a university-based teaching public hospital servicing the southern areas of Adelaide and South Australia with an estimated catchment population of 330 000. Referrals to the clinic originated from a wide range of services including general practitioners, optometrists, and the hospital general accident and emergency service. The tenets of the Declaration of Helsinki were followed and the study gained approval from the University ethics committee. The ONP-led clinic was conducted half a day per week. The scope of practice of

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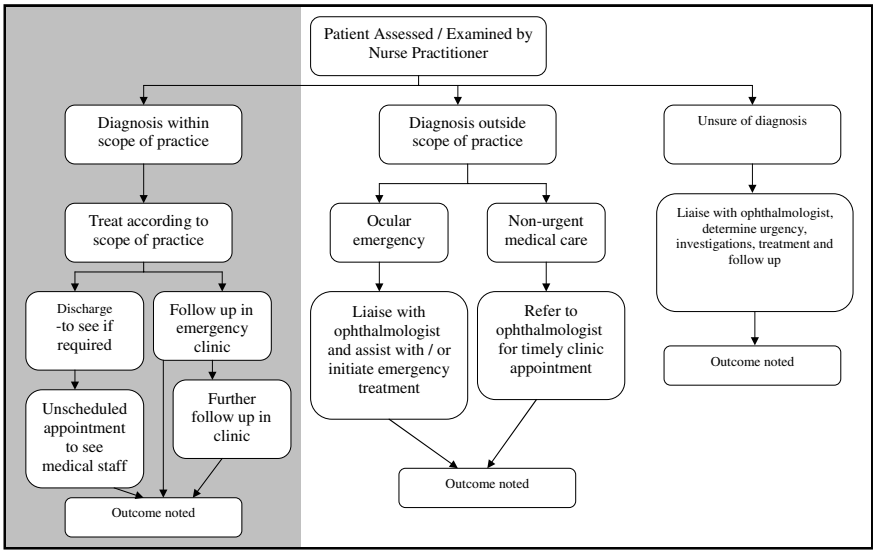

Figure 1. Ophthalmic nurse practitioner emergency eye clinic patient care flowchart. All paths lead to 'outcome noted' because the process is under ongoing audit for safety and outcome. This also provides a feedback loop for ongoing nurse practitioner education. (■) Nurse practitioner only; (□) nurse practitioner and ophthalmologist.

the nurse practitioner was defined and things beyond the scope of the defined practice were referred into subspecialty ophthalmology clinics (Fig. 1).

Scope of practice

The diagnosis and management of common eye conditions was incorporated within the ONP scope of practice as defined by the senior ophthalmology staff (Table 1). This process was approved by the Nurses Board of South Australia in conjunction with the authorization as a nurse practitioner. The South Australian Department of Health approved the clinical privileges. Vicarious liability is covered by the institution of employment and by the Department of Health Professional Indemnity and Insurance Program while working within the scope of practice as a nurse practitioner. To facilitate with the continuity of care, the defined scope of practice also included administering ophthalmic medication (Table 2) and requesting laboratory investigations (Table 3). With postgraduate studies in pharmacology and extensive anterior segment training, the scope of practice extended to include administering topical steroids within agreed clinical situations and acquiring/ordering corneal scrapes for herpes simplex and microbial analysis.

Examination

The examination and assessment techniques utilized by the ONP were indicated by the patient's history, symptoms or clinical signs. The minimum assessment of all patients consisted of a detailed history, logMAR visual acuity and a slit-lamp examination of the anterior segment. Additional assessment included intraocular pressure measurement with Goldmann tonometry, refraction, colour vision with Ishihara plates, assessment of extraocular movements, visual fields to confrontation and indirect ophthalmoscopy examination using a 90 D and/or 28 D lens. Following assessment, the patient was treated if within the allocated scope of practice, or a review by the medical staff was requested (Fig. 1).

Table 1. Ophthalmic nurse practitioner scope of practice

Assessment and treatment of:
Trichiasis
Corneal foreign body
Conjunctival/subconjunctival/subtarsal foreign bodies
Dry eye
Subconjunctival haemorrhage
Allergic conjunctivitis
Chlamydial conjunctivitis
Viral conjunctivitis
Bacterial conjunctivitis
Contact lens-related abrasion
Blepharitis
Chalazion – including incision and curettage
Ultraviolet radiation burn
Corneal/conjunctival abrasion
Removal of lid/conjunctival/corneal sutures
Episcleritis
Assessment, commence treatment and/or refer:
Posterior vitreous detachment
Mild chemical injuries*
Blunt ocular trauma
Conjunctival laceration
Acute glaucoma
Herpes simplex keratitis (dendritic ulcer)
Iritis
Marginal keratitis
Diplopia

*Mild chemical injury <grade 1 according to Roper-Hall[6] and not alkali.

Risk management strategies

Built-in specific risk management strategies were introduced at the commencement of the ONP-led clinic to identify and

Table 2. Medications approved for examination and nurse-initiated treatment

G. Minims fluorescein sodium 2.0% and rose Bengal 1.0%
Subcutaneous xylocaine 1% with adrenaline 1:100 000
G. Tropicamide 0.5% and 1.0%
G. Amethocaine 0.5 and 1.0%
G. Liquifilm
Oc. Lacri-Lube
G. Prednisolone sodium phosphate 0.5% (Predsol)
G. Flurometholone acetate 0.1% (Flarex)
G. Cyclopentolate 1%
G. Chloramphenicol 0.5% and Oc. Chloramphenicol 0.1%
Intravenous and oral acetazolamide (Diamox) 250 and 500 mg

Table 3. Laboratory tests approved for ophthalmic nurse practitioner ordering

Conjunctival swabs/scrapes
Bacterial culture and sensitivity
Viral culture and polymerase chain reaction
Chlamydia culture and polymerase chain reaction
Corneal scrapes for herpes simplex and microbial analysis

monitor safe practice as well as to detect suboptimal outcomes. The evaluation of the clinic was carried out over a period of 4 weeks on two separate occasions. The patients were assessed by the ONP and the treatment was initiated along defined lines. These patients were then seen by an ophthalmologist, who was masked to the diagnosis and management regime determined by the ONP. The diagnoses and treatment plans were compared. These two risk management periods are documented in this article.

In the event of a medical or ophthalmic emergency, medical personnel in concurrently running clinics within the department were available for patient management. Patient education and health promotion was incorporated into each clinic visit. This included adverse reactions to medications, and ocular signs and symptoms that may suggest deterioration in their ocular status. Patients were given the Ophthalmology Outpatient Clinic phone number to contact if there were any concerns. This is diverted to Flinders Medical Centre switchboard out of hours with emergency cover provided by the ophthalmology on-call staff.

Results

During the 13-month pilot study in which 259 patients were seen by the ONP, 143 were treated solely by the ONP, and 116 were outside the ONP scope of practice. The age of the patients seen ranged from 3 to 93 years and the major referral sources were the accident and emergency department of the general hospital from where 99 patients (38.2%) came, and general practitioners from where another 80 patients (30.8%) originated. Other referrals included patients who were already being seen in other specialist departments or self-referrals. A total of 37 patients were considered to be self-referrals (14.2%) and there were inpatient referrals from the hospital wards in 35 cases (13.4%), and a small number of patients, 8 (3.1%), came from optometrists. Four clinics were conducted during the first and second evaluation periods. During these, 41 patients were examined independently by the nurse practitioner and by an ophthalmologist (Table 4). A high concordance of diagnoses was achieved with 100% agreement between the ONP and the ophthalmologist. With regard to the treatment plan a high concordance was also achieved with 95.2% agreement between the ONP and the ophthalmologist. There was only one exception where the ophthalmologist wished to use a bandage contact lens for a corneal abrasion whereas the ONP preferred simple patching.

Table 4. Patient assessment by ophthalmic nurse practitioner and ophthalmologist during two assessment periods

Diagnosis	Period 1 ($n = 21$)	Period 2 ($n = 20$)
Mild chemical injury	2	2
Corneal foreign body	6	7
Trichiasis	2	1
Conjunctivitis	3	4
Dry eye	1	0
Chalazion	2	2
Episcleritis	1	0
Subconjunctival haemorrhage	1	0
Corneal abrasion	3	3
Blepharitis	0	1

The list and range of ocular conditions that the ONP assessed and treated is listed in Table 5. In total, 111 (42.9% of total) patients had minor external eye conditions: corneal or conjunctival foreign bodies, corneal or conjunctival abrasions, conjunctivitis, minor chemical burns (<grade 1,[6] and non-alkali), lid infections or other minor external eye disease. The outcome is also summarized in Table 5. Patients were treated and discharged or referred to the ophthalmology outpatient clinic for follow up once the treatment had commenced.

A total of 30 patients were examined, diagnosed and commenced on treatment by the ONP, then referred on to the ophthalmology outpatient clinic for follow up. A concordance rate of 100% in diagnosis was noted when assessed by specialist staff. The outcomes of patients assessed by the ONP were ascertained by monitoring the patient until the clinical problem was completely resolved. No adverse reactions and no additional clinical appointments were recorded for the patients independently seen by the ONP with a mean follow-up period of 12 months (range 7–19 months).

Discussion

These results indicate that an ONP-led emergency eye clinic can operate with accuracy comparable to that of ophthalmologists. The results are in concordance with other studies

Table 5. Outcome for the 143 patients treated solely by the ophthalmic nurse practitioner

Eye condition	No.	Outcome
Foreign body (cornea or conjunctival)	36	Discharged
Corneal/conjunctival abrasion	14	Discharged
Conjunctivitis	14	Discharged
Chemical burn (<grade I)[6]	11	Discharged
Household cleaner	5	
Detergent	4	
Glue	2	
Incision and curettage chalazion	10	Discharged
Dry eye	8	Discharged
Iritis	8	Referred to clinic for f/u
Retinal screening posterior vitreous detachment	7	Referred to clinic for f/u
Trichiasis	7	Discharged
Blepharitis	5	Discharged
Marginal keratitis	4	Referred to clinic for f/u
Blunt ocular injury	4	Referred to clinic for f/u
Welding flash	3	Discharged
Subconjunctival haemorrhage	3	Discharged
Lagophthalmos	2	Referred to clinic for f/u
Exposure keratopathy	2	Referred to clinic for f/u
Refractive error	2	Discharged to optometrist
Episcleritis	1	Referred to clinic for f/u
Cataract	1	Referred to clinic for f/u
Conjunctival laceration	1	Referred to clinic for f/u

f/u, follow up.

elsewhere. Nurse practitioners have played an important role in recent times both in North America and Europe, particularly the UK.[1,5,7] These results suggest a way of expanding the ophthalmic workforce and increasing access to emergency eye care.

In total, 43% of patients had minor external eye conditions that were safely treated by the nurse practitioner without need for ophthalmologist assessment or unplanned reattendance. This is comparable to rates of minor external eye disease presenting in ophthalmic accident and emergency clinics elsewhere,[8] and to rates of satisfactory ONP diagnosis and treatment in an ophthalmic accident and emergency department in England.[9] As this was a clinic of one session per week, expansion of the service to five sessions per week has the potential to release our ophthalmologists from 700 cases of minor external eye diseased easily managed by an ONP over a 12-month period.

The design of the present study was to assess the safety and effectiveness of a nurse-led clinic. One of the main attractions of nurse-led clinics is cost-effectiveness when compared with medical-led clinics. This key determinant of cost-effectiveness is the practitioner's salary, but time taken when consulting, costs of further clinical investigations and cost of consumables also have an impact. Junior medical staff largely operate emergency eye clinics within public hospitals in Australia. Therefore, the salary for the ONP may be more than the junior registrar who would otherwise perform the same role. However, a nurse practitioner may be more familiar in the specific clinic environment and more experienced in managing patients with ophthalmic conditions. Therefore, the average time for a consultation may be shorter without sacrificing the patients' quality of care. Similarly, the experienced ONP may be more efficient and use less consumables and order less investigations. On balance it is likely that the two models have a similar cost-effectiveness. However, for this to be assessed fully an additional specific study is required.

The effectiveness of nurse practitioners, in common with other clinicians, is very much related to the effectiveness of the individual and the conditions under which they work. It is necessary and important for there to be effective protocols that are rigidly adhered to. This will also increase the safety and effectiveness of nurse practitioners, just as it would increase the effectiveness of medical staff if they were subjected to evidence-based practice plans. Furthermore, it is vital that these protocols are reviewed regularly as the skills of the ONP develop, and as practice evolves.

The ONP, with specialist training and concise protocols, can provide an important role in the triage, assessment and management of emergency eye patients and to reduce the routine workload of ophthalmologists. The concept of this type of clinic can be adapted and implemented in other ophthalmology departments to improve the efficiency of public health service delivery.

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