

Education and Training of Referring Physicians Decreases At-Home Call Demand

ABHISHEK K. NEMANI, MD

WILLIAM D. GRANT, EdD

LÉON-PAUL NOËL, MD

Abstract

Background Excessive, sometimes unnecessary consultation challenges the ophthalmology resident's ability to obtain adequate rest and personal time while taking at-home calls. Basic training of nonophthalmologists in assessing and treating common ophthalmic emergencies offers a potential solution to this problem by providing primary caregivers the knowledge base, tools, and confidence to manage them independently.

Objective We measured ophthalmic consultation requests at a large teaching institution and the impact of an educational intervention on the number and type of requests.

Methods During a 31-day period in 2009 all requests for urgent ophthalmic consultation were logged and characterized by reason, urgency, and source of the call. A 3-part educational intervention was targeted to residents and attending physicians in the departments of emergency medicine (half-day lecture and practice), anesthesiology (grand rounds lecture), and

otolaryngology (guidelines for traumatic orbital fractures). Six months later we conducted a 26-day call log to evaluate the impact.

Results Pre intervention, we received 63 total and 56 after-hours calls for urgent ophthalmic consultation as compared to 39 total and 35 after-hours calls post intervention. Ophthalmology residents reported seeing more urgent and fewer nonessential consultations in the postintervention period, and there was greater agreement between calling physicians' initial diagnosis and consulting physicians' final diagnosis. No adverse patient outcomes occurred as a result of the change in practices.

Conclusion Basic education of nonophthalmologists in ophthalmic diagnostic and treatment concepts, through relatively brief educational interventions, was associated with a decrease in total consultation requests and more appropriate consultations in this pilot study at a single institution.

Introduction

The appropriateness of request for ophthalmic consultation is a common medical problem,¹ which has taken on greater relevance with changes in resident training during the last decade. From retrospective review of outpatient, inpatient, and emergency room referral data, previous authors¹⁻⁵ have demonstrated the need for more efficient use of ophthalmic consultation, citing inadequate screening evaluation by nonophthalmologists as the major contributing factor

leading to unnecessary referral. The need to address this concern is especially important for ophthalmology residency training in an era of increasing duty hour limits.

Previous studies of ophthalmic referral patterns have suggested that basic training of nonophthalmologists in the assessment of visual acuity and ocular health would result in more efficient use of specialist resources and less nonessential consultation of on-call ophthalmologists.²⁻⁵ To date no study has described the implementation of such educational measures and their effect on ophthalmic consultation.

We studied whether a simple educational intervention would impact the number and type of on-call ophthalmologic consultations, with a focus on reducing the ophthalmologic resident at-home call burden and postcall fatigue.

Methods

We evaluated after-hours, weekend, and holiday consultation requests made to the Department of Ophthalmology at SUNY Upstate Medical University in Syracuse, New York,

All authors are at SUNY Upstate Medical University at Syracuse. **Abhishek K. Nemani, MD**, is postgraduate year-3 Ophthalmology Resident; **William D. Grant, EdD**, is Professor of Emergency Medicine; **Léon-Paul Noël, MD**, is Director Ophthalmology Residency Training, Professor of Ophthalmology and Pediatrics.

Funding: The authors report no external funding source for this study.

Corresponding author: Abhishek K. Nemani, MD, 115 Solar Street, Apartment 300, Syracuse, NY 13204, 607.768.3612, NemaniA@upstate.edu

Received December 18, 2011; revisions received May 21 and July 2, 2012; accepted July 17, 2012.

DOI: <http://dx.doi.org/10.4300/JGME-D-11-00317.1>

TABLE 1 ORBITAL FRACTURE GUIDELINES

Urgent ophthalmic consultation recommended if any one of the following are present on examination:

1. Visual acuity less than 20/50
2. Obvious globe penetration or eyelid laceration
3. Pupil irregularity
4. 360° of subconjunctival hemorrhage
5. Orbital emphysema resulting in marked proptosis
6. CT scan evidence of globe deformity and/or bony impingement of the optic nerve

Abbreviation: CT, computed tomography.

a major teaching institution composed of 3 separate, physically interconnected hospitals. This network services an immediate metropolitan population of 450 000 and covers a regional service area of 1 million people.

We logged all requests for urgent ophthalmic consultation by providers practicing within our hospital network between August 28 and September 27, 2009. For each call received by the ophthalmology resident on call, the resident recorded time of request, the physician requesting consultation, suspected diagnosis by primary provider, duration of consultation, sense of urgency in the opinion of the consulting ophthalmology resident, final diagnosis, and ultimate treatment provided. From this log, we identified the major sources of “after-hours” calls (calls made between 6:00 PM and 8:00 AM during the week, weekend calls from 6:00 PM Friday until 8:00 AM the following Monday, and calls made during a 24-hour observed holiday period). From our findings, we introduced 3 separate educational measures directed towards the largest requesters of urgent ophthalmic consultation, with the aim of decreasing the number of after-hours consultations. Our first intervention consisted of 2 half-day training sessions in which ophthalmology residents discussed the evaluation, diagnosis, and management of commonly encountered ocular emergencies with emergency medicine residents and attending physicians in a lecture format, followed by a hands-on tutorial demonstrating correct use of the ophthalmic slit-lamp. Our second intervention was a grand rounds presentation to the department of anesthesiology, focusing on perioperative ophthalmic care and the treatment of common anesthesia-related ocular complications in the immediate postoperative period, attended by anesthesiology residents and attending physicians. The PowerPoint (Microsoft, Redmond, WA) presentations for both are available from author. Our final intervention consisted of a set of guidelines (TABLE 1) addressing the management of traumatic orbital fractures, which were introduced to the

department of otolaryngology to outline when urgent ophthalmic consultation should be sought in the assessment of orbital fractures not needing immediate surgical attention. The guidelines were developed with our oculo-plastics faculty, based on community standard of care practices.

Six months later, we conducted a second call log from April 1 to April 26, 2010, recording the same information as in our first call log. This primarily consisted of consultations requested by residents and attending physicians who had participated in the educational interventions described.

We determined that Institutional Review Board approval was not required for this resident quality assurance study.

The 2 data sets were entered into an Excel spreadsheet (Microsoft, Redmond, WA) with descriptive and test of proportions statistical analysis performed using MedCalc version 12.2.1 (MedCalc Software, Mariakerke, Belgium) and compared. Significance was set at $P < .05$.

Results

Our preintervention call log included 31 consecutive days, 5 weekends, and 1 holiday (Labor Day). During this period, residents received 63 total calls for urgent ophthalmic consultation, 56 of which were after-hours. Each of the 56 consultations, per department policy, required comprehensive dilated ophthalmic examination with a slit-lamp and indirect ophthalmoscope when possible. Residents spent an average of 45 minutes per consultation, not including travel time, and were called in from home, on average, 1.87 times per shift. The total number of calls per shift ranged from 0 to 5, with most calls coming from emergency medicine, otolaryngology, and anesthesiology.

In the opinion of the consulting ophthalmology resident, 20 (35.7%; $z = 6.41$; $P < .001$; 95% confidence interval [CI], 23.3%–49.6%) of the 56 after-hours consultations were considered nonurgent and could have been referred to the outpatient ophthalmology clinic to be seen during regular clinic hours the following day. It was felt that 12 (21.4%; $z = 2.84$; $P < .004$; 95% CI, 11.6%–34.4%) of the 56 after-hours consultations could have been easily treated by the requesting physician alone, without the presence of an ophthalmology resident. Less than one-half (42.9%; $z = 8.2$; $P < .001$; 95% CI, 29.7%–58.8%) of the after-hours consultations were actually considered urgent. Examples of both can be found in TABLE 2.

Comparison of requesting physician’s initial diagnosis and consulting physician’s final diagnosis revealed agreement in 20 cases (35.7%) and disagreement in 16 cases (28.6%) and partial agreement in the remaining 20 cases (35.7%).

TABLE 2 FIVE MOST FREQUENTLY ENCOUNTERED OPHTHALMIC CONDITIONS UPON CONSULTATION BY URGENCY		
Urgent	Not Urgent	Treatable by Calling Physician
Eyelid laceration	Nontraumatic cataract	Chemical exposure
Hyphema	Dry eye	Conjunctivitis
Iritis	Monocular diplopia	Corneal abrasion
Retinal vascular occlusion	Refractive error	External foreign body
Ruptured globe	Visually asymptomatic orbital fracture	Subconjunctival hemorrhage

The total number of all urgent ophthalmic consultation calls (63 down to 39) and the number of after-hours calls (56 down to 35) decreased for the postintervention log period, which encompassed 26 consecutive days, 4 weekends, and 1 observed holiday (Easter). Residents again spent an average of 45 minutes per consultation, travel time excluded, and were called in from home during the preintervention phase 1.87 times per shift versus 1.26 average all-ins per shift post intervention ($P < .05$).

Further comparisons of preintervention and postintervention call data showed no statistically significant differences: nonurgent consultations were 37.5% in the pre-education phase and 28.6% in the posteducation phase; the percentage of patients with conditions evaluated to be easily treatable by the requesting physician alone was 21.4% and 11.4%, respectively; and the proportion of patients with actual urgent ophthalmic problems was 42.6% and 60.0%, respectively. Comparison of initial and final diagnoses in the preintervention to postintervention periods showed an increase in agreement (35.7% versus 42.9%) and reduction in disagreement (28.6% versus 25.7%). These differences were not statistically significant.

Discussion

Comparison of our preintervention and postintervention data showed an objective decrease in the number of total and after-hours calls received, and suggested a possible improvement in the appropriateness of the consultations requested. While a search of the literature revealed no comparable studies in ophthalmology, other authors⁷ have similarly demonstrated the utility of cross-discipline educational interventions in improving primary care residents' abilities to successfully manage specialty-specific conditions such as skin cancer.

Our study has several limitations, including the timing of data collection. Preintervention data were collected early in the academic year when newly appointed residents had just begun their training, and many of the calls received in our preintervention data set may have come from residents whose experience in managing ocular complaints was

limited. A second limitation is that our postintervention call log consisted of 5 fewer days including 1 less weekend than our preintervention call log. While care was taken to ensure that a sufficient amount of time had elapsed since introduction of our educational measures and that similar climatic conditions existed between the 2 periods to account for seasonal variation, exactly the same duration of time for each log was not achieved. Finally, no power calculation was made before the study. The educational intervention may have been too weak (ie, small effect size) in its impact on many outcomes, and/or the small sample may have accounted for the lack of statistical significance seen in some of the outcome measures.

With fewer calls in the postintervention period for urgent ophthalmic consultation, it is important to note that no clinically adverse visual outcomes or events occurred for any of the patients seen in follow-up at our outpatient clinics. All patients referred for next-day follow-up appeared to have been appropriately cared for by their primary providers either in the emergency department or hospital, lending further validity to our interventional measures from a patient care standpoint. Had there been any adverse outcomes, they would have been used as the basis for case analysis and discussion of trigger events to avoid at our weekly morbidity and mortality conference.

As a first effort to address current practice inefficiencies, we chose number of visits as our outcome measure. Changes in knowledge, skills, and behaviors of the physicians involved in our study as a result of our interventions are our next line of inquiry. While no objective acceptability or feasibility measures were sought, the interventions appeared to be well received and have been continued since with few resources as part of the usual resident teaching time.

Conclusions

Basic education of nonophthalmologists in ophthalmic diagnostic and treatment concepts, through 3 brief cross-discipline educational interventions, was associated with a decrease in total consultation requests and an

increase in preconsultation and postconsultation agreement on diagnosis in this pilot study at a single institution.

References

- 1 Ezra DG, Mellington F, Cugnoni H, Westcott M. Reliability of ophthalmic accident and emergency referrals: a new role for the emergency nurse practitioner? *Emerg Med J*. 2005;22(10):696–699.
- 2 Flitcroft DJ, Westcott M, Wormald R, Touquet R. Who should see eye casualties: a comparison of eye care in an accident and emergency department with a dedicated eye casualty. *J Accid Emerg Med*. 1995;12(1):23–27.
- 3 Joshi RS. Study of referral pattern to ophthalmology outpatient department from various departments in the medical college. *J Indian Med Assoc*. 2011;109(2):79–81, 92.
- 4 Schachat AP, McDonnell PJ, Petty BG, Jampel HD, Patel A, Wittpenn JR, et al. Ophthalmology consultations at a large teaching hospital. *Metab Pediatr Syst Ophthalmol*. 1989;12(4):105–109.
- 5 Tan MMS, Driscoll PA, Marsden JE. Management of eye emergencies in the accident and emergency department by senior house officers: a national survey. *J Accid Emerg Med*. 1997;14:157–158.
- 6 Gerbert B, Bronstone A, Wolff M, Maurer T, Berger T, Pantilat S, et al. Improving primary care residents' proficiency in the diagnosis of skin cancer. *J Gen Intern Med*. 1998;13(2):91–97.